Logic Selection Guide

July 1999

LOGIC SELECTION GUIDE

JULY 1999

TEXAS INSTRUMENTS

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Texas Instruments (TI™) offers a full spectrum of logic functions and technologies from the mature to the advanced, including bipolar, BiCMOS, and CMOS. TI's process technologies offer the logic performance and features required for the most modern logic designs, while maintaining support for more traditional logic products. TI's offerings include products in the following process technologies or device families:

- AC, ACT, AHC, AHCT, ALVC, AVC, FCT, HC, HCT, LV, LVC, TVC

- ABT, ABTE, ALB, ALVT, BCT, HSTL, LVT, SSTL

- BTA, CBT, CBTLV, FB, FIFO, GTL, JTAG

- ALS, AS, F, LS, S, TTL

TI offers specialized, advanced logic products that improve overall system performance and address design issues, including testability, low skew requirements, bus termination, memory drivers, and low-impedance drivers.

TI offers a wide variety of packaging options, including advanced surface-mount packaging, such as the plastic thin quad flatpack (TQFP), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), thin very small-outline package (TVSOP), and MicroStar BGA™ low-profile fine-pitch BGA (LFBGA) package. These packages deliver high performance and allow the designer to double input/output density in the same circuit board area or to reduce the board area by one-half, compared to standard packaging technology.

For further information on TI logic families, refer to the list of current TI logic technical documentation provided in this preface. For an overview of TI logic, see Section 1. Sections 2, 3, and 4 contain a functional index, functional cross-reference, and device selection guide, respectively. These sections list the functions offered, package availability, and applicable literature numbers of current data sheets (as of Logic Selection Guide publication date). Appendix A contains a list of orderable devices formerly offered by Harris Semiconductor. Data sheets can be ordered through your local sales office or TI authorized distributor, or downloaded from the internet at http://www.ti.com. Please see the back cover of this selection guide for additional information.

CURRENT TI LOGIC TECHNICAL DOCUMENTATION

Listed below is the current collection of TI logic technical documentation. These documents can be ordered through a TI representative or authorized distributor by referencing the appropriate literature number.

Document	Literature Number
ABT Logic Advanced BiCMOS Technology Data Book (1997)	SCBD002C
AC/ACT CMOS Logic Data Book (1997)	SCAD001D
Advanced Bus-Interface SPICE I/O Models Data Book (1995)	SCBD004A
AHC/AHCT Logic Advanced High-Speed CMOS Data Book (1997)	SCLD003A
AHC/AHCT Designer's Guide (September 1998)	SCLA013A
ALS/AS Logic Data Book (1995)	SDAD001C
ALVC Advanced Low-Voltage CMOS Data Book (June 1999)	SCED006A
BCT BiCMOS Bus-Interface Logic Data Book (1994)	SCBD001B
Boundary-Scan Logic IEEE Std 1149.1 (JTAG) Data Book (1997)	SCTD002A
IEEE Std 1149.1 (JTAG) Testability Primer (1997)	SSYA002C
CBT (5-V) and CBTLV (3.3-V) Bus Switches Data Book (1998)	SCDD001B
Design Considerations for Logic Products Application Book (1997)	SDYA002
F Logic Data Book (1994)	SDFD001B
GTL, BTL, and ETL Logic Data Book (1997)	SCED004
HC/HCT Logic High-Speed CMOS Data Book (1997)	SCLD001D
LVC and LV Low-Voltage CMOS Logic Data Book (1998)	SCBD152A
LVT Logic Low-Voltage Technology Data Book (1998)	SCBD154
Mobile Computing Logic Solutions Data Book (July 1999)	SCPD002
PC, Workstation, Server, and High-Speed Memory Interface Logic Solutions Data Book (July 1999)	SCPD003
Semiconductor Group Package Outlines Reference Guide (1998)	SSYU001D

See www.ti.com/sc/logic for the most current data sheets.

Example:

SN	74	LVC	H	16	2	244	A	DGG	R
1	2	3	4	5	6	7	8	9	10
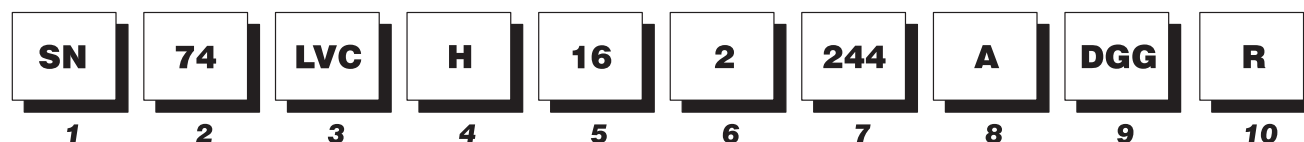
1   Standard Prefix

Example: SNJ – Conforms to MIL-PRF-38535 (QML)

2   Temperature Range

Examples: 54 – Military
                  74 – Commercial

3   Family

Examples: Blank – Transistor-Transistor Logic
                  ABT – Advanced BiCMOS Technology
                  ABTE – Advanced BiCMOS Technology/
                        Enhanced Transceiver Logic
                  AC/ACT – Advanced CMOS Logic
                  AHC/AHCT – Advanced High-Speed CMOS Logic
                  ALB – Advanced Low-Voltage BiCMOS
                  ALS – Advanced Low-Power Schottky Logic
                  ALVC – Advanced Low-Voltage CMOS Technology
                  AS – Advanced Schottky Logic
                  AVC – Advanced Very Low-Voltage CMOS Logic
                  BCT – BiCMOS Bus-Interface Technology
                  CBT – Crossbar Technology
                  CBTLV – Low-Voltage Crossbar Technology
                  F – F Logic
                  FB – Backplane Transceiver Logic/Futurebus+
                  GTL – Gunning Transceiver Logic
                  HC/HCT – High-Speed CMOS Logic
                  HSTL – High-Speed Transceiver Logic
                  LS – Low-Power Schottky Logic
                  LV – Low-Voltage CMOS Technology
                  LVC – Low-Voltage CMOS Technology
                  LVT – Low-Voltage BiCMOS Technology
                  S – Schottky Logic
                  SSTL – Stub Series-Terminated Logic
                  TVC – Translation Voltage Clamp Logic

4   Special Features

Examples: Blank = No Special Features
                  D – Level-Shifting Diode (CBTD)
                  H – Bus Hold (ALVCH)
                  R – Damping Resistor on Inputs/Outputs (LVCR)
                  S – Schottky Clamping Diode (CBTS)

5   Bit Width

Examples: Blank = Gates, MSI, and Octals
                  1G – Single Gate
                  8 – Octal IEEE 1149.1 (JTAG)
                  16 – Widebus™ (16, 18, and 20 bit)
                  18 – Widebus IEEE 1149.1 (JTAG)
                  32 – Widebus+™ (32 and 36 bit)

6   Options

Examples: Blank = No Options
                  2 – Series-Damping Resistor on Outputs
                  4 – Level Shifter
                  25 – 25-Ω Line Driver

7   Function

Examples: 244 – Noninverting Buffer/Driver
                  374 – D-Type Flip-Flop
                  573 – D-Type Transparent Latch
                  640 – Inverting Transceiver

8   Device Revision

Examples: Blank = No Revision
                  Letter Designator A–Z

9   Packages

Examples: D, DW – Small-Outline Integrated Circuit (SOIC)
                  DB, DL – Shrink Small-Outline Package (SSOP)
                  DBB, DGV – Thin Very Small-Outline Package (TVSOP)
                  DBQ – Quarter-Size Outline Package (QSOP)
                  DBV, DCK – Small-Outline Transistor Package (SOT)
                  DGG, PW – Thin Shrink Small-Outline Package (TSSOP)
                  FN – Plastic Leaded Chip Carrier (PLCC)
                  GKE, GKF – MicroStar BGA™ Low-Profile Fine-Pitch
                        Ball Grid Array (LFBGA)
                  N, NP, NT – Plastic Dual-In-Line Package (PDIP)
                  NS, PS – Small-Outline Package (SOP)
                  PAG, PAH, PCA, PCB, PM, PN, PZ –
                        Thin Quad Flatpack (TQFP)
                  PH, PQ, RC – Quad Flatpack (QFP)

10 Tape and Reel

Devices in the DB and PW package types include the R designation for reeled product. Existing product inventory designated LE may remain, but all products are being converted to the R designation.

Examples:

            Existing Nomenclature – SN74LVTxxxDBLE
            New Nomenclature – SN74LVTxxxADBR

              LE – Left Embossed (valid for DB and PW packages only)
              R – Standard (valid for all surface-mount packages)

There is no functional difference between LE and R designated products, with respect to the carrier tape, cover tape, or reels used.

† **See Appendix A for information on logic products formerly offered by Harris Semiconductor.**

LOGIC SYMBOLIZATION GUIDELINES

The logic symbolization guidelines are intended to minimize confusion concerning package symbolization on logic devices. Table 1 provides the user with a name rule and useful TI package designator information. Table 2 uses the name rule from Table 1 and applies it across all logic technology families.

Example: Suppose you have a 48-pin TVSOP with the symbolization VH***. Locate the 48-pin TVSOP (DGV) package in Table 1 and read across to the third column. Note that this package utilizes name rule C. Proceed to Table 2 and search down the *Name Rule C* column for VH***. The most complete device number, SN74ALVCH16***, is located in the *Name Rule A* column.

Table 1. Name Rule Decision Tree

PACKAGE	NO. OF PINS	NAME RULE	PACKAGE DESIGNATOR
LFBGA	96	C	GKE
	114	C	GKF
PDIP	8	A	P
	14, 16, 20	A	N
	24, 28	A	NP, NT
PLCC	28	A	FN
	44	B	FN
QSOP	16, 20, 24	B	DBQ
SOIC	1, 14, 16	B	D
	16, 20, 24, 28	B	DW
QFP	52	B	RC
	80	A	PH
	100, 132	A	PQ
SOP	8	C	PS
	14, 16, 20, 24	B	NS
SSOP	14, 16, 20, 24, 28, 30, 38	C	DB
	28, 48, 56	B	DL
TSSOP	8, 14, 16, 20, 24, 28	C	PW
	48, 56, 64	B	DGG
TVSOP	14, 16, 20, 24, 48, 56	C	DGV
	80, 100	B	DBB
TQFP	52	B	PAH
	64	B	PAG, PM
	80	B	PN
	100	B	PZ, PCA
	120	B	PCB

Table 2.   Typical Logic Package Symbolization Guidelines

NAME RULE A	NAME RULE B	NAME RULE C	NAME RULE A	NAME RULE B	NAME RULE C
74AC***	AC***	AC***	SN74ALVCH16***	ALVCH16***	VH***
74AC11***	AC11***	AE***	SN74ALVCH162***	ALVCH162***	VH2***
74ACT***	ACT***	AD***	SN74ALVCH32***	ALVCH32***	ACH***
74ACT1***	ACT1***	AU***	SN74ALVCHG16***	ALVCHG16***	VG***
74ACT11***	ACT11***	AT***	SN74ALVCHG162***	ALVCHG162***	VG2***
CD74HC***	HC***M	HJ***	SN74ALVCHR16***	ALVCHR16***	VR***
CD74HCT***	HCT***M	HK***	SN74ALVCHR162***	ALVCHR162***	VR2***
CD74AC***	AC***M	HL***	SN74ALVCHS162***	ALVCHS162***	VS2***
CD74ACT***	ACT***M	HM***	SN74ALVTH16***	ALVTH16***	VT***
SN64BCT***	DCT***	DT***	SN74ALVTH162***	ALVTH162***	VT2***
SN64BCT2***	DCT2***	DA***	SN74ALVTH32***	ALVTH32***	VL***
SN64BCT25***	DCT25***	DC***	SN74AS***	AS***	AS***
SN64BCT29***	DCT29***	DD***	SN74AS***	74AS***†	AS***
SN74ABT***	ABT***	AB***	SN74AVC***	AVC***	AVC***
SN74ABT***-S	ABT***-S	AB***-S	SN74AVC16***	AVC16***	CVA***
SN74ABT16***	ABT16***	AH***	SN74AVC32***	AVC32***	ACV***
SN74ABT162***	ABT162***	AH2***	SN74AVCH16***	AVCH16***	CVH***
SN74ABT18***	ABT18***	AJ***	SN74BCT***	BCT***	BT***
SN74ABT2***	ABT2***	AA***	SN74BCT11***	BCT11***	BB***
SN74ABT5***	ABT5***	AF***	SN74BCT2***	BCT2***	BA***
SN74ABT8***	ABT8***	AG***	SN74BCT25***	BCT25***	BC***
SN74ABTE16***	ABTE16***	AN***	SN74BCT29***	BCT29***	BD***
SN74ABTH***	ABTH***	AK***	SN74BCT8***	BCT8***	BG***
SN74ABTH16***	ABTH16***	AM***	SN74CBT***	CBT***	CT***
SN74ABTH162***	ABTH162***	AM2***	SN74CBT16***	CBT16***	CY***
SN74ABTH18***	ABTH18***	AL***	SN74CBT3***	CBT3***	CU***
SN74ABTR2***	ABTR2***	AR***	SN74CBT6***	CBT6***	CT6***
SN74AHC***	AHC***	HA***	SN74CBTD***	CBTD***	CD***
SN74AHC16***	AHC16***	HE***	SN74CBTD16***	CBTD16***	CYD***
SN74AHCH16***	AHCH16***	HH***	SN74CBTD3***	CBTD3***	CC***
SN74AHCT***	AHCT***	HB***	SN74CBTH16***	CBTH16***	CYH***
SN74AHCT16***	AHCT16***	HF***	SN74CBTLV16***	CBTLV16***	CN***
SN74AHCTH16***	AHCTH16***	HG***	SN74CBTLV3***	CBTLV3***	CL***
SN74AHCU***	AHCU***	HD***	SN74CBTS***	CBTS***	CS***
SN74ALB16***	ALB16***	AV***	SN74CBTS16***	CBTS16***	CYS***
SN74ALS***	ALS***	G***	SN74CBTS3***	CBTS3***	CR***
SN74ALVC***	ALVC***	VA***	SN74F***	F***	F***
SN74ALVC16***	ALVC16***	VC***	SN74F***	74F***†	F***
SN74ALVC162***	ALVC162***	VC2***	SN74HC***	HC***	HC***
SN74ALVCH***	ALVCH***	VB***	SN74HCT***	HCT***	HT***

† For NS package only

Table 2.   Typical Logic Package Symbolization Guidelines (continued)

NAME RULE A	NAME RULE B	NAME RULE C	NAME RULE A	NAME RULE B	NAME RULE C
SN74HCU***	HCU***	HU***	SN74LVCU***	LVCU***	LCU***
SN74LS***	LS***	LS***	SN74LVCZ***	LVCZ***	CV***
SN74LS***	74LS***†	LS***	SN74LVCZ16***	LVCZ16***	CW***
SN74LV***	LV***	LV***	SN74LVT***	LVT***	LX***
SN74LV***	74LV***†	LV***	SN74LVT***-S	LVT***-S	LX***-S
SN74LVC***	LVC***	LC***	SN74LVT162***	LVT162***	LZ***
SN74LVC16***	LVC16***	LD***	SN74LVT18***	LVT18***	T18***
SN74LVC2***	LVC2***	LE***	SN74LVT2***	LVT2***	LY***
SN74LVC4***	LVC4***	LJ***	SN74LVTH***	LVTH***	LXH***
SN74LVC8***	LVC8***	LC8***	SN74LVTH16***	LVTH16***	LL***
SN74LVCC3***	LVCC3***	LH***	SN74LVTH162***	LVTH162***	LL2***
SN74LVCC4***	LVCC4***	LG***	SN74LVTH2***	LVTH2***	LK***
SN74LVCH***	LVCH***	LCH***	SN74LVTR***	LVTR***	LXR***
SN74LVCH16***	LVCH16***	LDH***	SN74LVTT***	LVTT***	LXT***
SN74LVCH162***	LVCH162***	LN2***	SN74LVTZ***	LVTZ***	LXZ***
SN74LVCH32***	LVCH32***	CH***	SN74LVU***	LVU***	LU***
SN74LVCHR162***	LVCHR162***	LR2***	SN74S***	S***	S***
SN74LVCR2***	LVCR2***	LER***	SN74S***	74S***†	S***

† For NS package only

DCK and DBV 5-Pin SOT Packages

The DCK (PicoGate Logic) and DBV (Microgate Logic) 5-pin packages are very small and have space for only three or four symbolization characters. The format of the characters is 1, 2, 4, or 1, 2, 3, 4 where:

PACKAGE	DCK	DBV	TABLE
Device technology	1	1	See Table 1
Device function	2	2, 3	See Table 2
Wafer fabrication/assembly test site code	3	4	

Tables 3 and 4 list the possible device technology and function codes for the 5-pin packages. In some cases, the tables may list a device technology or function that is not yet available. The wafer fabrication and assembly-test site is coded into the final character for both packages. Additional tracking information is coded into "dots" located adjacent to the device pins. For further information about a specific device, please contact your local field sales office or the TI Product Information Center.

PicoGate Logic

PicoGate Logic uses a three-character name rule. The first character denotes the technology family, the second character denotes device function, and the third character denotes a wafer fabrication and assembly-test facility combination (for internal tracking here denoted by x).

Example: A PicoGate Logic device with a package code of BAx is an SN74AHCT1G00DBV.

Microgate Logic

Microgate Logic uses a four-character name rule. The first character denotes the technology family, the second and third characters denote device function, and the fourth character denotes a wafer fabrication and assembly-test facility combination (for internal tracking, here denoted by x).

Example: A Microgate Logic device with a package code of A02x is an SN74AHC1G02DCK.

Table 3. Device Technology Codes

TECHNOLOGY	CODE
AHC	A
AHCT	B
ALVC	G
CBT	S
CBTD	P
LVC1G**A	L
LVC1G**B	C
CBTLV1G	V

Table 4. Device Function Codes

FUNCTION	DCK	DBV
00	A	00
02	B	02
04	C	04
05	5	05
06	T	06
07	V	07
08	E	08
125	M	25
126	N	26
132	Y	3B
14	F	14
157		57
240	K	40
241		41
245		45
32	G	32
79	R	79
80	X	80
86	H	86
4066	L	
U04	D	U4

Package Breakout by Levels

PACKAGE	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
PLCC	FN (20/28)		FN (44/68)	
SOT	DBV (5) DCK (5)			
SOP	NS (14/16/20) PS (8)			
SOIC	D (8/14/16) DW (16/20/24/28)			
SSOP	DB (14/16/20/24/28/30/38) DBQ (16/20/24) DL (28/48/56)			
TSSOP	PW (8/14/16) DGG (64)	PW (20/24)	DGG (48/56)	
TVSOP	DGV (14/16) DBB (80)	DGV (20/24/48/56)		
QFP		RC (52)		
TQFP		PAG (64) PN (80) PCA (100) PZ (100)		PM (64)
MicroStar BGA			GKE (96) GKF (114)	

NOTES: 1. No current device packages are moisture-sensitivity levels 5 or 6.
2. Some device types in these packages may have different moisture-sensitivity levels than shown.

TI's through-hole packages (N, NT) have not been tested per the JESD22-A112A/JESD22-A113A standards. Due to the nature of the through-hole PCB soldering process, the component package is shielded from the solder wave by the PC board and is not subjected to the higher reflow temperatures experienced by surface-mount components.

TI's through-hole component packages are not classified as moisture sensitive.

Moisture-Sensitivity Levels
(JESD22-A112A/JESD22-A113A)

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS	
	CONDITIONS	TIME (hours)	CONDITIONS	TIME (hours)
1	≤ 30°C/90% RH	Unlimited	85°C/85% RH	168
2	≤ 30°C/60% RH	1 year	85°C/60% RH	168
				X + Y = Z[†]
3	≤ 30°C/60% RH	168	30°C/60% RH	24 + 168 = 192
4	≤ 30°C/60% RH	72	30°C/60% RH	24 + 72 = 96
5	≤ 30°C/60% RH	24	30°C/60% RH	24 + 24 = 48
6	≤ 30°C/60% RH	6	30°C/60% RH	0 + 6 = 6

RH = Relative humidity
[†] X + Y = Z, where:

> X = Default value of time between bake and bag. If the actual time exceeds this value, use the actual time and adjust the soak time (Z). For levels 3–6, X can be standardized at 24 hours as long as the actual time does not exceed this value.
> Y = Floor life of package after it is removed from dry-pack bag
> Z = Total soak time for the evaluation

For more information, see:

> *Packaging Material Standards for Moisture-Sensitive Items*, EIA Std EIA-583

> *Symbol and Labels for Moisture-Sensitive Devices*, EIA/JEDEC Engineering Publication EIA/JEP113-B, May 1999

> *Guidelines for the Packing, Handling, and Repacking of Moisture-Sensitive Components*, EIA/JEDEC Publication EIA/JEP124, December 1995

Competitive Cross-Reference

	NO. OF PINS	BODY WIDTH (in/mm)	LEAD PITCH (in/mm)	PACKAGE					
				TI	PHILIPS	FAIRCHILD	TOSHIBA	MOTOROLA	IDT
LFBGA	96	5.5 mm	0.8 mm	GKE	GKE				
	114	5.5 mm	0.8 mm	GKF	GKF				
PDIP	14, 16, 18, 20	0.31/7.87	0.1/2.54	N	N	N	P	P, N	P
	24, 28	0.31/7.87	0.1/2.54	NT				N	P
QSOP	16, 20, 24	0.157/4	0.025/0.64	DBQ		MQA			Q
SOIC	8, 14, 16	0.157/4	0.05/1.27	D	D	M/S	F	D	
	16, 20, 24	0.299/7.59	0.05/1.27	DW	D	WM		DW	PS, PE
SSOP	14, 16, 20, 24	5.6 mm	0.65 mm	DB	DB	MSA	FN	SD	PY
	48, 56	0.299/7.59	0.025/0.635	DL	DL	MEA			PV
TSSOP	14, 16, 20, 24	4.5 mm	0.65 mm	PW	PW/DH	MTC	FS	DT	PG
	48, 56, 64	6.32 mm	0.5 mm	DGG	DGG	MTD	FT		PA
TVSOP	14, 16, 20, 24, 48, 56	4.5 mm	0.4 mm	DGV	DGV				PF†
	80	6.2 mm	0.4 mm	DBB					
Single gate	5	1.8 mm	0.95 mm	DBV		M5	F		
		1.35 mm	0.65 mm	DCK	DCK		FU		
Tape and reel				R‡	-T	X	EL	R2	T/R

† IDT offers a TSSOP package with similar specifications and lead pitch to TI's TVSOP package.
‡ Tape and reel packaging is available for surface-mount packages only. Order in full reels. LE designation may be found for DB or PW packages, but normal tape and reel designation is R.

TI Packages

D, DW – Small-Outline Integrated Circuit (SOIC)
DB, DL – Shrink Small-Outline Package (SSOP)
DBB, DGV – Thin Very Small-Outline Package (TVSOP)
DBQ – Quarter-Size Outline Package (QSOP)
DBV, DCK – Small-Outline Transistor Package (SOT)
DGG, PW – Thin Shrink Small-Outline Package (TSSOP)
FN – Plastic Leaded Chip Carrier (PLCC)
GKE, GKF – MicroStar BGA Low-Profile Fine-Pitch BGA (LFBGA)
N, NP, NT – Plastic Dual-In-Line Package (PDIP)
NS, PS – Small-Outline Package (SOP)
PAG, PAH, PCA, PCB, PM, PN, PZ – Thin Quad Flatpack (TQFP)
PH, PQ, RC – Quad Flatpack (QFP)

PACKAGING CROSS-REFERENCE

Logic Devices

Tube Quantities

	PIN COUNT									
	8	**14**	**16**	**20**	**24**	**28**	**44**	**48**	**56**	**68**
DIP	50	25	25	20	15	13	N/A	N/A	N/A	N/A
PLCC	N/A	N/A	N/A	46	N/A	37	26	N/A	N/A	18
SOIC	75	50	40	25	25	20	N/A	N/A	N/A	N/A
SSOP	N/A	N/A	NS	N/A	N/A	40	N/A	25	20	N/A

NOTE 1: QSOP (DBQ) and EIAJ devices (DB, NS, PS, and PW packages) are not available in tubes.

Reel Quantities

		PACKAGE DESIGNATOR	UNITS PER REEL
EIAJ surface mount		DBR/DBLE, NSR/NSLE, PWR/PWLE	2000
LFBGA	96/114 pin	GKE, GKF	1000
PLCC	28 pin	FNR	750
	44 pin	FNR	500
QSOP	16/20/24 pin	DBQR	2500
SSOP	48/56 pin	DLR	1000
SOIC/SOP	14/16 pin	DR	2500
	Widebody 16 pin	DWR	2000
	20/24 pin	DWR	2000
	28 pin	DWR	1000
TQFP	64 pin	PMR	1000
TSSOP		DGGR	2000

Box Quantities

		PACKAGE DESIGNATOR	UNITS PER BOX
DIP		N	1000
		NT	750
		NP	700
SOIC		D, DW	1000
SSOP	48/56 pin	DL	1000

Tray Quantities

		PACKAGE DESIGNATOR	UNITS PER TRAY
TQFP	64 pin	PM	160

LOGIC OVERVIEW

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LOGIC PRODUCTS FORMERLY OFFERED
BY HARRIS SEMICONDUCTOR

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1999 SLL Priorities

✳ AHC/AHCT Conversion From HCMOS

✳ Continue Success of CBT Bus-Switch Market

✳ Continue Low-Voltage Logic Dominance

✳ Increase Leadership Position in Linear Products

✳ Support Former Harris Semiconductor Customers

One-Stop Logic Shop!

Product Life Cycle

BCT **HC**

F

ACL

ALS **AS**

ABT **FCT**

CD4000

LVC **LVT**

LS

LV-A

S

AHC **ALVC**

ALVT

TTL

AVC

Introduction *Growth* *Maturity* *Decline* *Obsolescence*

Legend:
- ▲ Bipolar
- ◆ CMOS
- ● BiCMOS
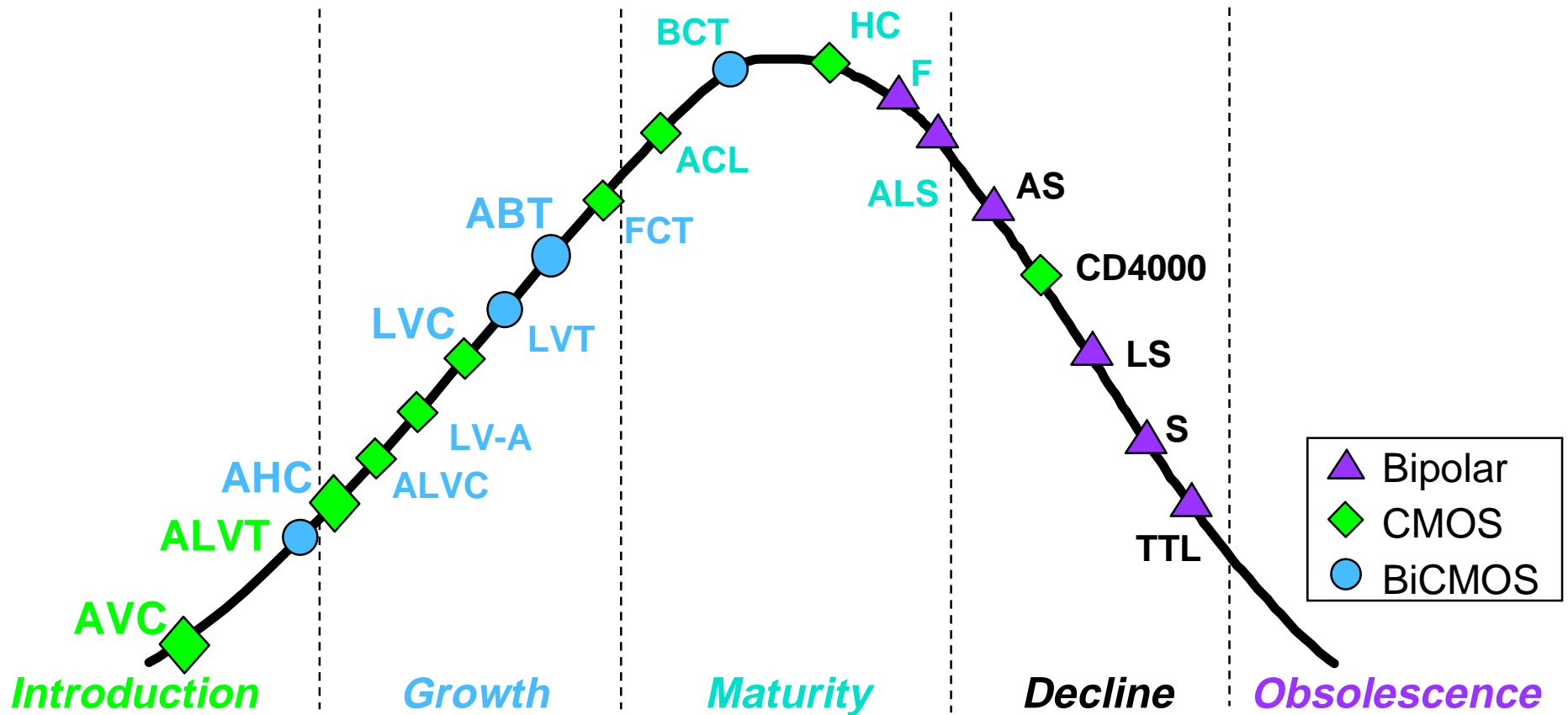
✦ TI remains committed to be the last supplier in the older families

✦ Investment levels for new products are at an all-time high, while end-equipment requirements are accelerating new product introduction

Standard Linear & Logic

Family Performance Positioning
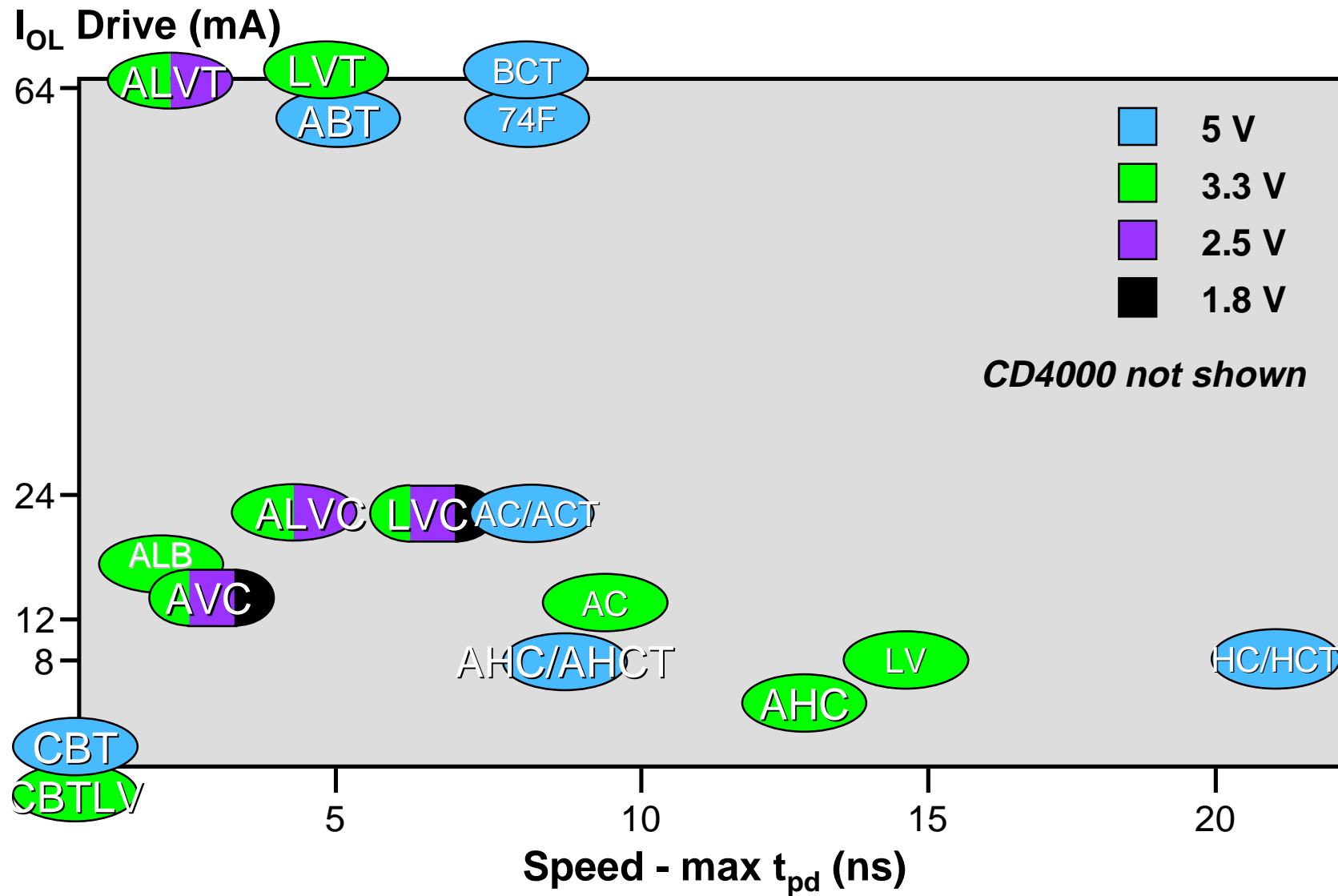
HCMOS Market Analysis

✦ **Data Indicates DESIGNERS prefer HCMOS due to:**

- Low noise
- Low power
- Low price

✦ **Requested Improvements**

- Improve output current
- Improve power consumption
- Improve package offering
- 5-V signal tolerance
- Better availability
- Higher speed

AHC/ AHCT

Standard Linear & Logic
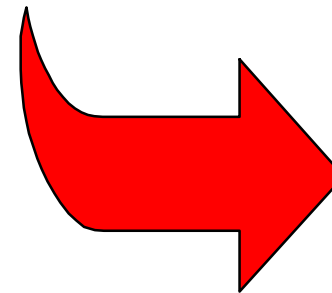
AHC/AHCT: Advanced HCMOS
A Reliable and Effortless Migration Path for HCMOS Users

Ground Bounce (V_{OLP})

Static Power Consumption

Propagation Delay

Drive - I_{OL}
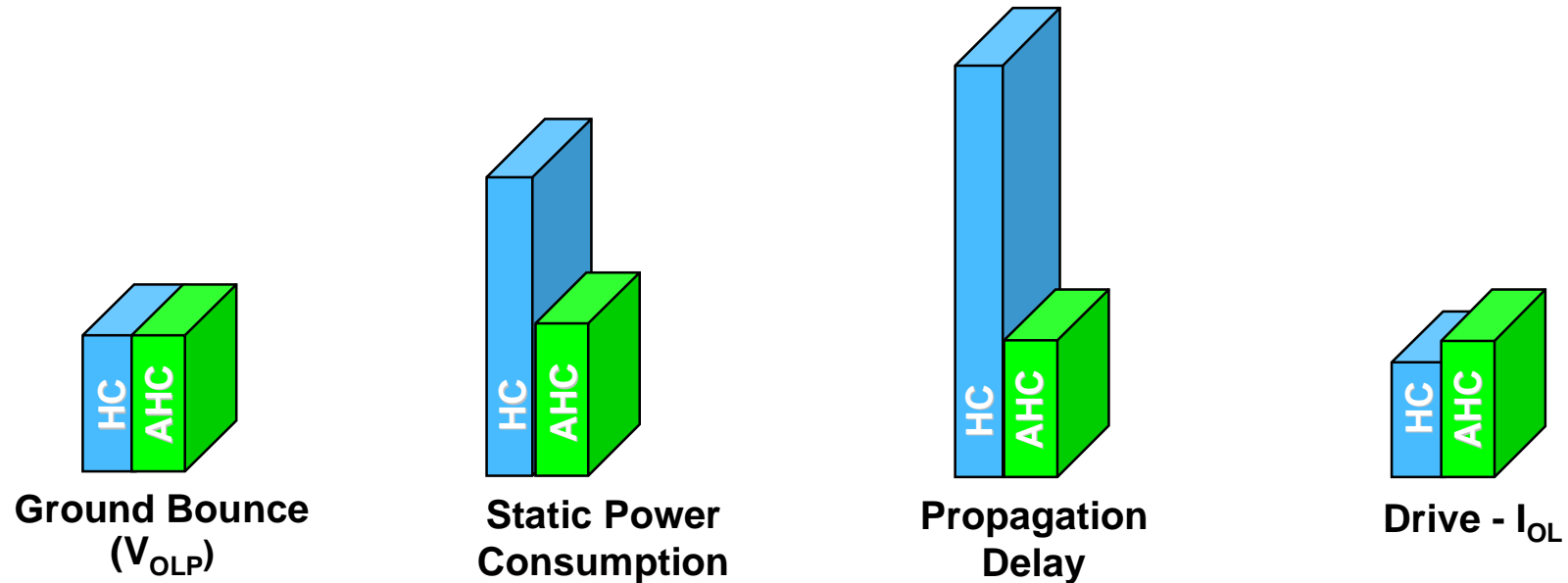
at the current market price of hcmos!

Plus

- Output Edge Control (OEC™)

- Improved package offering: TVSOP, TSSOP, SSOP, SOIC, PDIP

- Widebus™ (16-bit), single gate (single-bit) options available

- 5-V input tolerance (AHC specified in data sheets at both 5 V and 3.3 V. Input diode to V_{CC} removed)

- Highest availability of any logic family on the market! - Five worldwide sources

- TI is the No. 1 worldwide logic source (1996 - doubled CMOS and fine-pitch package capacity)

Standard Linear & Logic

A Reliable and Effortless Migration Path for HCMOS Users
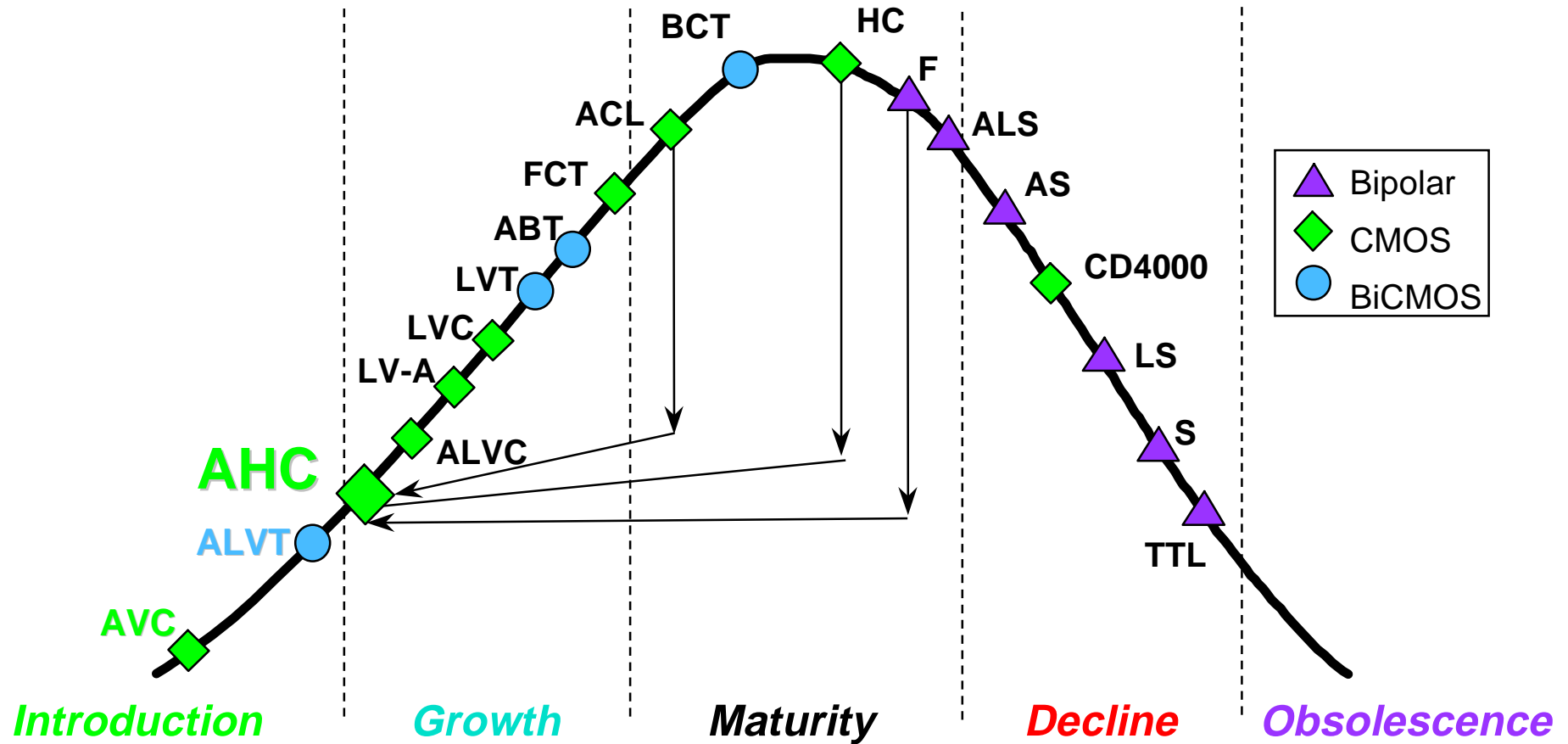
For HCMOS, AC/ACT, and 74F upgrades, AHC is the family of choice!

AHC/AHCT Single-Gate Logic

SN 74 AHC 1G 00 DCK/DBV

- SOT Package
- Logic Function
- Single Gate
- Advanced HCMOS Technology
- Logic Identifier
- TI Identifier
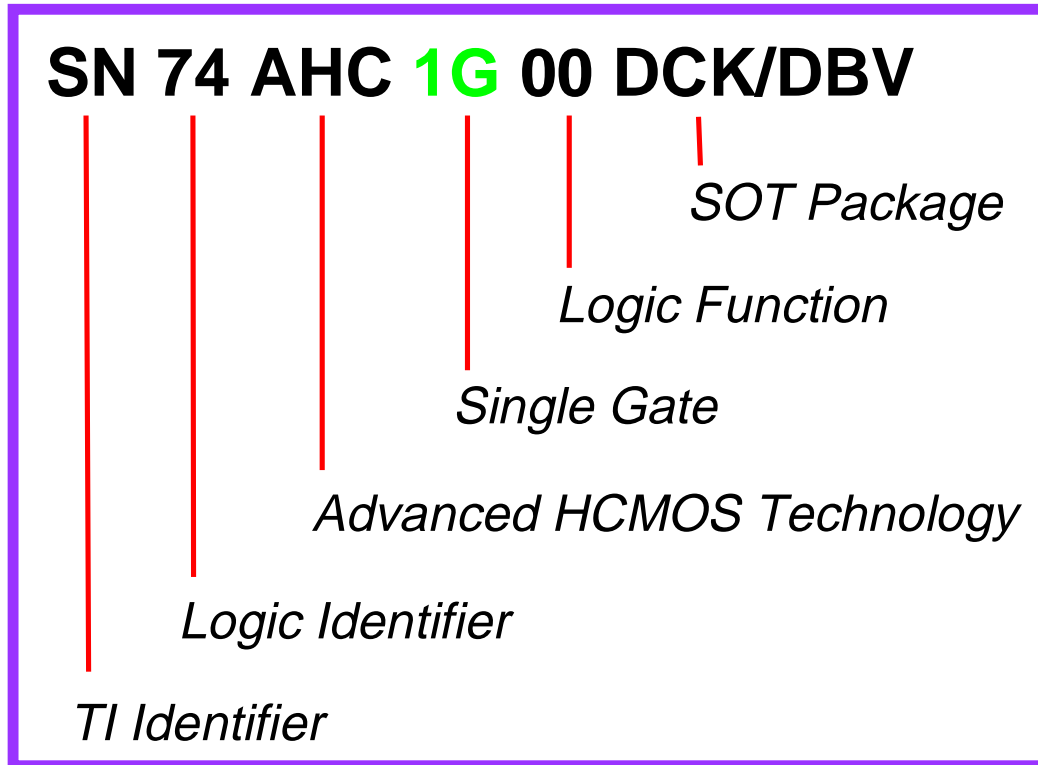
✦ Simplifies circuit routing
✦ ASIC modification
✦ Industry's smallest logic package reduces circuit board space requirement
✦ Alternate source by Philips
✦ CMOS compatible (AHC) and TTL compatible (AHCT) versions
✦ Compatible with Toshiba's TC7SH/SETxx series and Fairchild's NC7SH/NC7ST series
✦ Samples available NOW

Cross-Reference (examples)

Texas Instruments	Toshiba	Fairchild	Texas Instruments	Toshiba	Fairchild
SN74AHC1G00DBV	TC7SH00F	NC7SH00M5	SN74AHC1G00DCK	TC7SH00FU	NC7SH00P5
SN74AHCT1G000DBV	TC7ST00F	NC7ST00M5	SN74AHCT1G00DCK	TC7SHT00FU	NC7ST00P5
SN74AHCU1GU04DBV	TC7SHU04F	NC7SU04M5	SN74AHC1GU04DCK	TC7SHU04FU	NC7SU04P5

Standard Linear & Logic

Bus-Hold Input Characteristics

Bus-Hold Input Cell

Input
Inverter
Stage

I/O Pin

Device Boundary
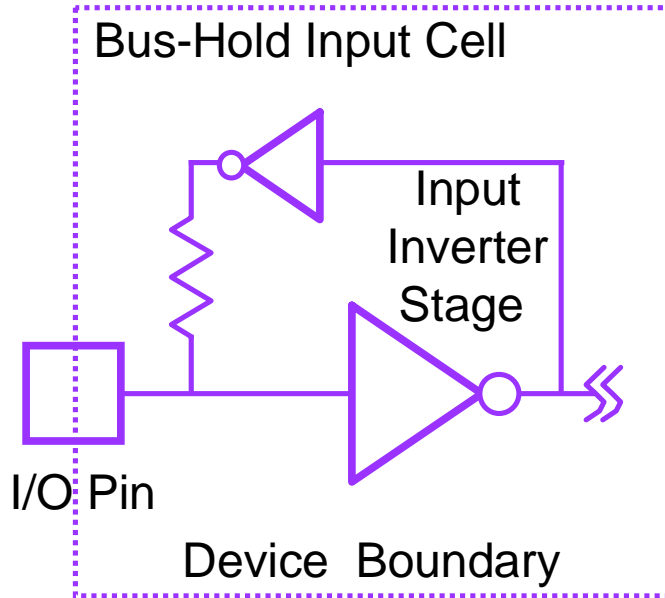
Bus-hold input cell replaces pullup resistor

✦ Holds the last known state of the input

✦ $I_{i(HOLD)}$ ± 75 µA min holding current at 0.8 V and 2 V

✦ Bus-hold current does NOT load the driving output at valid logic levels

✦ Eliminates the need for external resistors on unused or floating input/output pins

✦ The "H" in the device name indicates bus hold

Device	ABT	AVC	LV	LVC	ALVC	LVT	ALVT
Bus-hold versions	✗ *	✗		✗	✗	✗	✗
Non-bus-hold versions	✗	✗	✗	✗ *	✗ *	✗ *	

Standard
Linear &
Logic

TI Series Damping Resistors vs. Balanced Drive

V_{CC}

25 Ω

V_{CC}

26 Ω

13 Ω
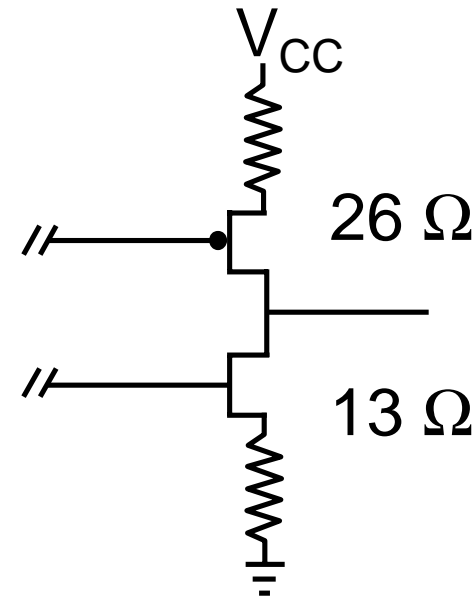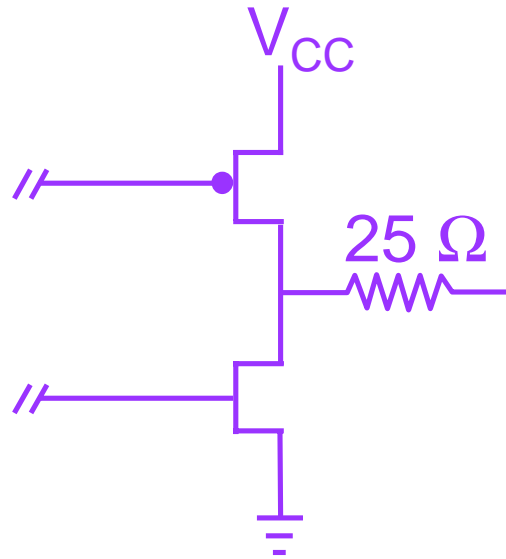
TI's placement of the series damping resistor meets both goals:

✦ *Limit current*

✦ *Help in line termination*

e.g.: 'ABT2245
'LVCHR162245
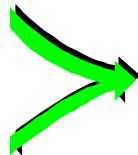
Extra "2" or "R" in device name indicates damping resistor

Standard
Linear &
Logic

Continued Logic Leadership
ABT vs. FCT

ABT is the undisputed WINNER in the ABT/FCT battle

- **FCT TAM at $171M**

- **ABT TAM at $220M**

- **TI dominates the ABT market: 80% market share**

1997 TAM in Units

FCT = 194 Mu 1% Decline

ABT = 217 Mu 28% Growth!
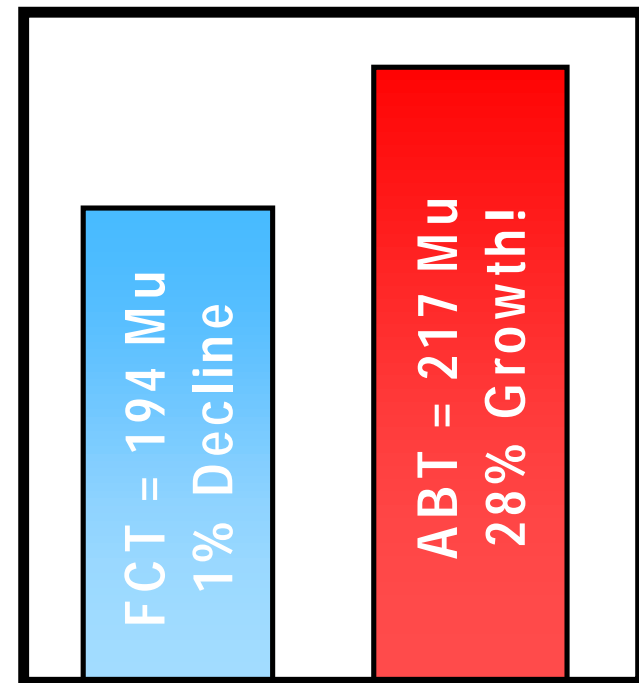
ABT is the Clear Winner!

Source: Insight Onsite/1998 Edition

Standard Linear & Logic

ABT Offers the Complete 5-V Solution

Product Features	ABT	FCT
High Performance	✓	✓
I_{off} Specification (Live Insertion)	✓	✓
Competitive Pricing	✓	✓
Bus Hold (Selected Functions)	✓	✓
Lowest Ground Bounce	✓	
True Series Damping Resistor Options	✓	
Power-Up 3-State	✓	
Strongest Supplier Base	✓	
JTAG Options Available	✓	
Low-Voltage Migration Path	✓	

Standard Linear & Logic

ABT Has Lower Ground Bounce!

V_{OLP}
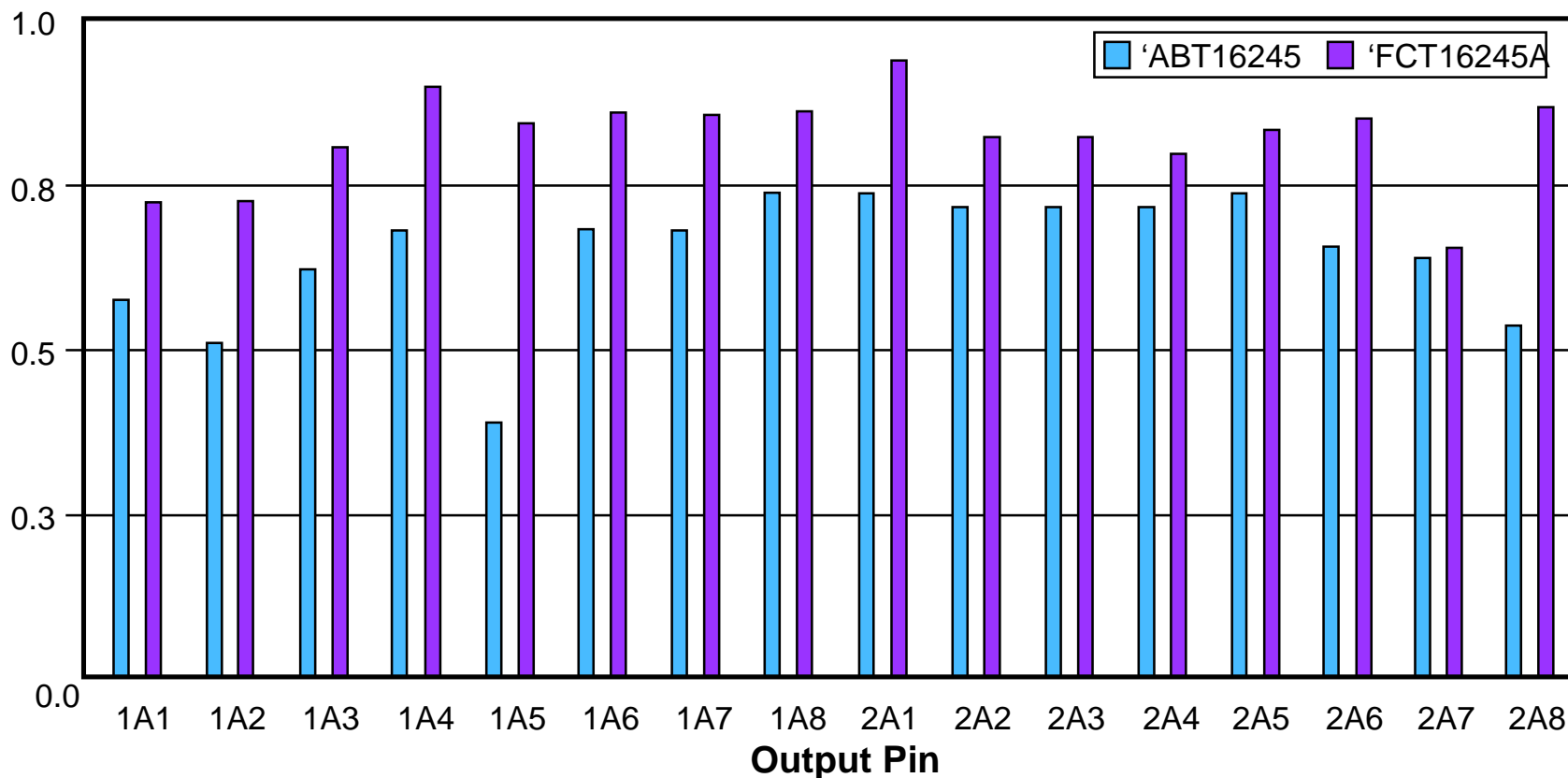
V_{CC} = 5.5 V, C_L = 50 pF, R_L = 500 Ω, 15 Outputs Switching,
Freq = 1 MHz, T_A = 25°C, V_{INL} = 0.5 V, V_{INH} = 2.5 V

Partial Power Off

System Function/Capability

$V_{CC} = 5V$ $V_{CC} = 0V$
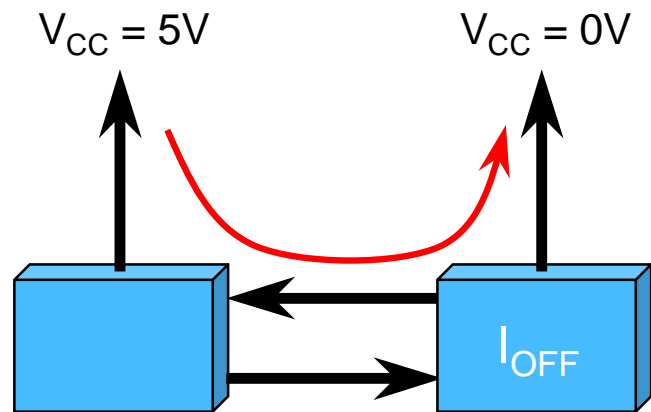
I_{OFF}

Supporting Device Specifications

I_{OFF}

This data supports the following families:
ABT, ALVT, AVC, LVC, LVT, GTL

Circuit Implementation
I_{OFF} Circuit

V_{CC} I_{OFF} Feature

Blocking Diode

Parasitic Diode V_{PIN}

$\leftarrow I_{PIN} -$

Output Stage
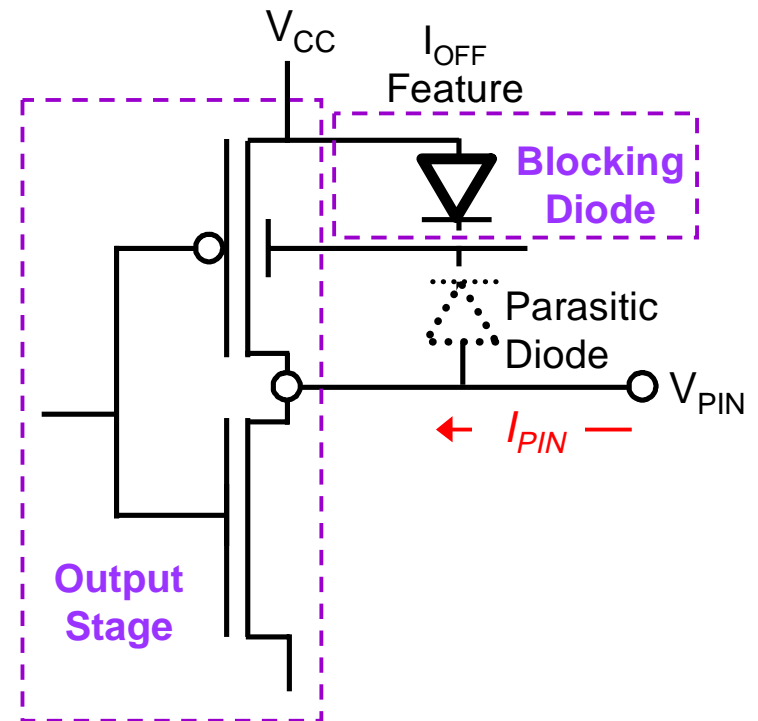
When $V_{CC} = 0$, $I_{PIN} = 0$ for $V_{PIN} = $ min to max.

Standard **L**inear & **L**ogic

Hot Insertion

System Function/Capability

V_{CC} = 5V

V_{CC} = 5 V
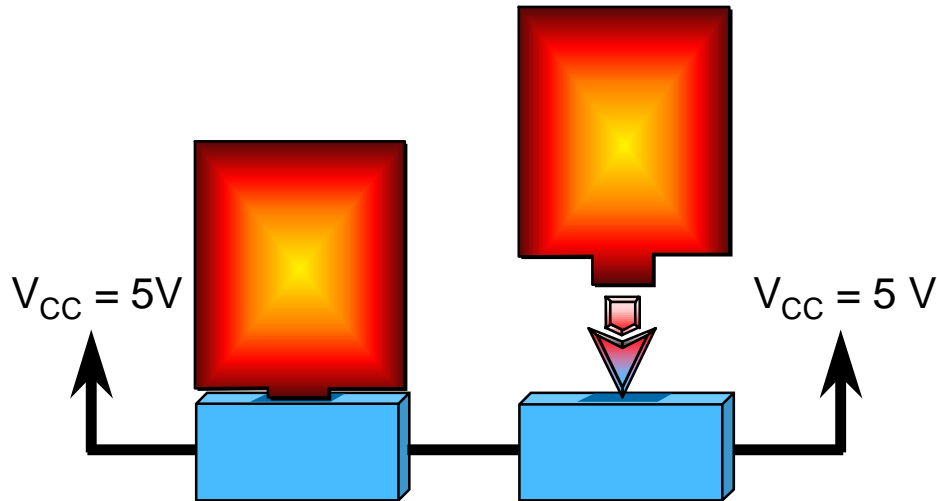
Supporting Device Specifications

I_{OFF}

I_{OZPU}

I_{OZPD}

This data supports the following families:
ABT, ALVT, FB, GTL, LVT*
(selected devices)*

Example Circuit Implementation PU3S Circuit

V_{CC}

5.0 V

2.1 V

Output

Off (Z)   On   Off (Z)

PU

$\overline{OE}$

$\overline{EN}$

PU = 1 ➔ $\overline{EN}$ = $\overline{OE}$

PU = 0 ➔ $\overline{EN}$ = 1 ➔ Z

Standard **L**inear & **L**ogic

Live Insertion

System Function/Capability

V_{CC}

V_{CC}

Supporting Device Specifications

I_{OFF}
I_{OZPU}
I_{OZPD}
V_O, $V_{CC} = 0$, BIAS V_{CC} = min to max

This data supports the following families:
ABTE, CBT*, CBTLV*, FB, GTL* (* selected devices)

Circuit Implementation
Precharge Circuit

V_{CC}

BIAS V_{CC}②

V_{CC}

Precharge
Circuit

I/O

V_{CC}

Output
Stage

GND

①

Card Pin

Socket

V_{CC} I/O BIAS V_{CC} GND

Standard
Linear &
Logic

ABT Has Power-Up 3-State!
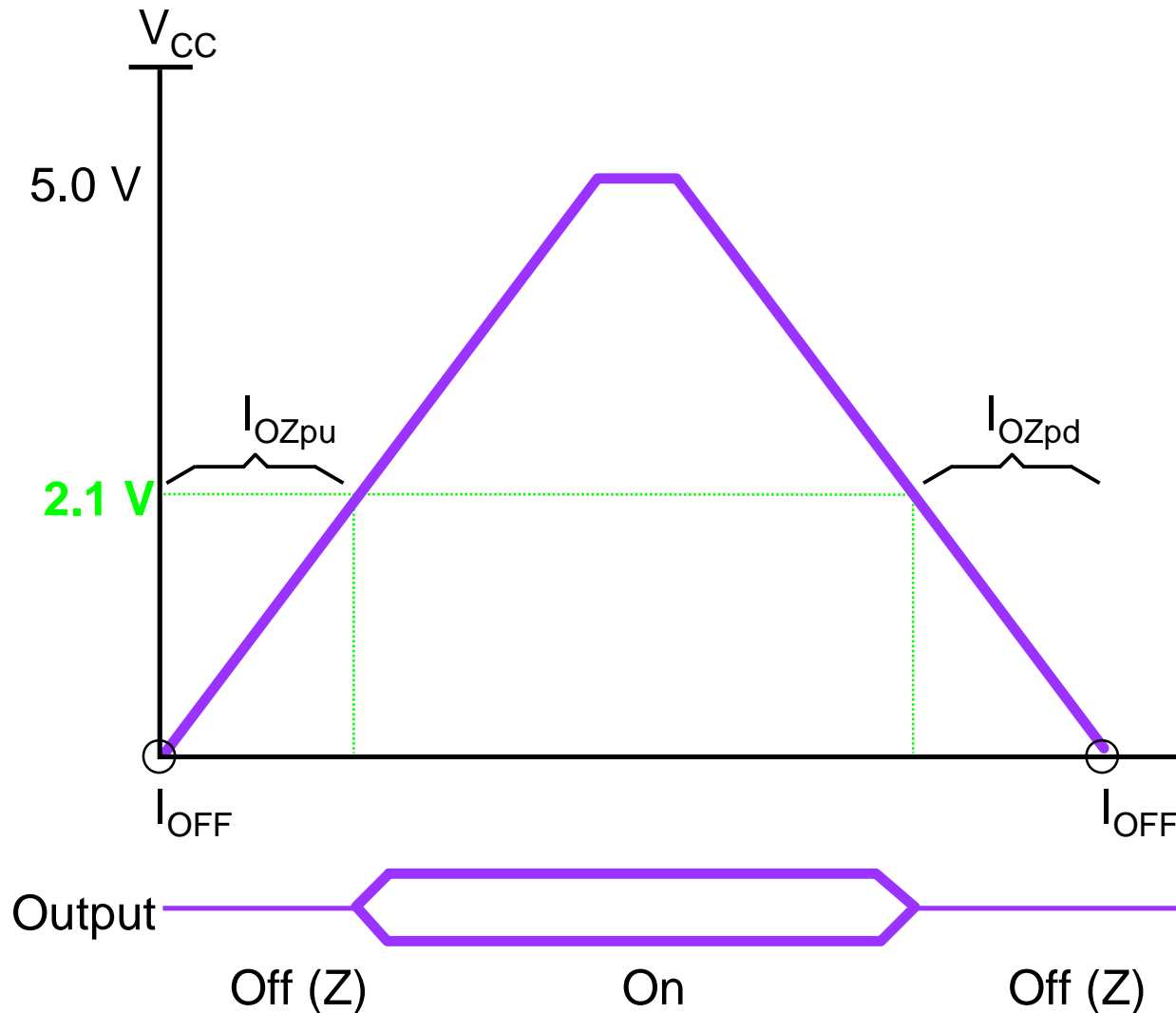
- ✦ To ensure valid output levels during power up/power down

  I_{OZpu}, I_{OZpd} on data sheet

- ✦ To ensure high Z on output during power off

  I_{OFF} on data sheet

CBT Bus-Exchange Switches

'CBT3383 BUS EXCHANGER

1 of 5 Channels

A1 — B1
A2 — B2
BX
BE

'CBT3384A BUS SWITCH

1 of 2 Channels

A1 — B1
A5 — B5
OE
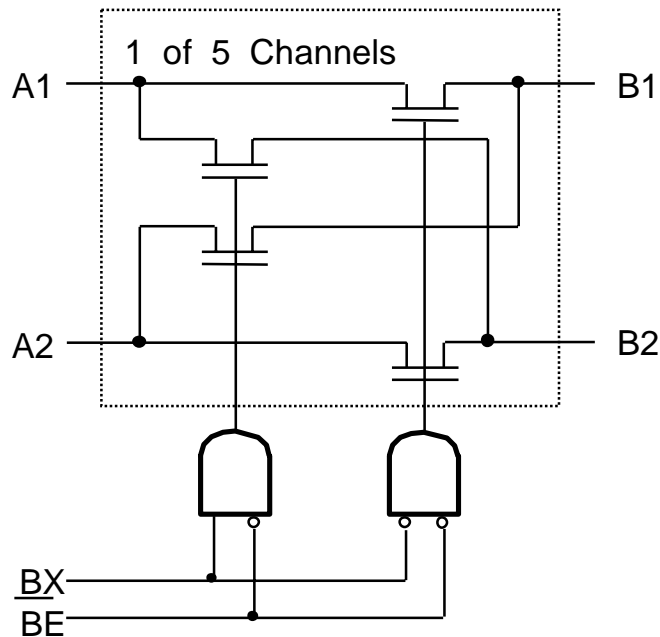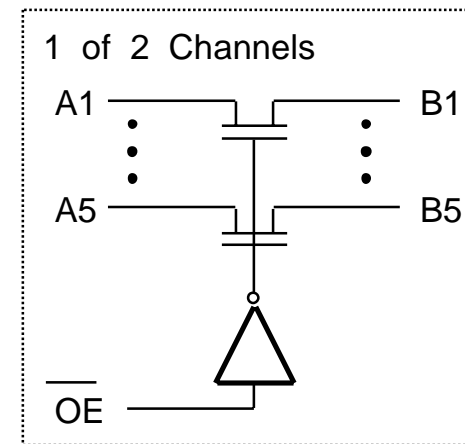
- ✦ Simple FET switches
- ✦ Functionally equivalent to: QS3383 and QS3384
- ✦ Industry standard pinouts ('244, '245)
- ✦ Widebus™ functions available
- ✦ Fine-pitch packaging options (SOIC, SSOP, TSSOP, Widebus, Shrink Widebus™)
- ✦ Octals and Widebus available

Widebus and Shrink Widebus are trademarks of Texas Instruments Incorporated

Standard Linear & Logic

CBT Single-Gate Logic

SN 74 CBT 1G 125 DBV/DCK

SOT Package

Logic Function

Single Gate

Crossbar Technology

Logic Identifier

TI Identifier
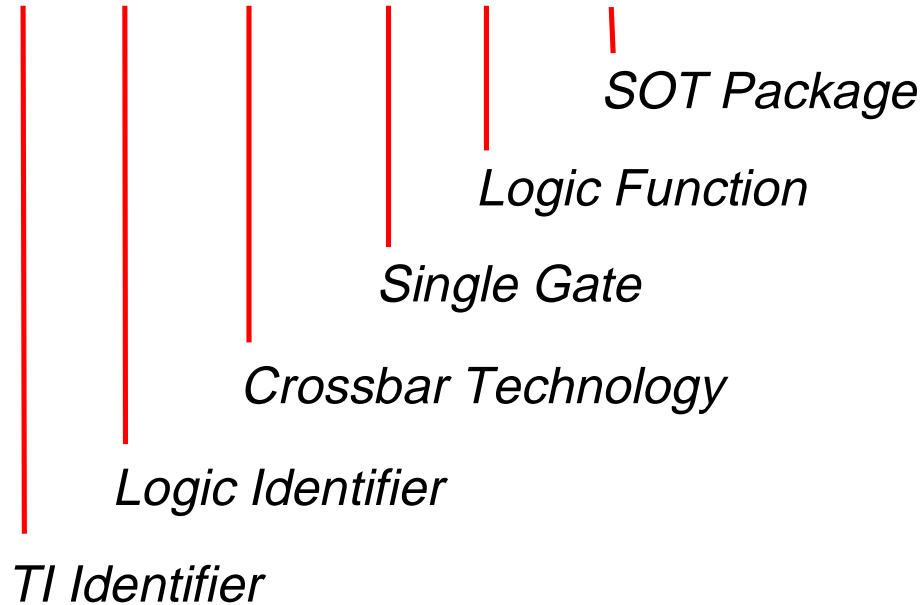
✦ Simplifies circuit routing

✦ 250-ps propagation delay

✦ Low on-state resistance (5 Ω)

✦ Ideal for control-signal isolation

$\overline{\text{OE}}$

A

GND

V_{CC}

B

Standard Linear & Logic
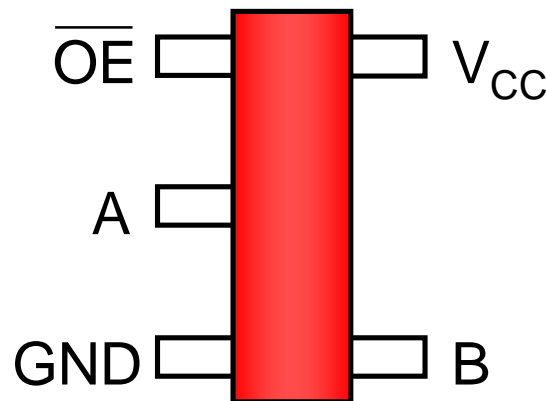
CBT vs. CBTLV
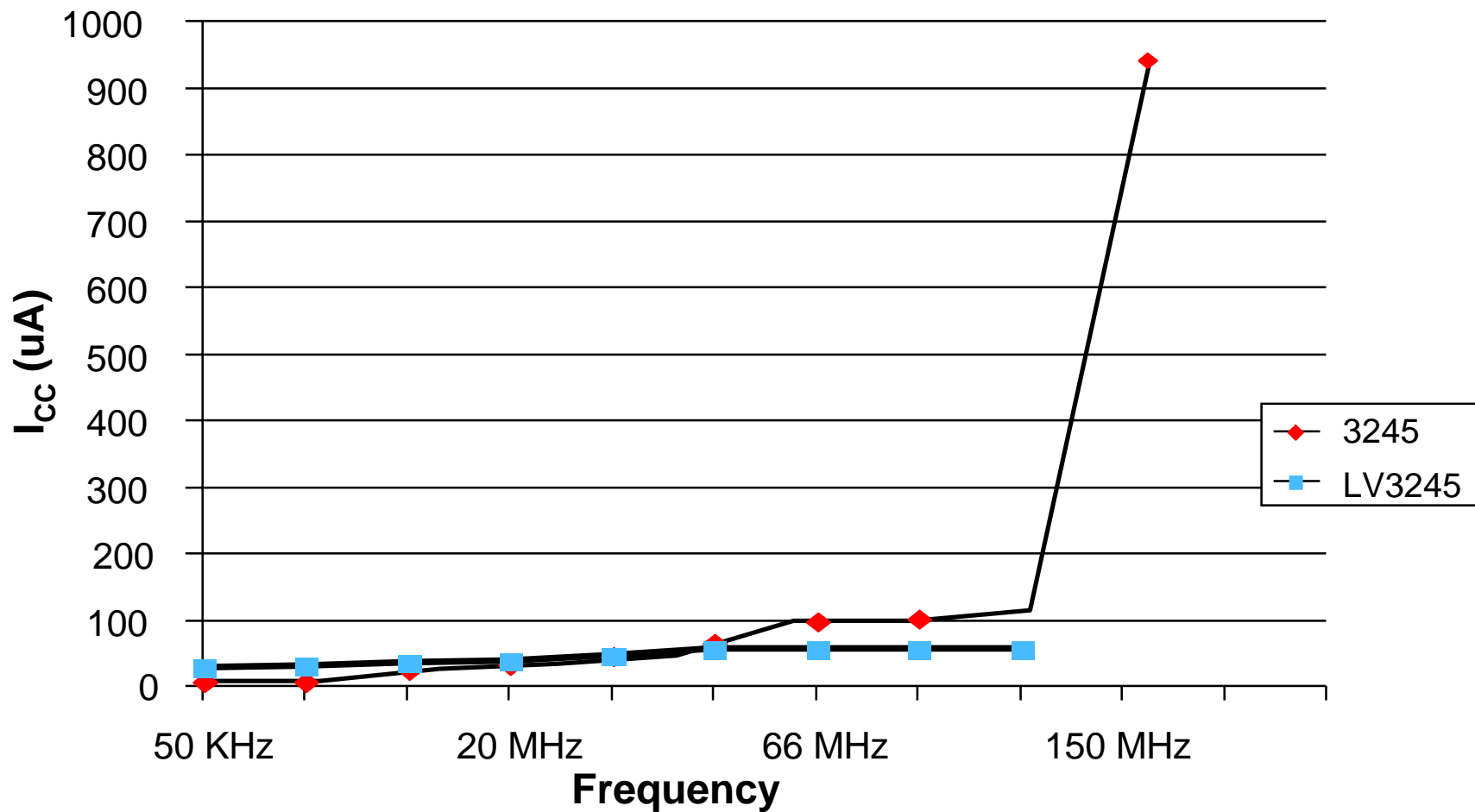
	50 KHz	1 MHz	10 MHz	20 MHz	33 MHz	50 MHz	66 MHz	100 MHz	150 MHz
'3245	9	9	25	35	48	99	99	113	939
'LV3245	29	32	36	40	48	57	58	58	58

CBT/CBTLV Product Offerings

✦ Multiple package offerings

✦ CBTD devices with integrated V_{CC} diode for 5-V to 3.3-V level translation

✦ CBTS devices with integrated Schottky diodes on inputs/outputs to clamp negative undershoots

✦ Broad product offerings

✦ First to market with CBTLV family

Standard Linear & Logic

Complete Low-Voltage Market Coverage and Standardization

Performance →

5 V	HC, LS	ACT, AHC ALS, 74F	ABT			
3.3 V	AHC, LV	LVC	LVT	ALVC	ALVT	AVC
2.5 V		LVC		ALVC	ALVT	AVC
1.8 V		LVC		ALVC		AVC

Legend: TI · Philips · Hitachi · IDT
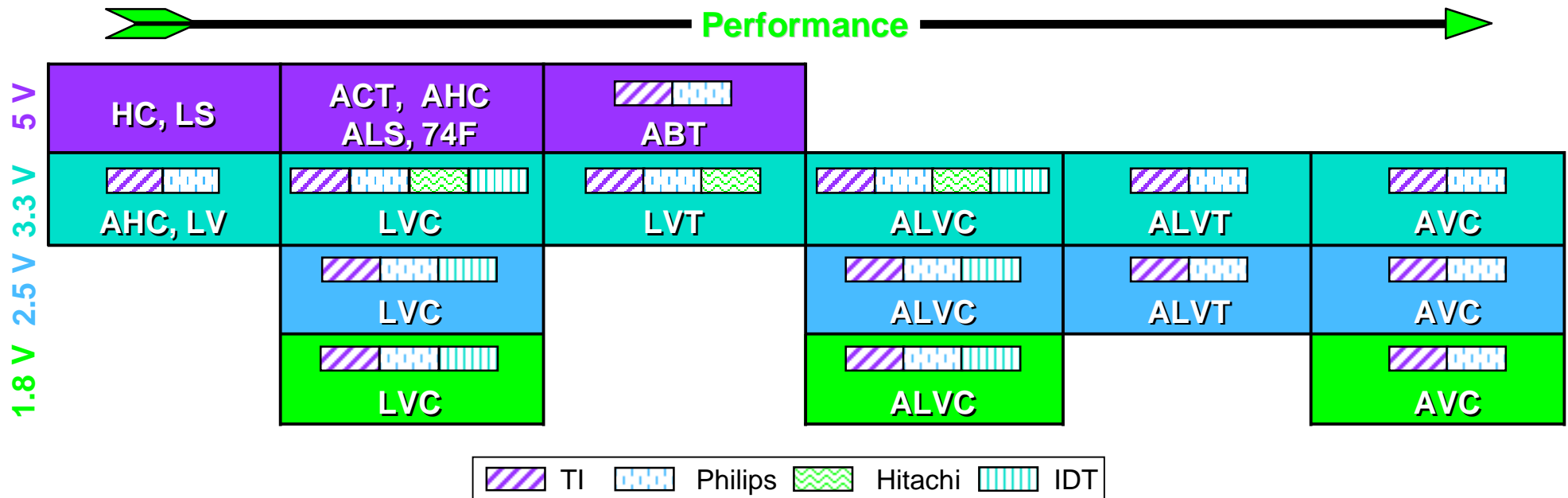
AHC
- ✓ 8.5ns speed (5V)
- ✓ 13.5ns speed (3.3V)
- ✓ -8/8mA drive (5V)
- ✓ -4/4mA drive (3.3V)
- ✓ 5V or 3.3V V_{CC}
- ✓ 5V input tolerant
- ✓ 4 WW sources

LVC
- 6.5ns speed
- -24/24mA drive
- Ultra-low (20µA) standby power
- 3 WW sources
- Bus hold
- 5V tolerant
- Gate functions
- Live insertion

LVT
- ✓ 4ns speed
- ✓ -32/64mA drive
- ✓ Low (90µA) standby power
- ✓ 3 WW sources
- ✓ Bus hold
- ✓ 5V tolerant
- ✓ Live insertion

ALVC
- ✓ 3ns speed
- ✓ -24/24mA drive
- ✓ Ultra-low (40µA) standby power
- ✓ 3 WW sources
- ✓ Bus hold

ALVT
- ✓ 2.4ns speed
- ✓ -32/64mA drive
- ✓ Low (90µA) standby power
- ✓ 2 WW sources
- ✓ Bus hold
- ✓ 5V tolerant
- ✓ Live insertion
- ✓ Auto 3-state

AVC
- ✓ < 2ns speed
- ✓ -12/12mA drive
- ✓ Ultra-low (40µA) standby power
- ✓ 2 WW sources
- ✓ Bus hold
- ✓ 3.3V tolerant
- ✓ Live insertion

Standard Linear & Logic

ALVC: Advanced Low-Voltage CMOS

Circuit Features

✦ Bus hold ($I_{I(HOLD)}$)

✦ Drive capability

(-24/24 mA @ 3.3-V V_{CC})

(-6 /12 mA @ 2.5-V V_{CC})

✦ Low noise

✦ Damping resistor options

✦ ESD protection

✦ Spec'd for 3.3-V and 2.5-V operation

Advantages

✦ Performance leadership products

✦ Marketing and applications support

✦ SPICE models

✦ Internal and external second sources

✦ Wide product portfolio

✦ Specialized memory interface functions available for SDRAMs

Standard Linear & Logic

AVC: Advanced Very High-Speed CMOS

Circuit Features

✦ Bus hold ($I_{I(HOLD)}$)

✦ Drive capability
  (-12/12 mA @ 3.3-V V_{CC})
  (-6 /6 mA @ 2.5-V V_{CC})
  (-4/4 mA @ 1.8-V V_{CC})

✦ Low noise

✦ DOC™ circuitry

✦ ESD protection

✦ Spec'd for 3.3-V,
  2.5-V, and 1.8-V operation

Advantages

✦ Performance leadership products

✦ Marketing and applications support

✦ SPICE models

✦ Internal and external second sources

✦ Wide product portfolio

✦ Specialized memory interface functions available for SDRAMs/DDR SDRAMs

Standard Linear & Logic

AVC Provides the Next Migration Path to Higher Performance and Lower Voltages

✦ AVC is the industry's fastest low-voltage logic family
  ▪ Sub-2-ns maximum propagation delays at 2.5 V
  ▪ More than 40% faster than comparable devices

✦ AVC features special circuitry that improves designs
  ▪ Patent-pending Dynamic Output Control (DOC™)
  ▪ I_{OFF}
  ▪ Bus hold

✦ AVC is optimized for 2.5 V and supports mixed-mode systems at 1.8 V and 3.3 V

Standard Linear & Logic

AVC vs. Advanced Low-Voltage CMOS Logic Solutions

(with and without Series Damping Resistors)*
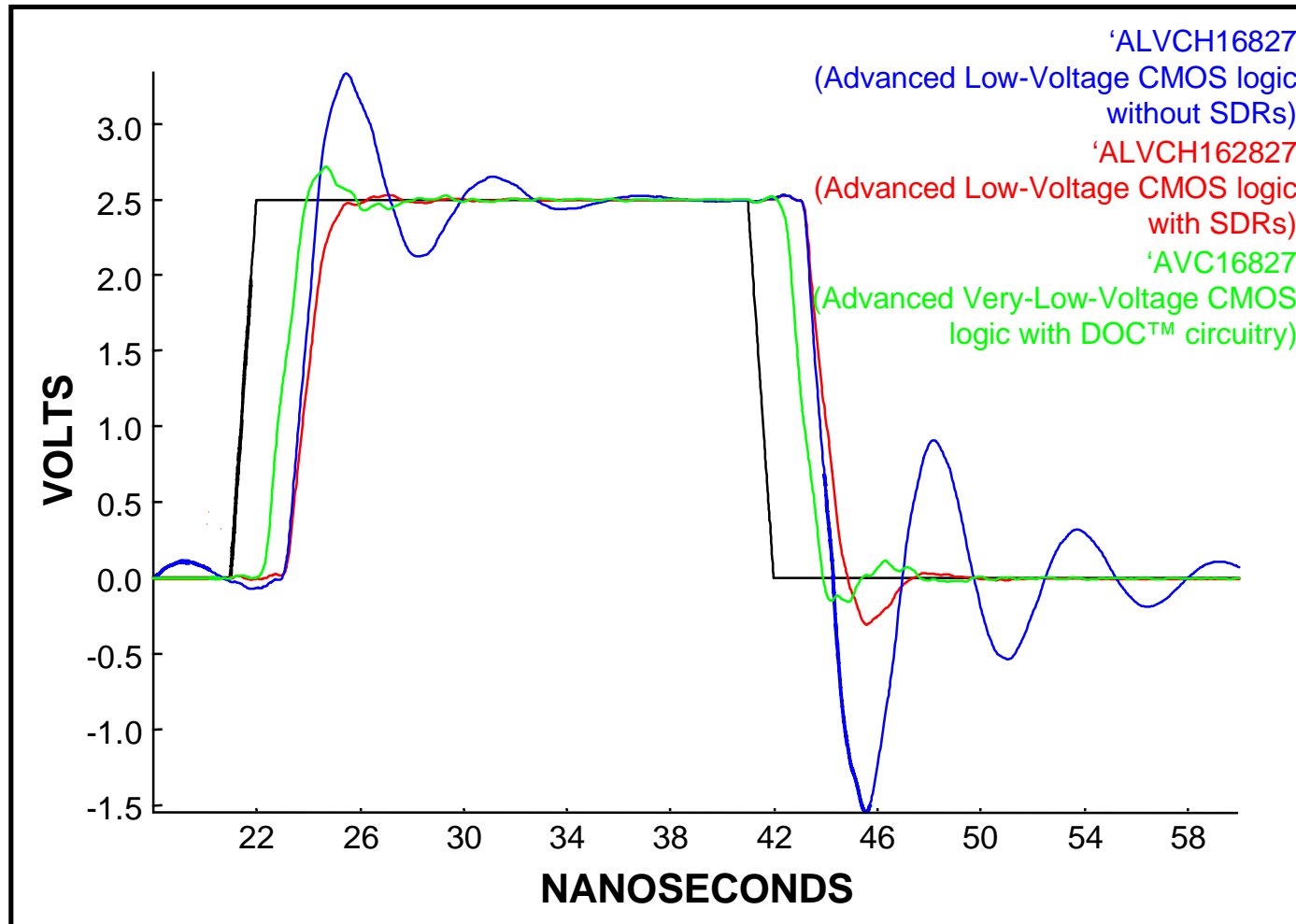
* Modeled data

DOC™ Circuitry Provides Signal Integrity Without Compromising Speed

DOC uses high drive only when needed (during transition)
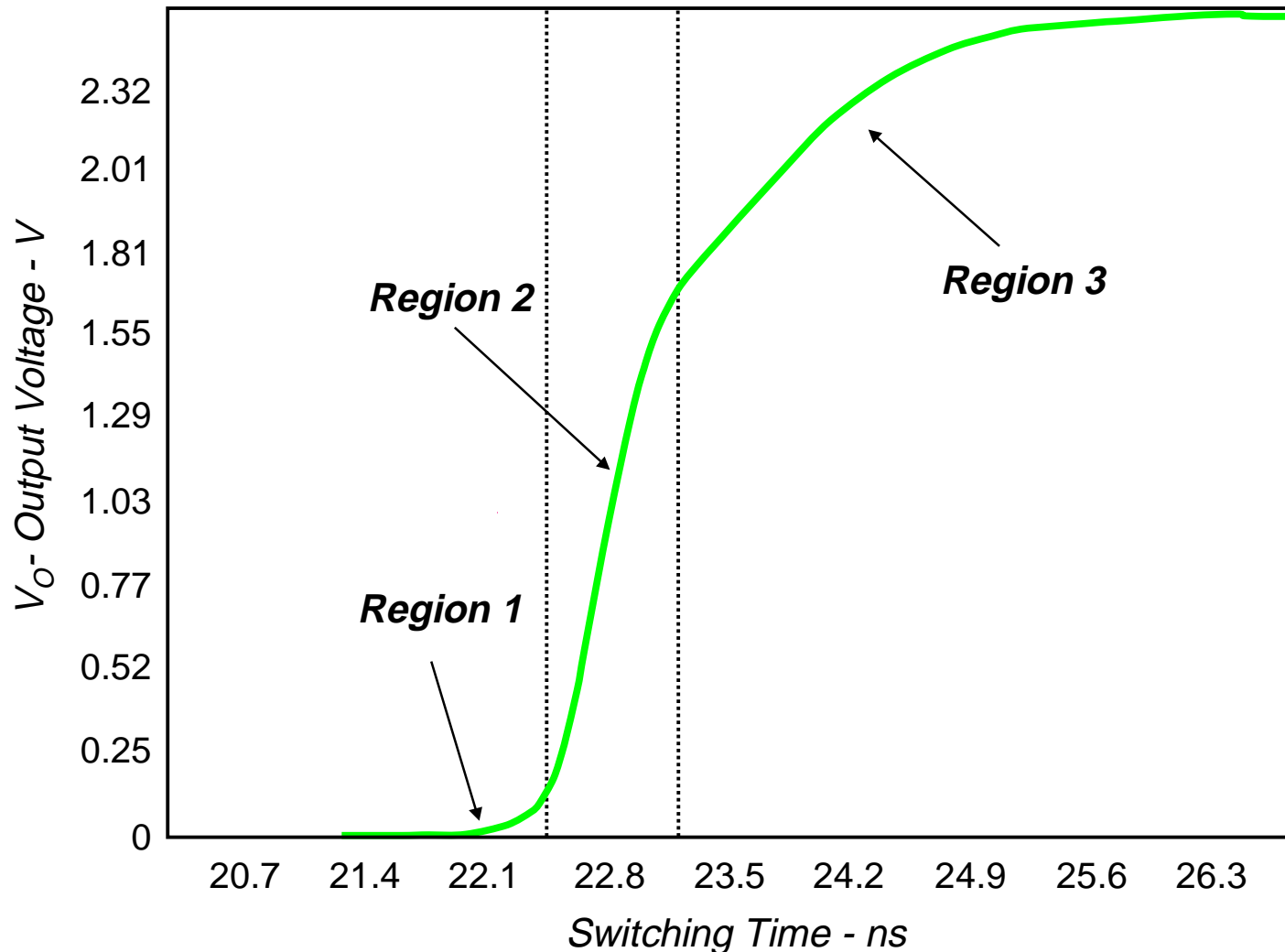
Region 1
- ◆ Low drive during steady state signal

Region 2
- ◆ Output impedance is dynamically lowered during signal transition to drive the line

Region 3:
- ◆ Output impedance is dynamically raised to reduce noisy signal overshoots/ undershoots

AVC Has Broadest Mixed-Mode Performance Positioning

Notes: 30-pF loading
Not to scale
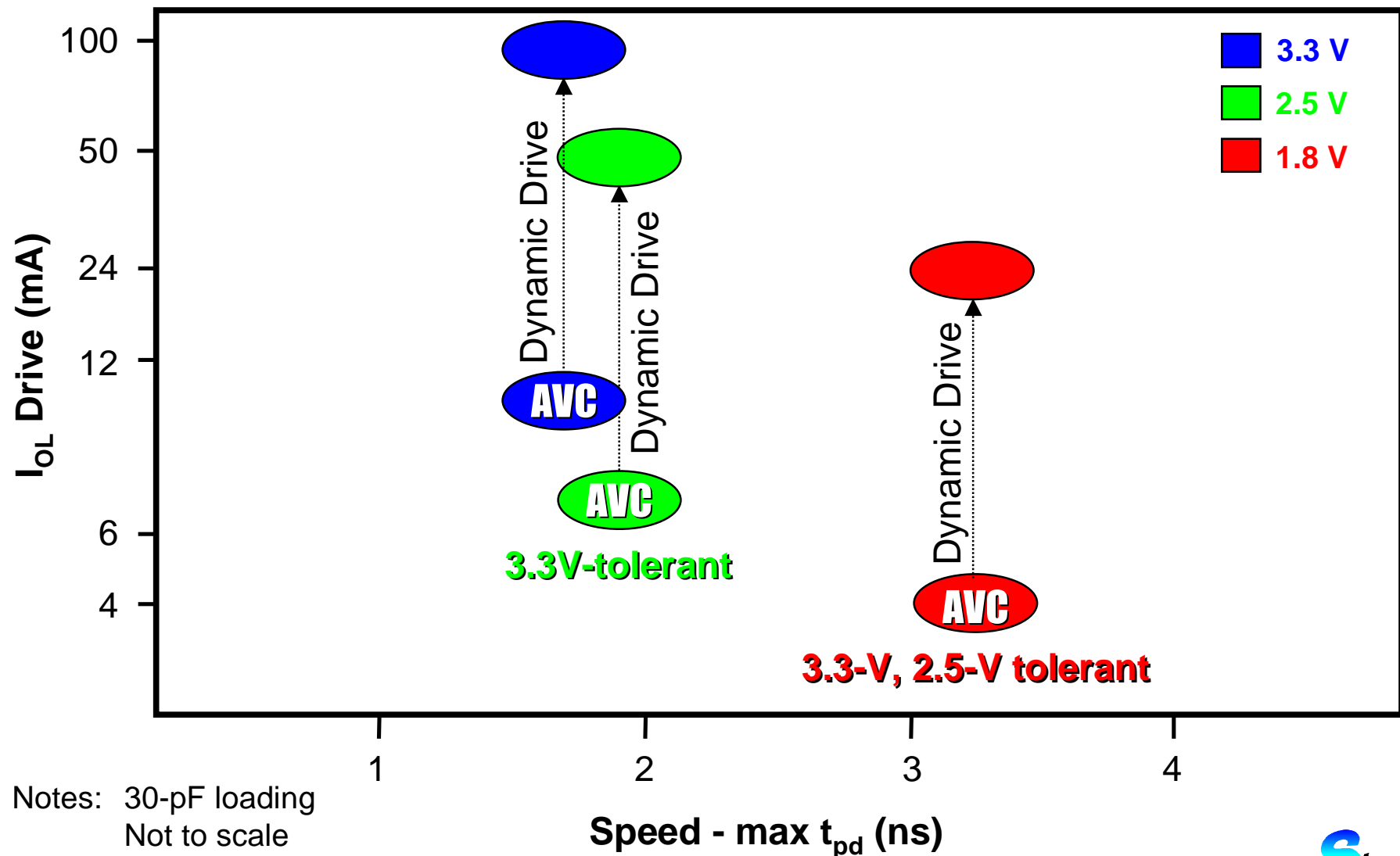
LVT: Low-Voltage BiCMOS

Circuit Features

✦ Mixed-mode 5-V TTL compatible $V_{I/O}$ 7 V max

✦ Live insertion (I_{OFF})

✦ Bus hold ($I_{I(HOLD)}$)

✦ Drive capability -32/64 mA

✦ Low noise

✦ Power on demand

✦ Damping resistor options

✦ ESD protection

Advantages

✦ Largest-selling low voltage

✦ Marketing and applications support

✦ SPICE models

✦ Internal and external second sources

✦ Wide product portfolio

Standard Linear & Logic

LVC: Low-Voltage CMOS

Circuit Features

✦ 5-V tolerant

✦ Live insertion (I_{OFF})

✦ Bus hold ($I_{I(HOLD)}$)

✦ Drive capability
  (-24/24 mA at 3.3-V V_{CC})

✦ Low noise

✦ Damping resistor options

✦ ESD protection

Advantages

✦ Price/performance

✦ Second sources

✦ Broad product offering

✦ Marketing and
  applications support

✦ SPICE models

✦ Gates

✦ No bus hold/damping
  resistors available from
  competitor (LCX)

Standard Linear & Logic

SSTL: Stub Series-Terminated Logic

Characteristics:

- Supports SSTL_3 and LVTTL signal inputs and outputs
- Input threshold = $V_{REF} \pm 0.2$
  $V_{REF} = 1.5$ V
- Drive = ±20 mA
- Interfaces with next-generation SDRAM

Benefits:

- Allows higher system clock rate point-to-point communication speeds of 200 MHz

Considering for next device:

- SSTL Universal Bus Transceivers for data bus
- SSTL registered data multiplexer/exchanger

$V_{DD} \geq V_{DDQ}$

3.3 V — $V_{DDQ} \pm 10\%$

$$V_{OH} = \begin{array}{l} V_{TT} + 0.6 \text{ V (max)} \\ V_{TT} + 0.4 \text{ V (nom)} \\ V_{TT} + 0.32 \text{ V (min)} \\ V_{DDQ} + 0.32 \text{ V (max)} \end{array}$$

1.9 min

1.7 — $V_{IH} = V_{ref} + 0.2$ V (min)

1.5 — $V_{ref} \pm 0.2$ V, $V_{TT} = V_{ref} \pm 0.05$ V

1.3 — $V_{IL} = V_{ref} - 0.2$ V (max)

1.1 max

$$V_{OL} = \begin{array}{l} V_{TT} - 0.32 \text{ V (max)} \\ V_{TT} - 0.6 \text{ V (min)} \\ V_{TT} - 0.4 \text{ V (nom)} \end{array}$$

0 — GND

SSTL_3

Standard Linear & Logic
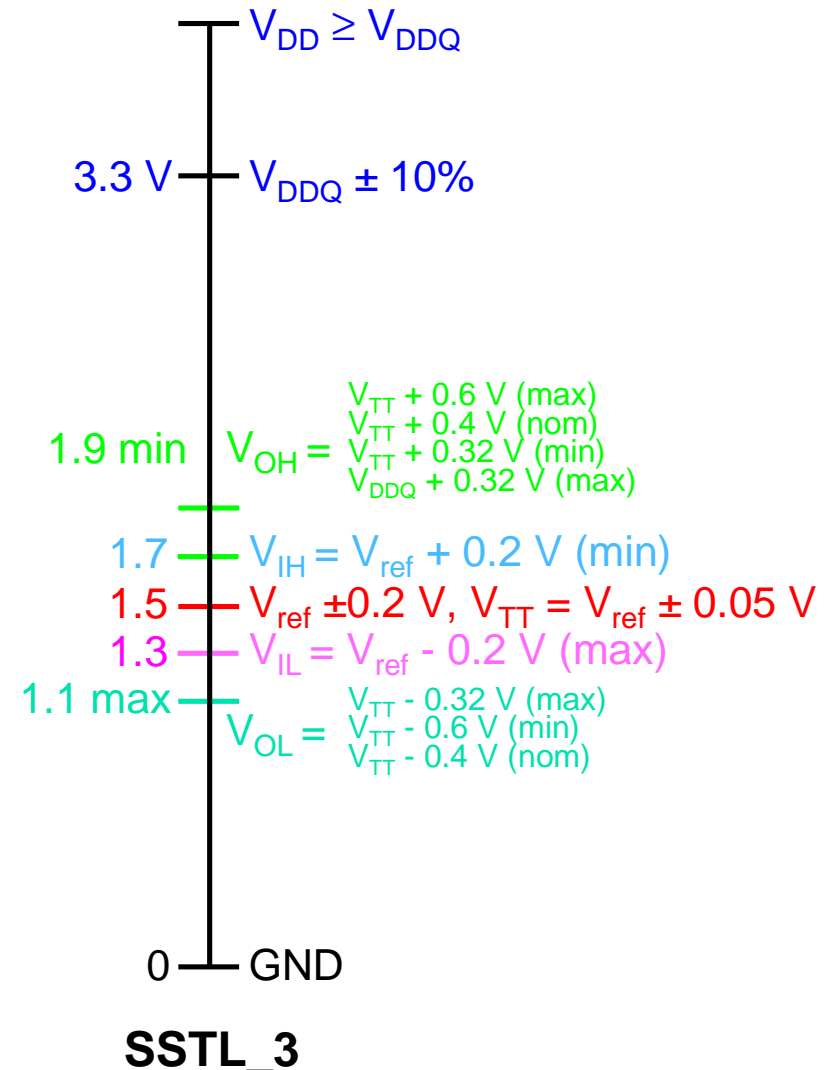
Memory Roadmap With Compatible Logic Families

DRAM	TTL, LVTTL →	ABT, ALVC/DL, DGG
SDRAM	LVTTL, SSTL_3 →	ALVC, SSTL16837/DGG
PC100	LVTTL →	ALVC, SSTL16837/DGG
PC133	LVTTL →	AVC/DGG, BGA
DDR SDRAM	LVTTL, SSTL_2 →	SSTL_2/BGA
RAMBus	Expansion Buffer →	To Be Determined
SLDRAM	SSTL_2? →	To Be Determined

Standard Linear & Logic
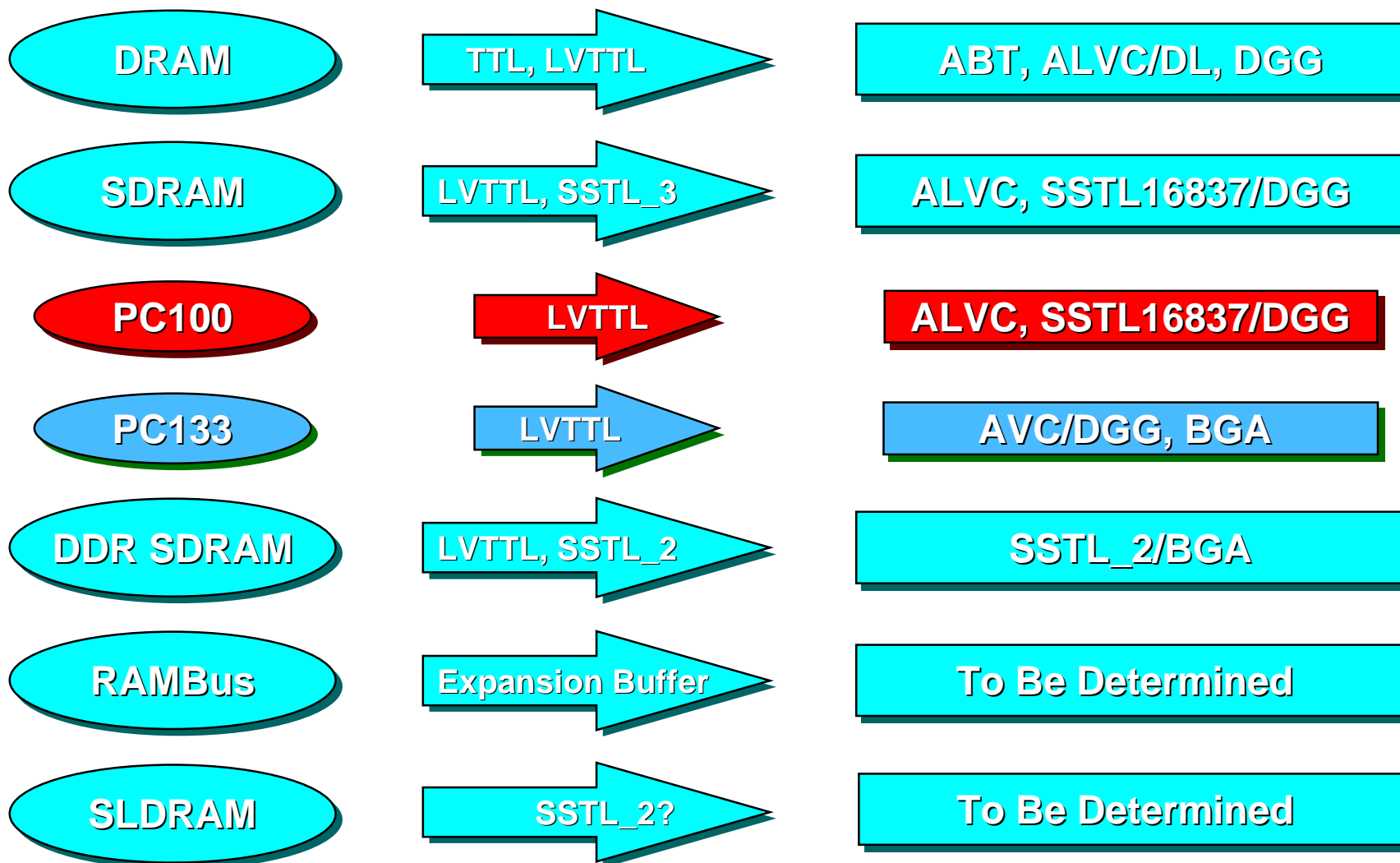
What Is GTL?

✦ Driver is an open-drain n-channel CMOS transistor

✦ Reduced voltage swing reduces power and allows integration into VLSI CMOS

✦ Receiver stage is a differential input with external V_{REF} set at 0.8 V. V_{REF} is derived from simple R/2R voltage divider of 1.2-V pullup.

1.2 V — 25 Ω

1.2 V — V_{OH}
0.85 V_{IH}
0.80 V_t
0.75 V_{IL}
0.40 — V_{OL}
0 — GND

1.2 V V_{IN}
R
2R V_{REF} RCVR

Standard Linear & Logic
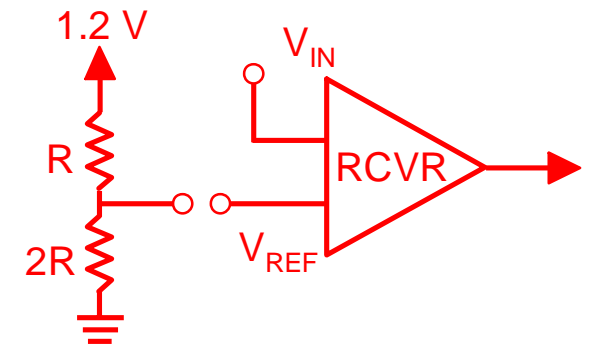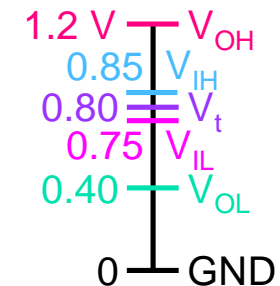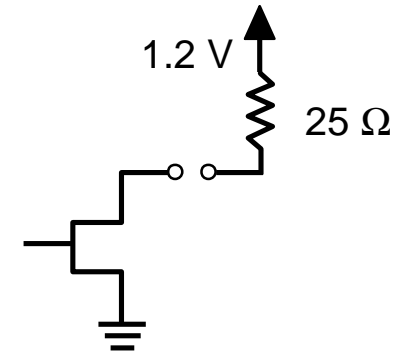
Advantages of GTL

Noise: External V_{REF} provides common-mode noise immunity (derived from 1.2-V pullup)

Low signal amplitude reduces EMI

Speed: Absence of reflections allows higher system clock rate
- Very high-speed point-to-point communication (100+ MHz)
- Backplane speeds over 60 MHz

Power: High-speed, low-power backplane alternative to BTL or ECL

Power Comparison (160 active I/Os)

Technology	Power (watts)	Termination
ECL 10K	20	25 Ω to 3.0 V
BTL	11	16.5 Ω to 2.0 V
GTL	1.5	50 Ω to 1.2 V

Cost: GTL transceivers are less than one-half the cost per bit as BTL drivers of comparable speeds

Standard
Linear &
Logic

What Does TI Offer in IEEE 1149.1 (JTAG) Silicon Solutions?

40+ commercially released devices

IEEE 1149.1 (JTAG) Boundary-Scan Logic Devices

| Octal (8 bit) | Widebus™ (18/20 bit) | Scan-Support Functions |

- **BCT**
- **ABT**

- **ABT/ABTH* (5 V)**
- **LVTH* (3.3 V)**
  - Dual-In-Line (TSSOP)

- LVT8980
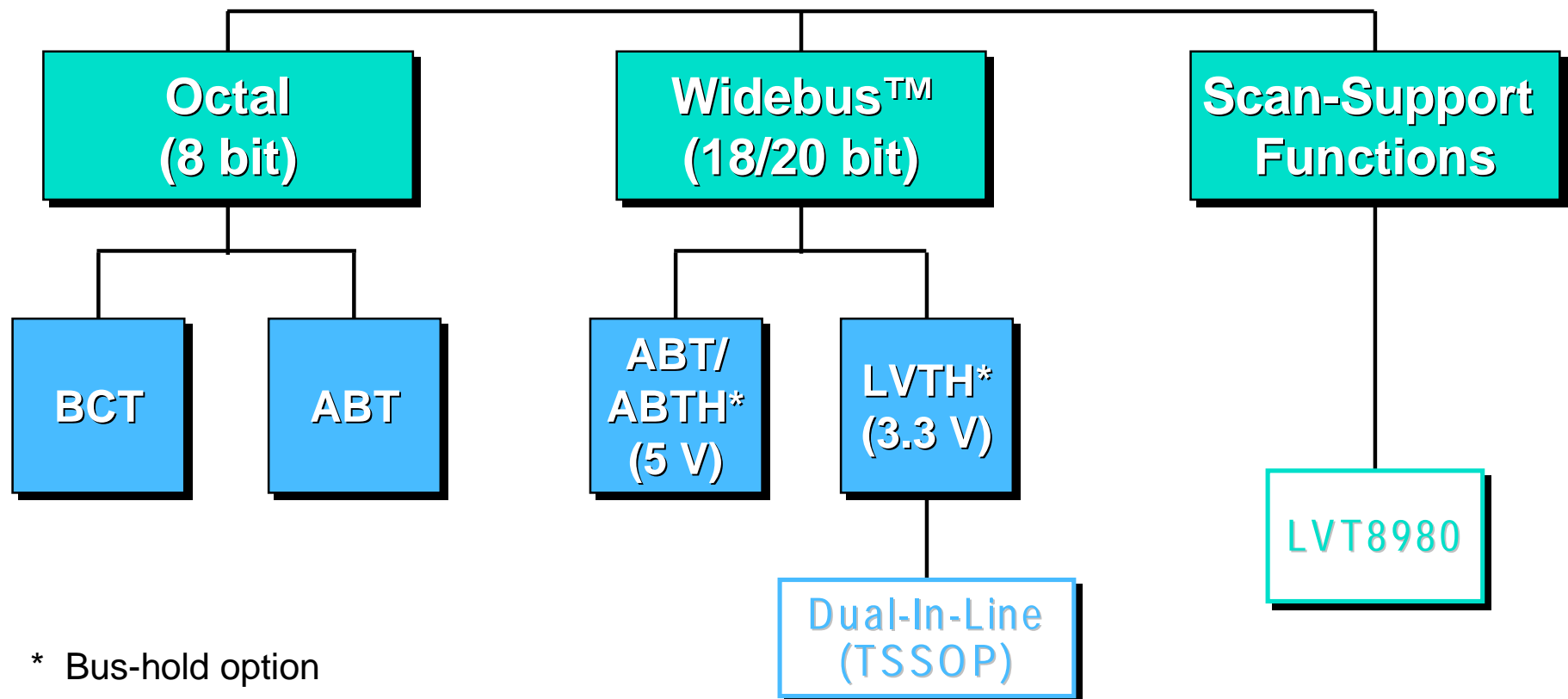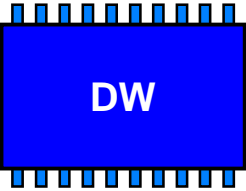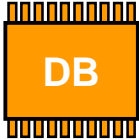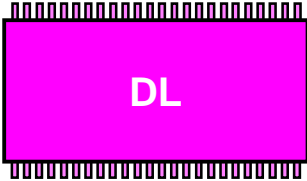
* Bus-hold option

IC Basics
Comparison of Switching Standards

5 V — V_{CC}
4.44 — V_{OH}
3.5 — V_{IH}
2.5 — V_t
1.5 — V_{IL}
0.5 — V_{OL}
0 — GND

5-V CMOS
Rail-to-Rail 5-V
HC, AHC, AC

5 V — V_{CC}
2.4 — V_{OH}
1.6 — V_{IH}
1.5 — V_t
1.4 — V_{IL}
0.4 — V_{OL}
0 — GND

ETL
Larger Noise
Margins - ABTE

5 V — V_{CC}
2.4 — V_{OH}
2.0 — V_{IH}
1.5 — V_t
0.8 — V_{IL}
0.4 — V_{OL}
0 — GND

5-V TTL
Standard TTL - ABT,
AHCT, HCT, ACT, Bipolar

3.3 V — V_{CC}
2.4 — V_{OH}
2.0 — V_{IH}
1.5 — V_t
0.8 — V_{IL}
0.4 — V_{OL}
0 — GND

LVTTL
LVT, LVC,
ALVC, LV, ALVT

2.5 V — V_{CC}
2.3 — V_{OH}
1.7 — V_{IH}
1.2 — V_t
0.7 — V_{IL}
0.2 — V_{OL}
0 — GND

2.5-V CMOS
ALVC,
LVC, ALVT

Standard Linear & Logic

Packaging Options

8 Bits

DW

20-Pin SOIC
Area = 137 mm^2
Ht. = 2.65 mm
LP = 1.27 mm

8 Bits

DB

20-Pin SSOP
Area = 62 mm^2
Ht. = 2.0 mm
LP = 0.65 mm

8 Bits

PW

20-Pin TSSOP
Area = 46 mm^2
Ht. = 1.1 mm
LP = 0.65 mm

16/18 Bits Widebus™

DL

48-Pin SSOP
Area = 171 mm^2
Ht. = 2.74 mm
LP = 0.635 mm

16/18 Bits Shrink Widebus

DGG

48-Pin TSSOP
Area = 108 mm^2
Ht. = 1.1 mm
LP = 0.5 mm

16/18 Bits Widebus

DGV

48-Pin TVSOP
Area = 63 mm^2
Ht. = 1.2 mm
LP = 0.4 mm

Single Gate
(Magnified 2.5X for detail)

DBV

5-Pin SOT
Area = 8.12 mm^2
Ht. = 1.2 mm
LP = 0.95 mm

DCK

5-Pin SOT
Area = 4.2 mm^2
Ht. = 1.0 mm
LP = 0.65 mm

(TI package designators)

32-Bit Ball Grid Array

96-Ball LFBGA
Area = 74.25 mm^2
Ht. = 1.3 mm
LP = 0.8 mm

114-Ball LFBGA
Area = 88 mm^2
Ht. = 1.3 mm
LP = 0.8 mm

Bold indicates TI TTL/CMOS logic packages

DIP — 1
SOIC
Widebus
SSOP
Widebus+
QSOP
Shrink Widebus
TSSOP
TV-SOP
LF-BGA
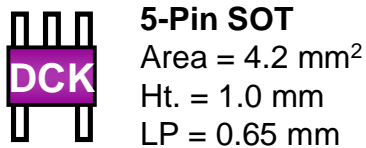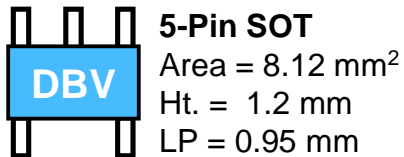
32 Bit
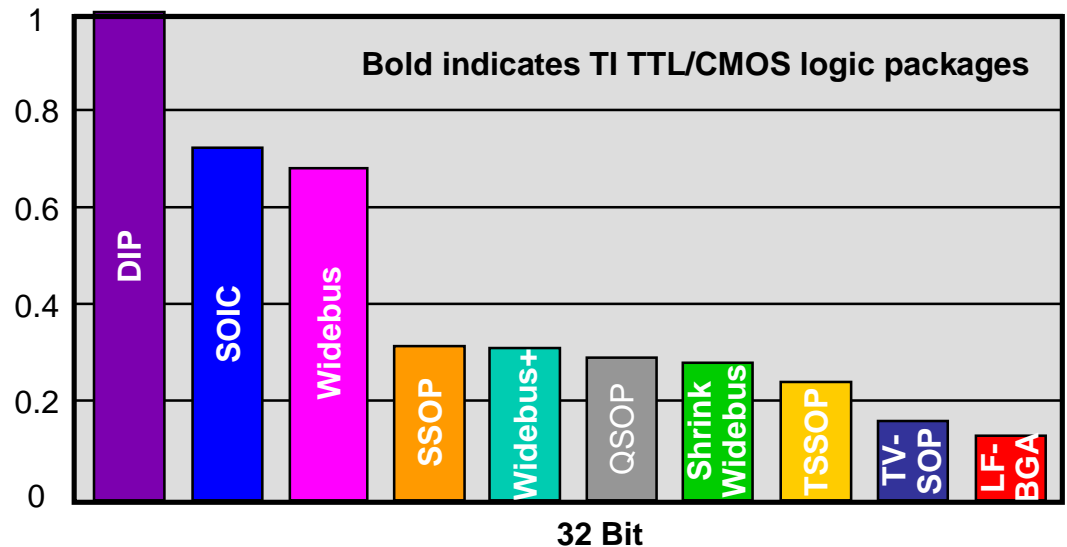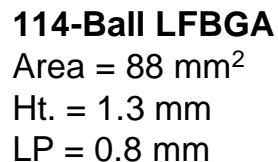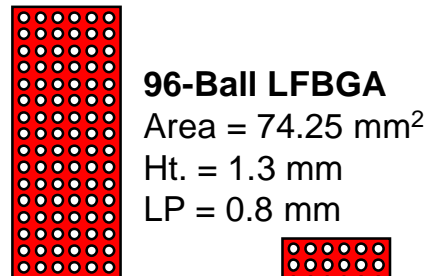
Shrink Widebus and Widebus are trademarks of Texas Instruments Incorporated

Standard Linear & Logic

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BY HARRIS SEMICONDUCTOR   A

2

FUNCTIONAL INDEX

CONTENTS

CONTENTS (continued)

Buffers/Drivers

DESCRIPTION	OUTPUT	TYPE	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	OTHER
Single	3S	'1G125														✔	✔	✛	✛				✛	✛	✔CBT ✛CBTD ✛CBTS ✛CBTLV ✛TVC
		'1G126														✔	✔	✛						✛	
Dual Noninverting	3S	'2G244																	✛						
Quad	3S	'125	✔			✔	✔			✔	✔					✔	✔	✔	✛		✔	✔	✔	✔	✔LVTH
		'126	✔			✔				✔	✔		✱			✔	✔	✔			✔	✔	✔	✔	
Noninverting Hex		'4049																			✔				
	3S	'365									✔		✱								✔	✔			
		'367									✔			✔		✛	✛				✔	✔			
Inverting Hex		'4050																			✔				
	3S	'366																			✔				
	3S	'368									✔			✔							✔	✔			
Noninverting Octal	3S	'241	✔			✔	✔	✔	✔	✔	✔	✔		✔	✔						✔	✔		✛	
		'244	✔			✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✛			✔	✔	✔	✔	
		'1244					✔																✔		
		'541	✔			✔	✔			✔	✔			✔	✔	✔	✔				✔	✔		✔	
	OC	'746					✔																		
		'757							✔																
		'760				✔	✔	✔																	
Inverting Octal	3S	'240	✔			✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔				✔	✔	✔	✔	
		'540	✔			✔		✔			✔			✔	✔	✔	✔				✔	✔	✔	✔	
	OC	'756				✔		✔																	
25-Ω Octal	3S	'25244				✔																			
Inverting and Noninverting Octal	3S	'230							✔																

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✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

BUFFERS/DRIVERS AND BUS TRANSCEIVERS

Buffers/Drivers (continued)

DESCRIPTION	OUTPUT	TYPE	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	OTHER
Octal With Output Series Resistors	3S	'2240	✔			✔		✔																	
		'2241	✔																						
		'2244	✔			✔				✔														✔	
		'2541					✔																		
Noninverting 10 Bit	3S	'827	✔																					✔	
		'29827				✔		✔																	
Inverting 10 Bit	3S	'828																						✔	
		'29828					✔																		
10 Bit With Series Resistors	3S	'2827	✔			✔																			
		'2828				✔																			
11 Bit With Series Resistors	3S	'5400	✔																						
		'5401	✔																						
12 Bit With Series Resistors	3S	'5402	✔																						
		'5403	✔																						
Noninverting 16 Bit	3S	'16241	✔				✤											✤						✤	
		'16244	✔	✔	✔		✔							✔	✔	✔	✔	✔	✤	✤				✔	
		'16541	✔				✤							✔	✔	✔		✤						✔	
Inverting 16 Bit	3S	'16240	✔		✔		✤							✔	✔	✔		✔						✔	
		'16540	✔											✔	✔	✔		✤						✔	
		'16828																			✤				
16 Bit With Series Resistors	3S	'162240				✔												✤							
		'162241				✔																			
		'162244	✔		✔	✔												✔						✔	
		'162541				✔																			
7-Bit IEEE P1284	3S	'1284													✔										
17-Bit IEEE P1284	3S	'161284																					✔	✔	
Noninverting 18 Bit	3S	'16825	✔												✔			✔							
	3S	'16835					✔											✔							

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Buffers/Drivers (continued)

DESCRIPTION	OUTPUT	TYPE	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	OTHER
													TECHNOLOGY												
18 Bit With Series Resistors	3S	'162825	✔																						
Noninverting 20 Bit	3S	'16827	✔		✔										✔			✔	✦	✦					
20 Bit With Series Resistors	3S	'162827	✔		✦													✔							
32 Bit Inverting	3S	'32244																	✦	✦				✦	
1-to-2 Address Drivers	3S	'16830																✦							
1-to-2 Address Drivers With Series Resistors	3S	'162830																✦							✔ALVCHS
1-to-4 Address Drivers	3S	'16344																✔							
		'16831																✔	✦	✦					
		'16832																✔							
1-to-4 Address Drivers With Series Resistors	3S	'162831																✔							
		'162832																✔							

Bus Transceivers

DESCRIPTION	OUTPUT	TYPE	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	OTHER
													TECHNOLOGY												
Noninverting Quad	3S	'243						✔			✔										✔	✔			
Noninverting Octal	3S	'245	✔			✔	✔	✔	✔	✔	✔			✔•	✔•	✔	✔	✦	✔	✔	✔	✔	✔	✔	✦LVTR
		'1245						✔																	
		'25245	✔			✔																			
		'442									✔														
		'645						✔	✔		✔										✔	✔			
		'1645						✔																	
	OC	'621						✔		✱															
		'641						✔	✔		✔														
	OC/3S	'639						✔	✔																

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✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

BUFFERS/DRIVERS AND BUS TRANSCEIVERS

Bus Transceivers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																						
			ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	OTHER
Inverting Octal	3S	'620	✔					✔																	
		'623	✔			✔		✔	✔	✔				✔	✔						✔	✔			
		'640	✔			✔	✔	✔	✔	✔											✔	✔			
		'1640				✔																			
	OC	'642						✔			✔														
	OC/3S	'638						✔																	
Octal With B-Port Series Resistors	3S	'2245	✔			✔				✔														✛	✔LVCR ✔ABTR
Octal 3.3-V-to-5-V Level Shifter	3S	'4245																						✔	✔LVCC
Noninverting Octal With Adjustable Output Voltage	3S	'3245																							✔LVCC
Noninverting 9 Bit	3S	'863	✔																					✔	
		'29863				✔	✔																		
Noninverting 10 Bit	3S	'861	✔																					✔	
Noninverting 16 Bit	3S	'16245	✔	✔	✛		✔							✔	✔	✛	✔	✔	✔	✔				✔	✔ABTE
		'16623	✔												✔										
16 Bit With Series Resistors	3S	'162245	✔		✛		✔											✔							✔LVCR
Noninverting 16-Bit 3.3-V-to-5-V Level Shifter	3S	'164245																✔							
Inverting 16 Bit	3S	'16640	✔																						
		'16620													✔										
Noninverting 18 Bit	3S	'16863	✔												✔			✔							
Noninverting 20 Bit	3S	'16861													✔										
Noninverting 32 Bit	3S	32245	✔																✛	✛				✛	

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✳ Product available as a military device only   * Product planned as a military device

Bus Transceivers With Registers

DESCRIPTION	OUTPUT	TYPE	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Noninverting Octal Registered	3S	'543	✔			✔	✔			✔					•									✔
		'544																						÷
		'646	✔			✔	✔	✔	✔		✔			✔	✔						✔	✔		÷
		'647									✔													
		'652	✔			✔	✔	✔	✔		✔			✔•	✔•						✔	✔		✔
	OC/3S	'653					✔																	
		'654					✔																	
Inverting Octal Registered	3S	'648						✔	✔		✔													
		'651	✔						✔						✔									
Noninverting 16 Bit Registered	3S	'16470	✔																					
		'16543	✔		÷		✔								✔			✔						✔
		'16646	✔				✔								✔				÷	÷				✔
		'16652	✔		÷		✔							✔	✔			÷						✔
Inverting 16 Bit Registered	3S	'16651													✔									
		'16952	✔				✔								✔			÷						✔
Noninverting 18 Bit Registered	3S	'16524																✔						
		'16525																✔						
Noninverting 18 Bit Registered With Series Resistors	3S	'162525																✔						
Noninverting 36 Bit Registered	3S	'32543	✔																					

Bus Transceivers With Latches

DESCRIPTION	OUTPUT	TYPE	ABT	ALB	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	HC	HCT	LV	LVC
Noninverting Octal Registered	3S	'2952	✔			✔															✔
Inverting Octal Registered	3S	'2953			✔																

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✶ Product available as a military device only   * Product planned as a military device

BUFFERS/DRIVERS AND BUS TRANSCEIVERS

Universal Bus Transceivers (UBTs™)/Universal Bus Exchangers (UBEs™)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY									
			ABT	ALVT	AVC	AVCH	BCT	LVT	LV	LVC	ALVC	OTHER
Noninverting 9-Bit 4-Port UBEs	3S	'16409									✔	
Noninverting 9-Bit 4-Port UBEs With Series Resistors	3S	'162409									✔	
16-Bit Universal Bus Drivers	3S	'16334			✛	✛					✔	
16-Bit Universal Bus Drivers With B-Port Series Resistors	3S	'162334									✔	
Noninverting 18-Bit UBTs	3S	'16500	✔					✔			✔	
		'16501	✔	✛	✛	✛		✔			✔	
		'16600	✔								✔	
		'16601	✔	✛	✛	✛					✔	
		'16834			✛	✛					✛	
		'16835			✛	✛		✔			✔	
Noninverting 18-Bit Universal Bus Drivers With Series Resistors	3S	'162834									✔	
Noninverting 20-Bit Universal Bus Drivers	3S	'16836			✛	✛					✔	
Noninverting 36-Bit UBTs	3S	'32501	✔		✛	✛						
Noninverting 16-Bit Tri-Port UBEs	3S	'32316	✔									
Noninverting 18-Bit Tri-Port UBEs	3S	'32318	✔									
18-Bit UBTs With B-Port Series Resistors	3S	'162500	✔									
		'162501	✔									
		'162601	✔								✔	
		'162835									✔	
18-Bit UBTs With A- and B-Port Series Resistors	3S	'162601									✔	✔ALVCHR
Noninverting 18-Bit UBTs With Parity Generators/Checkers	3S	'16901						✔			✔	
18- to-36-Bit Registered Bus Exchangers With Series Resistors	3S	'162282									✔	
20-Bit Universal Bus Drivers With Series Resistors	3S	'162836									✔	

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TEXAS INSTRUMENTS

Parity Transceivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																		
			ABT	ALB	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	HC	HCT	LV	LVC
Octal	3S	'656												•							
	3S	'657	✔						✔												
8-Bit to 9-Bit Bus	3S	'833	✔																		
8/9 Bit With Parity Checkers/Generators	3S	'853	✔																		
	3S/OC	'29833					✔														
		'29834			✔																
		'29854			✔		✔														
16 Bit	3S	'16657	✔											✔							
Dual 8-Bit to 9-Bit Bus	3S	'16833	✔											•							
	3S	'16853	✔																		

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✷ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

BUFFERS/DRIVERS AND BUS TRANSCEIVERS

Non-TTL Buffers/Transceivers/Latches

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY				
			ABTE	FB	GTL	HSTL	SSTL
7-Bit TTL/BTL Transceivers	OC	'2041		✔			
8-Bit TTL/BTL Transceivers	OC	'2040		✔			
8-Bit TTL/BTL Registered Transceivers	OC	'2033		✔			
9-Bit TTL/BTL Competition Transceivers	OC	'2032		✔			
9-Bit TTL/BTL Address/Data Transceivers	OC	'2031		✔			
9-Bit to 18-Bit HSTL-to-LVTTL Memory Address Latches		'16918				✔	
11-Bit Incident-Wave Switching Transceivers	OC	'16246	✔				
14-Bit HSTL-to-LVTTL Memory Address Latches		'162822				✔	
14-Bit SSTL_2 Registered Buffers		'16857					✛
14-Bit SSTL_2 Registered Buffers With SSTL_2 Inputs and LVCMOS Outputs		'16867					✛
14-Bit Registered Buffers With SSTL_2 Inputs and Outputs	3S	'16877					✛
16-Bit LVTTL-to-GTL UBTs With Live Insertion	OD	'1655			✔		
Noninverting 16-Bit Transceivers	OC	'16245	✔				
17-Bit LVTTL-to-BTL Universal Storage Transceivers With Buffered Clock Lines	OC	'1653		✔			
17-Bit TTL/BTL Universal Storage Transceivers	OC	'1651		✔			
Noninverting 17-Bit UBTs With Buffered Clock Outputs and Output Edge Control (OEC™)	OD	'16616			✔		
18-Bit TTL/BTL Universal Storage Transceivers	OC	'1650		✔			
18-Bit LVTTL-to-GTL/GTL+ Registered Transceivers	OC	'16622			✔		
		'16923			✔		
Noninverting 18-Bit UBTs With Output Edge Control (OEC™)	OD	'16612			✔		
20-Bit SSTL_3 Universal Bus Drivers	3S	'16837					✔
20-Bit SSTL_3 Interface Buffer	3S	'16847					✔
26-Bit Registered Buffers With SSTL_2 Inputs and LVCMOS Outputs		'32867					✛
26-Bit Registered Buffers With SSTL_2 Inputs and Outputs		'32877					✛

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![Texas Instruments logo]

Flip-Flops

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																			
			ABT	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Single D-Type	3S	'1G79															✛						✛
Dual J-K Edge Triggered	3S	'73								✔										✔	✔		
		'107								✔										✔	✔		
		'109					✔	✔	✔	✔			✔	✔						✔	✔		
		'112					✔		✔	✔	✔		✔	✔						✔	✔		✔
Dual D-Type		'74					✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✛			✔	✔	✔	✔
Dual 4 Bit D-Type Edge Triggered	3S	'876					✔	✔															
Quad D-Type	3S	'173																		✔	✔		
		'175					✔	✔	✔	✔	✔	✔	✔	✔						✔	✔	✔	
Quad D-Type With Clock Enable		'379								✔													
Quad J-K		'276										✔											
		'376										✔											
Hex D-Type		'174					✔	✔	✔	✔	✔		✔	✔	✔	✔				✔	✔	✔	
		'378								✱													
Octal D-Type True Data	3S	'374	✔		✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✛			✔	✔	✔	✔
		'574	✔		✔	✔	✔	✔	✔				✔	✔	✔	✔				✔	✔	✔	✔
Octal D-Type True Data With Clear		'273	✔			✔	✔			✔		✔	✔	✔	✔	✔				✔	✔	✔	
	3S	'575					✔	✔															
		'874					✔	✔															
Octal D-Type True Data With Clock Enable		'377	✔					✔		✔										✔	✔		
Octal D-Type Inverting	3S	'534	✔				✔						✔	✔						✔	✔		
	3S	'564					✔						✔	✔						✔	✔		
		'576					✔	✔															
Octal Dual Ranked True Data	3S	'4374						✔															

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TEXAS INSTRUMENTS

Flip-Flops (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																			
			ABT	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Octal Inverting With Clear	3S	'577					✔																
Octal True Data	3S	'825						✔															
9 Bit True Data	3S	'823	✔					✔															✔
10 Bit True Data	3S	'821	✔					✔															✔
		'29823			✔	✔																	
10 Bit Noninverting	3S	'16820															✔	÷	÷				
11 Bit True Data	3S	'29821			✔	✔																	
16 Bit Noninverting	3S	'16374		✔		✔							✔	✔	✔	✔	✔	÷	÷				✔
16 Bit D-Type With Series Resistors	3S	'162374				✔											✔						
18 Bit Noninverting	3S	'16823	✔											✔			✔						
18 Bit Bus Interface With Series Resistors	3S	'162823	✔																				
20 Bit With Dual Outputs and Series Resistors	3S	'162820															✔						
20 Bit Noninverting	3S	'16721		÷													✔	÷	÷				
		'16722																÷	÷				
21 Bit Noninverting	3S	'16821	✔	✔													✔	÷	÷				
21 Bit Noninverting With Series-Damping Resistors	OD	'162721															✔						
22 Bit Noninverting With Series-Damping Resistors	OD	'162821															÷						

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TEXAS
INSTRUMENTS

Latches

DESCRIPTION	NO. OF BITS	OUTPUT	TYPE	TECHNOLOGY																				
				ABT	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
D-Type Edge Triggered Inverting and Noninverting	8	3S	'996					✔																
D-Type Transparent Readback, True	8	3S	'990					✔																
	9	3S	'992					✔																
	10	3S	'994					✔																
D-Type Transparent With Clear, True Outputs	8	3S	'666					✔																
D-Type Transparent With Clear, Inverting Outputs	8	3S	'667					✔																
D-Type Transparent True	8	3S	'373	✔		✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✛			✔	✔	✔	✔
		3S	'2373							✔														
		3S	'573	✔		*	✔	✔	✔	✔				✔	✔	✔	✔				✔	✔	✔	✔
	16	3S	'16373	✔	✔		✔							✔	✔	✔	✔	✔	✛	✛				✔
D-Type Dual 4 Bit Transparent True	8	3S	'873					✔	✔															
D-Type Transparent Inverting	8	3S	'533	✔				✔	✔					✔	✔						✔	✔		
	9	3S	'563					✔						✔	✔						✔	✔		
	10	3S	'580					✔																
Addressable	8	2S	'259					✔			✔										✔	✔		
D-Type True Inputs	8	3S	'845					✔																
	9	3S	'843	✔				✔																✛
		3S	'29843			✔																		
	10	3S	'841	✔				✔																✔
		3S	'29841			✔	✔																	
	18	3S	'16843	✔														✛						
	20	3S	'16841	✔											✔									
D-Type True Inputs With Series Resistors	20	3S	'162841	✔											✔			✔						
D-Type	4	3S	'75								✔										✔	✔		

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TEXAS INSTRUMENTS

FLIP-FLOPS AND LATCHES

Latches (continued)

DESCRIPTION	NO. OF BITS	OUTPUT	TYPE	TECHNOLOGY																				
				ABT	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Quad Set/Reset	4	3S	'279								✔	✱												
Bistable	4	3S	'375								✔													
4 × 4 Register File	4	3S	'670								✔										✔	✔		
Dual 16-Word × 4-Bit Register File	4	3S	'870					✔																
D-Type With Series Resistors	16	3S	'162373				✢																	

BUS-TERMINATION ARRAYS

Bus-Termination Arrays

DESCRIPTION	TYPE	TECHNOLOGY		
		F	S	ACT
10 Bit	'1071			✔
16 Bit	'1073			✔
8-Bit Schottky Barrier Diode	'1050		✔	
	'1056	✔	✔	
12-Bit Schottky Barrier Diode	'1051		✔	
16-Bit Schottky Barrier Diode	'1016	✔		
	'1052		✔	
	'1053		✔	

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Bus Switches

DESCRIPTION	TYPE	TECHNOLOGY							
		CBT	CBTS	CBTD	CBTH	CBTLV	HC	HCT	OTHER
Single Bus Switches	'1G125	✔	✤	✤		✤			
	'1G384	✤	✤	✤					
Dual Bus Switches	'3306	✔	✔	✔					
Dual 4-Bit Bus Switches With '244 Pinout	'3244	✔							
Dual 4-Bit-to-1-Bit FET Multiplexers/Demultiplexers	'3253	✔				✤			
Quad 2-to-1-Bit FET Multiplexers/Demultiplexers	'3257	✔				✤			
Quad Analog Switches With Level Translation	'4316						✔	✔	
Quad Bus Switches	'3125	✔				✔			
	'3126	✔				✔			
Quad Bilateral Analog Switches	'4016						✔		
	'4066						✔	✔	✤AHC
8-Bit Bus Switches	'3345	✔							
8-Bit Bus Switches With '245 Pinout	'3245	✔				✔			
8-Bit-to-1-Bit Multiplexers/Data Selectors	'3251	✔				✤			
10-Bit Bus Switches	'3384	✔	✔	✔		✔			
	'3861	✔		✤		✤			
10-Bit Bus-Exchange Switches	'3383	✔			✤	✔			
10-Bit FET Bus Switches With Internal Pulldown Resistors	'3357					✤			
10-Bit Bus-Exchange Switches With Extended Voltage Range	'3386	✤							
10 Bit Bus Switches With Precharged Outputs for Live Insertion	'6800	✔							
12-Bit 3-to-1 Bus Selects	'16214	✔							
12-Bit 1-to-2 FET Multiplexers/Demultiplexers	'16292	✔				✔			
	'162292	✔				✔			
16-Bit Bus Switches	'16244	✔							
16-Bit 1-to-2 Bus Switches	'16390	✔							
Synchronous 16-Bit-to-32-Bit FET Multiplexers	'16232	✔							
16-Bit-to-32-Bit FET Multiplexers/Demultiplexers	'16233	✔							✤CBTR
	'16235					✤			
18-Bit Bus-Exchange Switches With Flow-Through Pinout	'16209	✔							

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BUS SWITCHES

Bus Switches (continued)

DESCRIPTION	TYPE	TECHNOLOGY							
		CBT	CBTS	CBTD	CBTH	CBTLV	HC	HCT	OTHER
20-Bit Bus Switches With Flow-Through Pinout and Level Shifting	'16210	✔		✔		✔			
	'16240			✛					
20-Bit FET Bus Switches	'16801	✛							
20-Bit FET Bus Switches With Precharged Outputs	'16800					✔			
24-Bit Bus-Exchange Switches	'16211	✔	✔	✛	✔	✔			
	'16212	✔	✔		✔	✔			
	'16213	✔	✔						
32-Bit FET Bus Switches	'34X245	✛							
32-Bit FET Bus Switches With Precharged Outputs	'36800	✛							

COUNTERS

Synchronous Counters

DESCRIPTION	PARALLEL LOAD	TYPE	TECHNOLOGY											
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT
Decade Counters/Dividers		'4017											✔	
4 Bit Decade Up/Down	Sync	'190											✔	
		'568	✔											
4 Bit Binary	Sync	'161	✔	✔	✔	✔			✔	✔			✔	✔
	Sync	'163	✔	✔	✔	✔	✔	✳	✔	✔			✔	✔
	Sync	'561	✔											
4 Bit Binary Up/Down	Sync	'191	✔			✔		✳					✔	✔
		'93				✔							✔	✔
		'193	✔			✔			✔				✔	✔
		'293				✔								
		'169	✔	✔	✔	✔	✔							
		'569	✔											
4 Bit Binary Up/Down With Output Registers	Sync	'699				✔								

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Synchronous Counters (continued)

DESCRIPTION	PARALLEL LOAD	TYPE	TECHNOLOGY											
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT
8 Bit Up/Down	Sync	'697				✔								
	Sync Clear	'869	✔	✔										
	Async Clear	'867	✔	✔										
Dual BCD Up	Sync	'4518											✔	
Dual 4 Bit Binary	Sync	'4520											✔	✔
	None	'390				✔							✔	✔
		'393				✔		✶					✔	✔
12 Bit Binary	Async	'4040									✦		✔	✔
14 Bit Binary	Async	'4020											✔	✔
		'4060											✔	✔

Other Counters

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY									
			ALS	AS	F	LS	S	TTL	AHC	AHCT	HC	HCT
4 Bit Up/Down	3S	'669				✔						
Binary With Input Register	3S	'592				✔						
Decade	3S	'90				✔		✶				
Divide by 12	3S	'92				✔		✶				
16 Bit Programmable	3S	'294				✔						
31 Bit Programmable	3S	'292				✔						
Parallel Register Outputs	3S	'590				✔					✔	
Parallel Register Inputs	3S	'593				✔						
7 Stage Binary Ripple		'4024									✔	✔
Programmable Divide-by-N		'4059									✔	
8 Stage Synchronous Down		'40103									✔	✔

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TEXAS INSTRUMENTS

FUNCTIONAL INDEX

SHIFT REGISTERS

Shift Registers

DESCRIPTION	NO. OF BITS	OUTPUT	TYPE	TECHNOLOGY													
				LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV
Cascadable	4	3S	'395					✔									
Dual 4 Stage Static Serial In, Parallel Out	8		'4015												✔		
Octal Storage Registers	8		'396					✔									
Octal Serial In With Output Storage Latches	8		'596					✔									
8-Stage Shift-and-Store Bus Registers	8		'4094												✔	✔	
Parallel In, Parallel Out	4		'195					✔	✔	*					✔		
Parallel In, Parallel Out, Bidirectional	4		'194			✔		✔	✔						✔	✔	
	8		'299	✔			✔	✔	✔		✔	✔			✔	✔	
			'323	✔				✔			✔						
Parallel In, Serial Out	8		'165	✔				✔							✔	✔	
			'166	✔				✔		*					✔	✔	
Serial In, Parallel Out	5		'96					✔									
	8		'164	✔				✔		*	✔	✔			✔	✔	✔
Serial In, Parallel Out With Input Latches	8		'597					✔							✔	✔	
			'598					✔									
Serial In, Parallel Out With Output Latches	8	3S	'594					✔					✢	✢	✔		
		3S	'595					✔					✔	✢	✔		
			'599					✔									
Noninverting	9	3S	'29823	✔	*												
16 Bit Serial In With Output Storage Registers	16		'673					✔									
16 Bit Serial Out	16		'674					✔									

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TEXAS INSTRUMENTS

ENCODERS, DATA SELECTORS/MULTIPLEXERS, AND BUS EXCHANGERS

Encoders, Data Selectors/Multiplexers, and Bus Exchangers

DESCRIPTION	OUTPUT	TYPE	ABT	ALS	ALVT	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LVC	LV	OTHER
Data Selectors/Multiplexers		'150								✔												
Triple 1-of-2 Analog Multiplexers/Demultiplexers	Analog	'4053											✛					✔	✔		✛	
Dual 1-of-4 Analog Multiplexers/Demultiplexers	Analog	'4052																✔	✔			
	Analog	'4352																✔				
1-of-8 Analog Multiplexers/Demultiplexers	Analog	'4051											✛					✔	✔		✛	
	Analog	'4351																✔	✔			
Quad 2-to-1		'157		✔		✔	✔	✔	✔	✔	✔	✔	✔	✔				✔	✔	✔		
		'158		✔		✔	✔	✔	✔		✔	✔	✔	✔				✔	✔	✛		
		'298		✔		✔				✱												
	3S	'257		✔		✔	✔	✔	✔		✔•	✔•	✔	✔				✔	✔	✔		
	3S	'258		✔		✔	✔	✔	✔			✔	✔	✔				✔	✔	✛		
Quad 2-Input Multiplexers		'399						✔														
Hex 2-to-1	3S	'857	✔																			
Dual 4-to-1		'153		✔		✔	✔	✔	✔	✱	✔	✔						✔	✔			
	3S	'253		✔		✔	✔	✔			✔	✔						✔	✔			
4-to-1 Registered Transceivers	3S	'16460	✔																			
4-to-1 Registered Transceivers With Series Resistors	3S	'162460	✔																			
Cascadable Octals		'148						✔		✔								✔				
8-to-1		'151		✔		✔	✔	✔	✔		✔	✔						✔				
	3S	'251		✔			✔	✔	✔	✱		✔						✔	✔			
10-to-4 Line Priority		'147																✔	✔			
8-Input Multiplexers/Registers	3S	'354																✔	✔			
	3S	'356																	✔			
8-to-3 Line Encoders		'348						✔														
9-Bit 4-Port Universal Bus Exchangers		'16409													✔							
12-to-24 Multiplexed	3S	'16260	✔		✛										✔							

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TEXAS INSTRUMENTS

ENCODERS, DATA SELECTORS/MULTIPLEXERS, AND BUS EXCHANGERS

Encoders, Data Selectors/Multiplexers, and Bus Exchangers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																			
			ABT	ALS	ALVT	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LVC	LV	OTHER
12-to-24 Multiplexed With Series Resistors	3S	162260	✔																			
12-to-24 Registered Bus Exchangers	3S	'16269													✔	✛	✛					
		'162269																				✔ALVCHR
		'16270													✔							
12-to-24 Multiplexed Bus Exchangers	3S	'16271													✛							
		'16272													✛							
16-to-1	3S	'250				✔																
16-Channel Analog Multiplexers/Demultiplexers	Analog	'4067																✔	✔			
18-to-36 Registered Bus Exchangers		'16282													✔							
18-to-36 Registered Bus Exchangers With Series Resistors		'162282													✔							
32-to-16 VL Bus Multiplexers		'16254										✔										

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TEXAS INSTRUMENTS

DECODERS/DEMULTIPLEXERS AND OSCILLATORS

Decoders/Demultiplexers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY														
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV	LVC	OTHER
Dual 2-to-4		'139	✔			✔	✔		✔•	✔•	✔	✔	✔	✔		✔	
	OC	'156	✔			✔											
3-to-8		'138	✔	✔	✔	✔	✔		✔•	✔	✔	✔	✔	✔	✔	✔	
		'238							✔	✔			✔	✔			
3-to-8 With Address Registers		'137	✔			✔							✔	✔		✛	
3-to-8 With Address Latches		'237											✔	✔			
4-to-10 BCD-to-Decimal		'42				✔							✔	✔			
	OC	'145				✔		✔									
4-to-16		'154											✔	✔			
4-to-16 With Input Latches		'4514											✔	✔			
		'4515											✔				
BCD-to-7 Segment Latch/Decoder/Driver		'4511											✔	✔			
		'4543											✔	✔			

Oscillators

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY	
			LS	S
Voltage Controlled	2S	'124		✔
		'624	✔	
		'628	✔	
		'629	✔	
Crystal Controlled	2S	'321	✔	

OC = open collector   OD = open drain   3S = 3-state   2S = 2-state

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✶ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

COMPARATORS AND PARITY GENERATORS/CHECKERS

Comparators

INPUT	P = Q	$\overline{P = Q}$	P > Q	$\overline{P > Q}$	P < Q	OUTPUT	ENABLE	TYPE	ALS	AS	F	LS	S	HC	HCT
							DESCRIPTION →					TECHNOLOGY			
4 Bit Binary	No	Yes	No	No	No	2S	Yes	'85				✔	✔	✔	✔
8 Bit With 20-kΩ Pullup	Yes	No	No	No	No	OC	Yes	'518	✔						
	No	Yes	No	No	No	2S	Yes	'520	✔		✔				
	No	Yes	No	Yes	No	2S	No	'682				✔		✔	
8 Bit Standard	No	Yes	No	No	No	2S	Yes	'521	✔		✔				
	No	Yes	No	Yes	No	2S	No	'684				✔		✔	
	No	Yes	No	No	No	2S	Yes	'686				✔			
	No	Yes	No	No	No	2S	Yes	'688	✔			✔		✔	
8 Bit Latched, P Inputs	No	No	Yes	No	Yes	2S	Yes	'885		✔					
12 Bit Address	Yes	No	No	No	No	2S	Yes	'679	✔						

Parity Generators/Checkers

DESCRIPTION	NO. OF BITS	TYPE	ALS	AS	F	LS	S	AC	ACT	HC	HCT
						TECHNOLOGY					
Odd/Even	9	'280	✔	✔	✔	✔	✔	✔	✔	✔	✔
		'286		✔					•		

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✦ New product planned in technology indicated

✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

ARITHMETIC CIRCUITS

Adders

DESCRIPTION	TYPE	TECHNOLOGY						
		F	LS	S	AC	ACT	HC	HCT
4 Bit	'283	✔	✔	✔	✔	✔	✔	✔

Arithmetic Logic Units

DESCRIPTION	TYPE	TECHNOLOGY		
		AS	LS	S
4 Bit	'181	✔	✔	✱
	'381			✔
	'382		✔	

Dividers/Multipliers

DESCRIPTION	TYPE	TECHNOLOGY				
		LS	TTL	ACT	HC	HCT
Binary Rate Multipliers	'97		✔			
Digital Phase-Lock Loop	'297	✔		✔	✔	✔
Phase-Lock Loop With VCO	'4046				✔	✔
Phase-Lock Loop With VCO and Lock Detector	'7046				✔	✔

Monostable Multivibrators

DESCRIPTION	TYPE	TECHNOLOGY						
		LS	TTL	AHC	AHCT	HC	HCT	LV
1 Shot	'121		✔					
Retriggerable	'122	✔						
	'423	✔				✔	✔	
Dual	'221	✔	✔			✔	✔	✛
Dual Retriggerable	'123	✔		✛	✛	✔	✔	✛
Dual Retriggerable Precision	'4538					✔	✔	

✔ Product available in technology indicated • Product available in reduced-noise advanced CMOS (11000 series) ✛ New product planned in technology indicated
✱ Product available as a military device only * Product planned as a military device

GATES

Positive-AND Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Single 2 Input		'1G08									✔	✔	✢						✢
Quad 2 Input		'7001														✔			
		'08	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✔			✔	✔	✔	✔
		'1008		✔															
	OC	'09	✔			✔	✔												
Dual 4 Input		'21	✔	✔	✔	✔										✔	✔		
Triple 3 Input		'11	✔	✔	✔	✔	✔		✔	✔						✔	✔		
Hex 2 Input		'808		✔															
		'1808		✔															

Positive-NAND Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Single 2 Input		'1G00									✔	✔	✢						✢
8 Input		'30	✔	✔	✔	✔	✔	✶								✔	✔		
13 Input		'133	✔				✔												
Dual 4 Input		'20	✔	✔	✔	✔	✔		✔	✔						✔	✔		
Triple 3 Input		'10	✔	✔	✔	✔	✔	✔	✔	✔				✔		✔			✔
Quad 2 Input		'00	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✢		✔	✔	✔	✔
	OC	'01				✔													
		'03	✔			✔	✔									✔	✔		
	3S	'26				✔													
		'37	✔			✔	✔	✔											
	OC	'38	✔		✔	✔	✔	✔											
		'1000		✔															
Quad 2 Input With Schmitt Trigger		'132				✔	✔	✔			✔	✔				✔	✔	✔	

OC = open collector   OD = open drain   3S = 3-state
✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✢ New product planned in technology indicated
✶ Product available as a military device only   * Product planned as a military device

Positive-NAND Gates (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Hex 2 Input		'804	✔	✔															
		'1804		✔															

Positive-OR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Single 2 Input		'1G32									✔	✔	✛						✛
Quad 2 Input		'32	✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✔			✔	✔	✔	✔
		'1032		✔															
	3S	'7032														✔			
Hex 2 Input		'832	✔	✔															
		'1832		✔															
Triple 3 Input		'4075														✔	✔		

Positive-NOR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	AVC	AVCH	HC	HCT	LV	LVC
Single 2 Input		'1G02									✔	✔						✛
Dual 4 Input		4002													✔			
		'25						✔										
Dual 5 Input		'260			✔		✔											
Triple 3 Input		'27	✔	✔	✔	✔		✶							✔	✔		
Quad 2 Input Quad 2 Input		'02	✔	✔	✔	✔	✔	✶	✔	✔	✔	✔			✔	✔	✔	✔
	OC	'33	✔			✔												
		'7002													✔			
Hex 2 Input		'805	✔	✔														
		'1805		✔														

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FUNCTIONAL INDEX

TEXAS INSTRUMENTS

GATES

XOR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY														
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	AVC	AVCH	HC	HCT	LV	LVC
Single 2 Input		'1G86									✔	✔						✛
Quad 2 Input		'86	✔		✔	✔	✔	✔	✔•	✔	✔	✔			✔	✔	✔	✔
Quad 2 Input	OC	'136				✔												

XNOR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY												
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV	LVC
Quad 2 Input	OD	'266				✔							✔			
		'7266											✔			

AND/NOR Gates

DESCRIPTION	TYPE	TECHNOLOGY												
		ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV	LVC
Dual 3 Input	'51				✔	✔									

Complementary Output Elements

DESCRIPTION	TYPE	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV	LVC
Quad	'265					✔									

XOR/XNOR Gates

DESCRIPTION	TYPE	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV	LVC
Quad	'135						✔								

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TEXAS INSTRUMENTS

Inverters/Noninverters

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC
Single Inverters		'1G04									✔	✔	✜	✜					✜
		'1GU04									✔								
	OC	'1G05																	✜
Single Inverters With Schmitt Trigger		'1G14									✔	✔	✜						✜
Hex Inverters		'04	✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✜			✔	✔	✔	✔
		'U04									✔					✔		✔	✔
		'1004	✔	✔															
	OC	'05	✔			✔	✔	✔	✔	✔	✔	✜				✔		✔	
		'1005	✔																
	OC	'06				✔		✔											✔
		'16						✔											
Hex Inverters With Schmitt Trigger		'14				✔		✔	✔	✔	✔	✔	✜			✔	✔	✔	✔
		'19				✔													
Hex Noninverters	OC	'07				✔		✔											✔*
		'17						✔											
		'35	✔																
		'1035	✔																
		'128						✔											
		'140					✔												
		'1034	✔	✔															

Delay Elements

DESCRIPTION	TYPE	TECHNOLOGY												
		ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	HC	HCT	LV	LVC
Hex	'31				✔										

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FUNCTIONAL INDEX

IEEE 1149.1 (JTAG) BOUNDARY-SCAN LOGIC

IEEE 1149.1 (JTAG) Widebus™ With Dual-Sided Terminals

DESCRIPTION	NO. OF BITS	OUTPUT	TYPE	TECHNOLOGY				
				ABT	BCT	LVT	ACT	OTHER
Noninverting Transceivers	18	3S	'18245	✔				
Inverting Transceivers	18	3S	'18640	✔				
UBTs	18	3S	'18512			✔		✔ Bus Hold
			'18516			✛		✛ Bus Hold
	20	3S	'18514			✔		✔ Bus Hold
UBTs With B-Port Series Resistors	18	3S	'182512			✔		✔ Bus Hold
			'182516			✛		✛ Bus Hold
	20	3S	'182514			✛		✛ Bus Hold

IEEE 1149.1 (JTAG) Widebus™ With Quad-Sided Terminals

DESCRIPTION	NO. OF BITS	OUTPUT	TYPE	TECHNOLOGY				
				ABT	BCT	LVT	ACT	OTHER
Registered Transceivers	18	3S	'18646	✔		✔		✔ Bus Hold
			'18652	✔		✔		✔ Bus Hold
Registered Transceivers With B-Port Series Resistors	18	3S	'182646	✔		✔		✔ Bus Hold
			'182652	✔		✔		✔ Bus Hold
UBTs	18	3S	'18502	✔		✔		✔ Bus Hold
	20	3S	'18504	✔		✔		✔ Bus Hold
UBTs With B-Port Series Resistors	18	3S	'182502	✔		✔		✔ Bus Hold
	20	3S	'182504	✔		✔		✔ Bus Hold

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TEXAS INSTRUMENTS

IEEE 1149.1 (JTAG) Octal Bus Interface

DESCRIPTION	NO. OF BITS	OUTPUT	TYPE	TECHNOLOGY				
				ABT	BCT	LVT	ACT	OTHER
Inverting Buffers/Drivers	8	3S	'8240		✔			
Noninverting Buffers/Drivers	8	3S	'8244		✔			
Transceivers	8	3S	'8245	✔	✔			
Registered Transceivers	8	3S	'8543	✔				
			'8646	✔				
			'8652	✔				
			'8952	✔				
D-Type Transparent Latches	8	3S	'8373		✔			
D-Type Flip-Flops	8	3S	'8374		✔			

IEEE 1149.1 (JTAG) Scan Support

DESCRIPTION	TYPE	TECHNOLOGY				
		ABT	BCT	LVT	ACT	OTHER
Test Bus Controllers	'8980			✔		
	'8990				✔	
Digital Bus Monitors	'8994				✔	
Addressable Scan-Port Devices	'8996	✔		✢		
Scan-Path Linkers	'8997				✔	
Scan-Path Selectors	'8999				✔	

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TEXAS INSTRUMENTS

FIFO MEMORIES

First-In, First-Out (FIFO) Memories

DESCRIPTION		OUTPUT	TYPE	TECHNOLOGY							
SIZE	OPTION			ABT	ALS	LS	S	ACT	ALVC	HC	HCT
16 × 4 Bits	U	3S	'224			✔					
			'232		✔						
			'40105							✔	✔
16 × 5 Bits	U	3S	'225				✔				
			'233		✔						
64 × 4 Bits	U		'236		✔						
64 × 18 Bits	U, S	3S	'7813					✔	✔		
	U, A	3S	'7814					✔	✔		
64 × 36 Bits	B, S	3S	'3612	✔							
			'3614	✔							
	U, S	3S	'3611	✔							
			'3613	✔							
Dual 64 × 1	S	3S	'2226					✔			
			'2227					✔			
Dual 256 × 1	S	3S	'2228					✔			
			'2229					✔			
256 × 18 Bits	U, S	3S	'7805					✔	✔		
257 × 18 Bits	U, A	3S	'7806					✔	✔		
256 × 36 Bits × 2	B, S	3S	'3622					✔			
512 × 18 Bits	U, S	3S	'7803					✔	✔		
	U, A	3S	'7804					✔	✔		
	B, S	3S	'7819	✔							
	B, A	3S	'7820	✔							
512 × 32 Bits	B, S	3S	'3638					✔			
512 × 36 Bits	U, S	3S	'3631					✔			
513 × 36 Bits	B, S	3S	'3632					✔*			

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✶ Product available as a military device only   * Product planned as a military device

A = Asynchronous
B = Bidirectional
S = Synchronous
U = Unidirectional

TEXAS
INSTRUMENTS

First-In, First-Out (FIFO) Memories (continued)

DESCRIPTION		OUTPUT	TYPE	TECHNOLOGY							
SIZE	OPTION			ABT	ALS	LS	S	ACT	ALVC	HC	HCT
1K × 9 Bits	B, A	3S	'2235					✔			
1K × 18 Bits	U, S	3S	'7811					✔			
			'7881					✔			
	U, A	3S	'7802					✔			
1K × 36 Bits	U, S	3S	'3641					✔			
2K × 9 Bits	U, S	3S	'7807					✔			
	U, A	3S	'7808					✔			
2K × 18 Bits	U, S	3S	'7882					✔			
2K × 36 Bits	U, S	3S	'3651					✔	✛		

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U = Unidirectional

TRANSLATION VOLTAGE CLAMPS

Translation Voltage Clamps

DESCRIPTION	TYPE	TECHNOLOGY
		TVC
10 Bit	'3010	✛
22 Bit	'16222	✛

3

FUNCTIONAL CROSS-REFERENCE

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'1G00														✔	✔	✛						✛	
'1G02														✔	✔							✛	
'1G04														✔	✔	✛						✛	
'1GU04														✔									
'1G05																						✛	
'1G08														✔	✔	✛						✛	
'1G14														✔	✔	✛						✛	
'1G32														✔	✔	✛						✛	
'1G79																✛						✛	
'1G86														✔	✔							✛	
'1G125														✔	✔	✛						✛	✔CBT ✛CBTD,S ✔CBTLV
'1G126														✔	✔	✛						✛	
'1G384																							✛CBTD,S
'00						✔	✔	✔	✔	✔	✔	✔•	✔	✔	✔	✔	✛	✛	✔	✔	✔	✔	
'01									✔		✱												
'02						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		✛	✛	✔	✔	✔	✔	
'03						✔			✔	✔									✔	✔			
'04						✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✔	✛	✛	✔	✔	✔	✔	
'U04														✔					✔		✔	✔	
'05						✔			✔	✔	✔	✔	✔	✔	✛				✔	✔			
'06									✔		✔											✔	
'07									✔		✔											✔	
'08						✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✔	✛	✛	✔	✔	✔	✔	
'09						✔			✔	✔													
'10						✔	✔	✔	✔	✔	✔	✔	✔				✔		✔	✔		✔	
'11						✔	✔	✔	✔	✔		✔	✔						✔	✔			
'14									✔		✔	✔	✔	✔	✔	✛	✛	✛	✔	✔	✔	✔	
'16											✔												
'17											✔												

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TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'19									✔														
'20						✔	✔	✔	✔	✔		✔	✔						✔	✔			
'21						✔	✔	✔	✔										✔	✔			
'25											✔												
'26									✔														
'27						✔	✔	✔	✔		✴								✔	✔			
'30						✔	✔	✔	✔	✔	✴								✔	✔			
'31									✔														
'32						✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✔	✛	✛	✔	✔	✔	✔	
'33						✔			✔														
'35						✔																	
'37						✔			✔	✔	✔												
'38						✔		✔	✔	✔	✔												
'42									✔										✔	✔			
'45											✔												
'47									✔		✔												
'51									✔	✔	✴												
'73									✔										✔	✔			
'74						✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✛			✔	✔	✔	✔	
'75									✔										✔	✔			
'85									✔	✔									✔	✔			
'86						✔	✴	✔	✔	✔	✔	✔•	✔	✔	✔				✔	✔	✔	✔	
'90									✔		✴												
'92									✔		✴												
'93									✔										✔	✔			
'96									✔														
'97											✔												
'107									✔		✴								✔	✔			
'109						✔	✔	✔	✔			✔	✔						✔	✔			
'112						✔		✔	✔	✔		✔	✔						✔	✔		✔	

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✴ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'121											✔												
'122									✔		✶												
'123									✔		✔			✢	✢				✔	✔	✢		
'124										✔													
'125	✔			✔	✔			✔	✔					✔	✔	✔	✢	✢	✔	✔	✔	✔	✔LVTH
'126	✔			✔				✔	✔		✶			✔	✔	✔			✔	✔	✔	✔	
'128											✔												
'132									✔	✔	✔			✔	✔				✔	✔	✔		
'133						✔					✔												
'135											✔												
'136									✔														
'137						✔			✔										✔	✔		✢	
'138						✔	✔	✔	✔	✔		✔•	✔	✔	✔				✔	✔	✔	✔	
'139						✔			✔	✔		✔•	✔•	✔	✔				✔	✔	✔	✔	
'140											✔												
'145									✔		✔												
'147																			✔	✔			
'148									✔		✔								✔				
'150											✔												
'151						✔	✔	✔	✔	✔		✔	✔						✔	✔			
'153						✔	✔	✔	✔	✔	✶	✔	✔						✔	✔			
'154											✔								✔	✔			
'155									✔		✶												
'156						✔			✔														
'157						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔				✔	✔		✔	
'158						✔	✔	✔	✔	✔		✔	✔	✔	✔				✔	✔		✢	
'159											✔												
'161						✔	✔	✔	✔			✔	✔						✔	✔			
'163						✔	✔	✔	✔	✔	✶	✔	✔						✔	✔			
'164						✔			✔		✶	✔	✔						✔	✔	✔		

✔ Product available in technology indicated • Product available in reduced-noise advanced CMOS (11000 series) ✢ New product planned in technology indicated

✶ Product available as a military device only ✶ Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'165						✔			✔										✔	✔	✔		
'166						✔			✔		✶								✔	✔			
'169						✔	✔	✔	✔	✔													
'170									✔														
'173									✔		✶								✔	✔			
'174						✔	✔	✔	✔	✔		✔	✔	✔	✔				✔	✔	✔		
'175						✔	✔	✔	✔	✔	✔	✔	✔	✣					✔	✔	✔		
'181							✔		✔	✶													
'182									✔														
'190																			✔				
'191						✔			✔		✶								✔	✔			
'192																			✔				
'193						✔			✔		✔								✔	✔			
'194							✔		✔	✔									✔	✔			
'195									✔	✔	✶								✔				
'221									✔		✔								✔	✔	✣		
'224									✔														See FIFO
'230							✔																
'232						✔																	See FIFO
'233						✔																	See FIFO
'236						✔																	See FIFO
'237																			✔	✔			
'238												✔	✔						✔	✔			
'240	✔			✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔		✣	✣	✔	✔	✔	✔	
'241	✔			✔	✔		✔	✔	✔	✔		✔	✔						✔	✔		✣	✔LVTH
'243						✔			✔										✔	✔			
'244	✔			✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✔	✣	✣	✔	✔	✔	✔	
'245	✔			✔	✔	✔	✔	✔	✔			✔•	✔•	✔	✔	✣	✣	✣	✔	✔	✔	✔	
'247									✔														
'250							✔																

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✣ New product planned in technology indicated
✶ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'251						✔		✔	✔	✔	✶	✔	✔						✔	✔			
'253						✔	✔	✔	✔			✔	✔						✔	✔			
'257						✔	✔	✔	✔	✔		✔•	✔•	✢	✢				✔	✔		✔	
'258						✔	✔	✔	✔	✔		✔	✔	✢	✢				✔	✔		✢	
'259						✔			✔										✔	✔			
'260								✔		✔													
'265											✔												
'266									✔										✔				
'273	✔				✔	✔			✔		✔	✔	✔	✔	✔				✔	✔	✔		
'276											✔												
'279									✔		✶												
'280						✔	✔	✔	✔	✔		✔	✔						✔	✔			
'283								✔	✔	✔		✔	✔						✔	✔			
'286							✔						•										
'292									✔														
'293									✔														
'294									✔														
'297									✔										✔	✔			
'298							✔		✔		✶												
'299						✔		✔	✔	✔		✔	✔						✔	✔			
'321									✔														
'323						✔			✔			✔	✔										
'348									✔														
'354																			✔	✔			
'356																				✔			
'365									✔		✶								✔	✔			
'367									✔		✔			✔	✔				✔	✔			
'368									✔		✔								✔	✔			
'373	✔			✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✢	✢	✢	✔	✔	✔	✔	
'374	✔			✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✢	✢	✢	✔	✔	✔	✔	

✔ Product available in technology indicated • Product available in reduced-noise advanced CMOS (11000 series) ✢ New product planned in technology indicated
✶ Product available as a military device only * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'375									✔														
'376											✔												
'377	✔							✔	✔										✔	✔			
'378									✔														
'379									✱														
'381										✔													
'382									✔														
'390									✔										✔	✔			
'393									✔		✔			✛	✛				✔	✔			
'395									✔														
'396									✔														
'399									✔														
'423									✔										✔	✔			
'442									✔														
'465									✔														
'518						✔																	
'520						✔		✔					•										
'521						✔		✔															
'533	✔					✔	✔					✔	✔						✔	✔			
'534	✔					✔						✔	✔						✔	✔			
'540	✔			✔		✔			✔			✔	✔	✔	✔				✔	✔	✔	✔	
'541	✔			✔		✔		✔	✔			✔	✔	✔	✔				✔	✔	✔	✔	
'543	✔			✔	✔	✔							•									✔	
'544																						✛	
'561						✔																	
'563						✔						✔	✔						✔	✔			
'564						✔						✔	✔						✔	✔			
'568						✔																	
'569						✔																	
'573	✔			✱	✔	✔	✔	✔				✔	✔	✔	✔				✔	✔	✔	✔	

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✱ Product available as a military device only   * Product planned as a military device

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'574	✔			✔	✔	✔	✔	✔				✔	✔	✔	✔				✔	✔	✔	✔	
'575						✔	✔																
'576						✔	✔																
'577						✔																	
'580						✔																	
'590									✔										✔				
'592									✔														
'593									✔														
'594									✔					✔	✔				✔		✔		
'595									✔					✔	✔				✔		✔		
'596									✔														
'597									✔										✔	✔			
'598									✔														
'599									✔														
'620	✔			✱		✔																	
'621						✔		✱															
'623	✔			✔		✔		✔	✔			✔	✔						✔	✔			
'624									✔														
'628									✔														
'629									✔														
'638						✔																	
'639						✔	✔																
'640	✔			✔		✔	✔		✔										✔	✔			
'641						✔	✔		✔														
'642						✔			✔														
'645						✔	✔		✔										✔	✔			
'646	✔			✔	✔	✔	✔		✔			✔	✔						✔	✔		✔	
'647									✔														
'648						✔	✔		✔														
'651	✔						✔						✔										

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✦ New product planned in technology indicated
✱ Product available as a military device only   * Product planned as a military device

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'652	✔			✔	✔	✔	✔		✔			✔•	✔•						✔	✔		✔	
'653						✔																	
'654						✔																	
'656													•										
'657	✔							✔															
'666						✔																	
'667						✔																	
'669									✔														
'670									✔										✔	✔			
'673									✔														
'674									✔														
'679						✔																	
'682									✔										✔				
'684									✔										✔				
'686									✔														
'688						✔			✔										✔	✔			
'697									✔														
'699									✔														
'746						✔																	
'756				✔			✔																
'757							✔																
'760				✔		✔	✔																
'804						✔	✔																
'805						✔	✔																
'808							✔																
'821	✔						✔															✔	
'823	✔						✔															✔	
'825							✔																
'827	✔																					✔	
'828																						✔	

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated

✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'832						✔	✔																
'833	✔																						
'841	✔					✔																✔	
'843	✔					✔																✜	
'845						✔																	
'853	✔																						
'857						✔																	
'861	✔																					✔	
'863	✔																					✔	
'867						✔	✔																
'869						✔	✔																
'870						✔																	
'873						✔	✔																
'874						✔	✔																
'876						✔	✔																
'885							✔																
'990						✔																	
'992						✔																	
'994						✔																	
'996						✔																	
'1000							✔																
'1004						✔	✔																
'1005						✔																	
'1008							✔																
'1016								✔															
'1032							✔																
'1034						✔	✔																
'1035						✔																	
'1050										✔													
'1051										✔													

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✜ New product planned in technology indicated

✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'1052										✔													
'1053										✔													
'1056								✔		✔													
'1071													✔										
'1073													✔										
'1244						✔																	
'1245						✔																	
'1284													✔										
'1640						✔																	
'1645						✔																	
'1650																							✔FB+
'1651																							✔FB+
'1653																							✔FB+
'1655																							✔GTL
'1804							✔																
'1805							✔																
'1808							✔																
'1832							✔																
'2031																							✔FB+
'2032																							✔FB+
'2033																							✔FB+
'2040																							✔FB+
'2041																							✔FB+
'2226													✔										See FIFO
'2227													✔										See FIFO
'2228													✔										See FIFO
'2229													✔										See FIFO
'2235													✔										See FIFO
'2240	✔			✔		✔																	
'2241	✔																						

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✚ New product planned in technology indicated
✖ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'2244	✔			✔				✔														✔	
'2245	✔			✔	✔			✔														✛	✔ABTR ✔LVCR ✛LVTR
'2373								✔															
'2541						✔																	
'2827	✔			✔																			
'2828				✔																			
'2952	✔				✔																	✔	
'2953				✔																			
'3010																							✛TVC
'3125																							✔CBT ✔CBTLV
'3126																							✔CBT ✔CBTLV
'3244																							✔CBT
'3245																							✔CBT ✔CBTLV ✔LVCC
'3251																							✔CBT ✛CBTLV
'3253																							✔CBT ✛CBTLV
'3257																							✔CBT ✛CBTLV
'3306																							✔CBT,D,S
'3345																							✔CBT
'3383																							✔CBT ✔CBTLV
'3384																							✔CBT,D,S ✔CBTLV
'3386																							✛CBT
'3611	✔																						See FIFO

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated

✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'3612	✔																						See FIFO
'3613	✔																						See FIFO
'3614	✔																						See FIFO
'3622													✔										See FIFO
'3631													✔										See FIFO
'3632													✔										See FIFO
'3638													✔										See FIFO
'3641													✔										See FIFO
'3651													✔			✛							See FIFO
'3857																							✔CBT,D ✛CBTLV
'3861																							✔CBT,D ✛CBTLV
'4002																			✔				
'4015																			✔				
'4016																			✔				
'4017																			✔				
'4020																			✔	✔			
'4024																			✔	✔			
'4040														✛					✔	✔	✛		
'4046																			✔	✔			
'4049																			✔				
'4050																			✔				
'4051														✛					✔	✔	✛		
'4052																			✔	✔			
'4053														✛					✔	✔	✛		
'4059																			✔				
'4060																			✔	✔			
'4066														✛					✔	✔	✛		
'4067																			✔	✔			
'4075																			✔	✔			

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✳ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'4094																			✔	✔			
'4245																						✔	✔LVCC
'4316																			✔	✔			
'4351																			✔	✔			
'4352																			✔				
'4374							✔																
'4511																			✔	✔			
'4514																			✔	✔			
'4515																			✔				
'4518																			✔				
'4520																			✔	✔			
'4538																			✔	✔			
'4543																			✔	✔			
'5400	✔																						
'5401	✔																						
'5402	✔																						
'5403	✔																						
'6800																							✔CBT
'7001																			✔				
'7002																			✔				
'7032																			✔				
'7046																			✔	✔			
'7266																			✔				
'7802													✔										See FIFO
'7803													✔			✔							See FIFO
'7804													✔			✔							See FIFO
'7805													✔			✔							See FIFO
'7806													✔			✔							See FIFO
'7807													✔										See FIFO
'7808													✔										See FIFO

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated

✱ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'7811													✔										See FIFO
'7813													✔			✔							See FIFO
'7814													✔			✔							See FIFO
'7819	✔																						See FIFO
'7820	✔																						See FIFO
'7881													✔										See FIFO
'7882													✔										See FIFO
'8240				✔																			
'8244				✔																			
'8245	✔			✔																			See JTAG
'8373				✔																			
'8374				✔																			
'8543	✔																						See JTAG
'8646	✔																						See JTAG
'8652	✔																						See JTAG
'8952	✔																						See JTAG
'8980					✔																		See JTAG
'8990													✔										See JTAG
'8994													✔										See JTAG
'8996	✔				✛																		See JTAG
'8997													✔										See JTAG
'8999													✔										See JTAG
'11000												✔											
'11004												✔	✔										
'11008												✔	✔										
'11032												✔	✔										
'11074												✔	✔										
'11086												✔											
'11138												✔											
'11139												✔	✔										

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✶ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'11240												✔	✔										
'11244												✔	✔										
'11245												✔	✔										
'11257												✔	✔										
'11286													✔										
'11373												✔	✔										
'11374												✔	✔										
'11520												✔											
'11543													✔										
'11652												✔	✔										
'11656													✔										
'16209																							✔CBT
'16210																							✔CBT,D ✔CBTLV
'16211																							✔CBT,D,S,H ✔CBTLV
'16212																							✔CBT,S,H ✔CBTLV
'16213																							✔CBT ✛CBTS
'16214																							✔CBT
'16215																							✛CBTLV
'16222																							✛TVC
'16232																							✔CBT
'16233																							✔CBT ✛CBTR
'16235																							✛CBTLV
'16240	✔		✛		✔							✔	✔	✔	✔	✔						✔	
'16241	✔				✔								✔									✛	
'16244	✔	✔	✔		✔							✔	✔	✔	✔	✔	✛	✛				✔	✔*CBT

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated

✸ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'16245	✔	✔	✛		✔							✔	✔	✔	✔	✔	✛	✛				✔	✔ABTE ✔LVTH ✛ALVTHR
'16246																							✔ABTE
'16254													✔										
'16260	✔		✛													✔							
'16269																✔	✛	✛					✔ALVCHR
'16270																✔							
'16271																✔							
'16282																✔							
'16292																							✔CBT ✔CBTLV
'16334																✔	✛	✛					
'16344																✔							
'16373	✔		✔		✔							✔	✔	✔	✔	✔	✛	✛				✔	
'16374	✔		✔		✔							✔	✔	✔	✔	✔	✛	✛				✔	
'16390																							✔CBT
'16409																✔							
'16460	✔																						
'16470	✔												✔										
'16472												✔											
'16474													✔										
'16475													✔										
'16500	✔				✔											✔							✔LVTH
'16501	✔		✛		✔											✔	✛	✛					✔LVTH
'16524																✔							
'16525																✔							
'16540	✔												✔	✔	✔							✔	
'16541	✔				✛								✔	✔	✔							✔	
'16543	✔		✛		✔							✔	✔			✔						✔	
'16544													✔										

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated

✱ Product available as a military device only   * Product planned as a military device

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'16600	✔															✔							
'16601	✔		✛													✔	✛	✛					
'16612																							✔GTL
'16616																							✔GTL
'16620												✔	✔										
'16622																							✔GTL
'16623	✔												✔										
'16640	✔											✔	✔										
'16646	✔				✔							✔	✔				✛	✛				✔	
'16648													✔										
'16651													✔										
'16652	✔		✛		✔							✔	✔									✔	
'16657	✔												✔										
'16721			✛													✔	✛	✛					
'16722																	✛	✛					
'16800																							✔CBTLV
'16820																✔	✛	✛					
'16821	✔		✔										✔			✔	✛	✛					
'16823	✔											✔	✔			✔							✔ALVCH
'16825	✔												✔			✔							
'16827	✔		✔										✔			✔	✛	✛					
'16831																✔	✛	✛					
'16832																✔							
'16833	✔												✔										
'16834																✔							
'16835					✔											✔	✛	✛					✔LVTH
'16836																	✛	✛					
'16837																							✔SSTL
'16841	✔												✔			✔							
'16843	✔																						

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✶ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'16847																							✔SSTL
'16853	✔																						
'16857																							✤SSTL
'16861													✔										✤CBT
'16863	✔												✔			✔							
'16864													✔										
'16867																							✤SSTL
'16877																							✤SSTL
'16901																✔						✔	
'16918																							✔HSTL
'16923																							✔GTL
'16952	✔				✔*								✔			✔						✔	
'18245	✔																						See JTAG
'18502	✔				✔																		See JTAG
'18504	✔				✔																		See JTAG
'18512					✔																		See JTAG
'18514					✔																		See JTAG
'18516					✤																		See JTAG
'18640	✔																						See JTAG
'18646	✔				✔																		See JTAG
'18652	✔				✔																		See JTAG
'25244				✔																			
'25245	✔			✔																			
'29821				✔		✔																	
'29823				✔		✔																	
'29827				✔		✔																	
'29828						✔																	
'29833						✔																	
'29834				✔																			
'29841				✔		✔																	

✔ Product available in technology indicated   ● Product available in reduced-noise advanced CMOS (11000 series)   ✤ New product planned in technology indicated
✶ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'29843				✔																			
'29854				✔		✔																	
'29863				✔		✔																	
'32244																	✛						✛LVCH
'32245	✔																✛	✛					✛LVCH
'32316	✔																						
'32318	✔																						
'32501	✔																✛	✛					
'32543	✔																						
'32857																							✛SSTL
'32867																							✛SSTL
'32877																							✛SSTL
'33245																	✛						✛LVCH
'36800																							✛CBT
'40103																			✔	✔			
'40105																			✔	✔			
'161284																					✔	✔	See JTAG
'162240					✔																		
'162241					✔																		
'162244	✔		✔		✔											✔						✔	✔LVCR
'162245	✔		✛		✔																	✔	
'162260	✔															✔							
'162268																✔							
'162269																✔							✔ALVCHR
'162280																✔							
'162292																							✔CBT ✔CBTLV
'162334																✔							
'162344																✔							
'162373					✛																		
'162374					✔											✔							

✔ Product available in technology indicated   • Product available in reduced-noise advanced CMOS (11000 series)   ✛ New product planned in technology indicated
✷ Product available as a military device only   * Product planned as a military device

TEXAS INSTRUMENTS

DEVICE	BiCMOS					BIPOLAR						CMOS											OTHER
	ABT	ALB	ALVT	BCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	AVCH	HC	HCT	LV	LVC	
'162409																✔							
'162460	✔																						
'162500	✔																						
'162501	✔																						
'162525																✔							
'162541					✔																		
'162601	✔															✔							
'162721																✔							
'162820																✔							
'162822																							✔HSTL
'162823	✔																						
'162825	✔																						
'162827	✔		✔													✔							
'162830																							✔ALVCHS
'162831																✔							
'162832																✔							
'162834																✔							
'162835																✔							
'162836																✔							
'162841	✔												✔										
'164245																✔							
'182502	✔				✔																		See JTAG
'182504	✔				✔																		See JTAG
'182512					✔																		See JTAG
'182514					✛																		See JTAG
'182516					✛																		See JTAG
'182646	✔				✔																		See JTAG
'182652	✔				✔																		See JTAG
'34X245																							✛CBT

✔ Product available in technology indicated • Product available in reduced-noise advanced CMOS (11000 series) ✛ New product planned in technology indicated
✶ Product available as a military device only * Product planned as a military device

TEXAS INSTRUMENTS

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DEVICE SELECTION GUIDE

CONTENTS

Refer to the following for MIL column entries:

military package description and availability

CDIP (ceramic dual-in-line package) J = 14/16/20 pins JT = 24/28 pins	**CFP** (ceramic flatpack) WA = 14 pins (small outline) W = 14/16/20 pins WD = 48/56 pins	**CQFP** (ceramic quad flatpack) HV = 68 pins HT = 84 pins HS = 100 pins HFP = 132 pins
schedule ✔ = Now ✛ = Planned	**CPGA** (ceramic pin grid array) GB = 68/84/120 pins	**LCCC** (leadless ceramic chip carrier) FK = 20/28 pins

★ = Please see the corresponding device data sheet for correct military nomenclature
     or visit http://www.ti.com/sc/docs/military for TI military product information.

ABT
Advanced
BiCMOS Technology Logic

The ABT family is TI's second-generation family of BiCMOS bus-interface products. It is manufactured using a 0.8-μ BiCMOS process and provides high drive up to 64 mA and propagation delays in the 5-ns range, while maintaining very low power consumption. ABT products are well suited for live-insertion applications with an I_{off} specification of 0.1 mA.

To reduce transmission-line effects, the ABT family has series damping resistor options. Furthermore, there are special ABT parts that provide extremely high-current drive (180 mA) to transmit down to 25-Ω transmission lines. Advanced bus functions, such as universal bus transceivers (UBT™) emulate a wide variety of bus-interface functions. Multiplexing options for memory interleaving and bus upsizing or downsizing also are provided.

The ABT devices can be purchased in octal, Widebus™, or Widebus+™. The Widebus and Widebus+ packages feature higher performance with reduced noise and flow-through pinout for easier board layout. In addition, the Widebus+ devices have bus-hold circuitry on the inputs to eliminate the need for external pullup resistors for floating inputs.

See www.ti.com/sc/logic for the most current data sheets.

ABT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	TQFP	
SN74ABT125	14	Quad Bus Buffer Gate (OE)	✔	✔	✔	✔	✔			SCBS182E
SN74ABT126	14	Quad Bus Buffer Gate (OE)		✔	✔	✔	✔			SCBS183D
SN74ABT240A	20	Octal Buffer/Driver	★	✔	✔	✔	✔			SCBS098H
SN74ABT241A	20	Octal Buffer/Driver	★	✔	✔	✔	✔			SCBS184D
SN74ABT244A	20	Octal Buffer/Driver	★	✔	✔	✔	✔	✤		SCBS099I
SN74ABT245B	20	Octal Bus Transceiver	★	✔	✔	✔	✔	✔		SCBS081H
SN74ABTH245	20	Octal Bus Transceiver	✤	✔	✔	✔	✔	✔		SCBS663C
SN74ABT273	20	Octal D-Type Flip-Flop With Clear	✔	✔	✔	✔	✔			SCBS185B
SN74ABT373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔			SCBS155D
SN74ABT374A	20	Octal D-Type Flip-Flop	★	✔	✔	✔	✔			SCBS111G
SN74ABT377A	20	Octal D-Type Flip-Flop With Clock Enable	✔	✔	✔	✔	✔			SCBS156E
SN74ABT533A	20	Octal D-Type Transparent Latch	★	✔	✔	✔	✔			SCBS186D
SN74ABT534A	20	Octal D-Type Flip-Flop	★	✔	✔	✔	✔			SCBS187F
SN74ABT540	20	Octal Buffer/Driver		✔	✔	✔				SCBS188C
SN74ABT541B	20	Octal Buffer/Driver	★	✔	✔	✔	✔			SCBS093K
SN74ABT543A	24	Octal Registered Bus Transceiver	✔	✔	✔	✔	✔			SCBS157F
SN74ABT573A	20	Octal D-Type Transparent Latch	★	✔	✔	✔	✔			SCBS190C
SN74ABT574A	20	Octal D-Type Flip-Flop	★	✔	✔	✔	✔			SCBS191C
SN74ABT620	20	Octal Bus Transceiver		✔	✔	✔				SCBS113D
SN74ABT623	20	Octal Bus Transceiver	★	✔	✔	✔	✔			SCBS114D
SN74ABT640	20	Octal Bus Transceiver		✔	✔	✔	✔			SCBS104C
SN74ABT646A	24	Octal Registered Bus Transceiver	✔	✔	✔	✔	✔	✔		SCBS069G
SN74ABT651	24	Octal Registered Bus Transceiver		✔	✔	✔				SCBS083E
SN74ABT652A	24	Octal Registered Bus Transceiver	✔	✔	✔	✔				SCBS072F
SN74ABT657A	24	Octal Parity Bus Transceiver		✔	✔	✔				SCBS192E
SN74ABT821A	24	10-Bit Bus-Interface Flip-Flop	★	✔	✔	✔				SCBS193E
SN74ABT823	24	9-Bit Bus-Interface Flip-Flop	✔	✔	✔	✔				SCBS158E
SN74ABT827	24	10-Bit Buffer/Driver	✔	✔	✔	✔	✔			SCBS159D
SN74ABT833	24	8-Bit to 9-Bit Parity Bus Transceiver		✔	✔					SCBS195C
SN74ABT841A	24	10-Bit Bus-Interface D-Type Latch	★	✔	✔	✔	✔			SCBS196D

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now   ★ = See page 4–3.
✤ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	TQFP	
SN74ABT843	24	9-Bit Bus-Interface D-Type Latch	✔	✔	✔	✔				SCBS197D
SN74ABT853	24	8-Bit to-9 Bit Parity Bus Transceiver	✔	✔	✔	✔	✔			SCBS198F
SN74ABT861	24	10-Bit Bus Transceiver		✔	✔	✛				SCBS199C
SN74ABT863	24	9-Bit Bus Transceiver		✔	✔	✔				SCBS201E
SN74ABT2240A	20	Octal Buffer and Line/MOS Driver	✔	✔	✔	✔	✔			SCBS232E
SN74ABT2241	20	Octal Buffer and Line/MOS Driver		✔	✔	✔	✔			SCBS233B
SN74ABT2244A	20	Octal Buffer and Line/MOS Driver	★	✔	✔	✔	✔			SCBS106E
SN74ABT2245	20	Octal Transceiver and Line/MOS Driver	✔	✔	✔	✔	✔			SCBS234D
SN74ABTR2245	20	Octal Transceiver and Line/MOS Driver	✔	✔	✔	✔	✔	✔		SCBS680A
SN74ABT2827	24	10-Bit Buffer/Driver With Series Resistors		✔	✔					SCBS648A
SN74ABT2952A	24	Octal Registered Bus Transceiver		✔	✔	✔				SCBS203D
SN74ABT5400A	28	11-Bit Line/Memory Driver			✔					SCBS661B
SN74ABT5401	28	11-Bit Line/Memory Driver			✔					SCBS235B
SN74ABT5402A	28	12-Bit Line/Memory Driver			✔					SCBS660B
SN74ABT5403	28	12-Bit Line/Memory Driver			✔					SCBS236B
SN74ABT16240A	48	16-Bit Buffer/Driver	✔			✔	✔	✔		SCBS095G
SN74ABT16241A	48	16-Bit Buffer/Driver	✔			✔	✔	✔		SCBS096G
SN74ABT16244A	48	16-Bit Buffer/Driver	★			✔	✔	✔		SCBS073G
SN74ABTH16244	48	16-Bit Buffer/Driver				✔	✔	✛		SCBS677C
SN74ABT16245A	48	16-Bit Bus Transceiver	★			✔	✔	✔		SCBS300E
SN74ABTH16245	48	16-Bit Bus Transceiver				✔	✔	✔		SCBS662I
SN74ABTH16260	56	12-to-24 Multiplexed D-Type Latch With Power-Up 3-State and Bus Hold				✔	✔			SCBS204C
SN74ABT16373A	48	16-Bit D-Type Transparent Latch	✔			✔	✔			SCBS160C
SN74ABT16374A	48	16-Bit D-Type Flip-Flop	✔			✔	✔			SCBS205C
SN74ABTH16460	56	4-to-1 Multiplexed/Demultiplexed Transceiver				✔	✔			SCBS207F
SN74ABT16470	56	16-Bit Registered Bus Transceiver				✔	✔			SCBS085E
SN74ABT16500B	56	18-Bit Universal Bus Transceiver				✔	✔			SCBS057G
SN74ABT16501	56	18-Bit Universal Bus Transceiver				✔	✔			SCBS086C
SN74ABT16540A	48	16-Bit Buffer/Driver				✔	✔	✔		SCBS208C
SN74ABT16541A	48	16-Bit Buffer/Driver				✔	✔	✔		SCBS118C
SN74ABT16543	56	16-Bit Registered Bus Transceiver	✔			✔	✔			SCBS087C
SN74ABT16600	56	18-Bit Universal Bus Transceiver				✔	✔			SCBS209B
SN74ABT16601	56	18-Bit Universal Bus Transceiver	✔			✔	✔			SCBS210C
SN74ABT16623	48	16-Bit Bus Transceiver				✔	✔			SCBS211B
SN74ABT16640	48	16-Bit Bus Transceiver	✔			✔	✔			SCBS107C
SN74ABT16646	56	16-Bit Registered Bus Transceiver	✔			✔				SCBS212C
SN74ABT16652	56	16-Bit Registered Bus Transceiver	✔			✔				SCBS215B

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DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	TQFP	
SN74ABT16657	56	16-Bit Parity Bus Transceiver				✔	✔			SCBS103B
SN74ABT16821	56	20-Bit Bus-Interface Flip-Flop				✔	✔			SCBS216B
SN74ABT16823	56	18-Bit Bus-Interface Flip-Flop	✔			✔	✔			SCBS217C
SN74ABTH16823	56	18-Bit Bus-Interface Flip-Flop				✔	✔	✛		SCBS664B
SN74ABT16825	56	18-Bit Buffer/Driver				✔				SCBS218C
SN74ABT16827	56	20-Bit Buffer/Driver				✔	✔			SCBS220C
SN74ABT16833	56	Dual 8-Bit to 9-Bit Parity Bus Transceiver				✔	✔			SCBS097D
SN74ABT16841	56	20-Bit Bus-Interface D-Type Latch	✔			✔				SCBS222C
SN74ABT16843	56	18-Bit Bus-Interface D-Type Latch				✔	✔			SCBS223E
SN74ABT16853	56	Dual 8-Bit to 9-Bit Parity Bus Transceiver				✔				SCBS153B
SN74ABT16863	48	18-Bit Bus Transceiver				✔				SCBS225C
SN74ABT16952	56	16-Bit Registered Bus Transceiver				✔	✔			SCBS082C
SN74ABTH25245	24	25-Ω Octal Bus Transceiver		✔	✔					SCBS251F
SN74ABTH32245	100	36-Bit Bus Transceiver With Bus Hold							✔	SCBS228G
SN74ABTH32316	80	16-Bit Tri-Port Universal Bus Exchanger With Clock-Enable and Bus Hold							✔	SCBS179E
SN74ABTH32318	80	18-Bit Tri-Port Universal Bus Exchanger With Bus Hold							✔	SCBS180E
SN74ABTH32501	100	36-Bit Universal Bus Transceiver							✔	SCBS229F
SN74ABTH32543	100	36-Bit Registered Bus Transceiver							✔	SCBS230F
SN74ABT162244	48	16-Bit Buffer/Driver With Series Resistors	✔			✔	✔	✔		SCBS238D
SN74ABT162245	48	16-Bit Bus Transceiver With Series Resistors	✔			✔	✔			SCBS239E
SN74ABTH162245	48	16-Bit Bus Transceiver With Series Resistors and Bus Hold				✔	✔	✔		SCBS712A
SN74ABTH162260	56	12-to-24 Multiplexed D-Type Latch With Series Resistors				✔	✔			SCBS240D
SN74ABTH162460	56	4-to-1 Multiplexed/Demultiplexed Registered Transceiver With Series Resistors				✔	✔			SCBS241E
SN74ABT162500	56	18-Bit Universal Bus Transceiver With Series Resistors				✔				SCBS242E
SN74ABT162501	56	18-Bit Universal Bus Transceiver With Series Resistors				✔	✔			SCBS243E
SN74ABT162601	56	18-Bit Universal Bus Transceiver With Series Resistors	✔			✔	✔			SCBS247G
SN74ABT162823A	56	18-Bit Bus-Interface Flip-Flop With Series Resistors				✔				SCBS666A
SN74ABT162825	56	18-Bit Buffer/Driver With Series Resistors				✔				SCBS474C
SN74ABT162827A	56	20-Bit Buffer/Driver With Series Resistors				✔	✔			SCBS248E
SN74ABT162841	56	20-Bit Bus-Interface D-Type Latch With Series Resistors				✔	✔			SCBS665B

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ABTE/ETL
Advanced BiCMOS Technology/ Enhanced Transceiver Logic

ABTE has wider noise margins and is backward compatible with existing TTL logic. ABTE devices support the VME64-ETL specification with tight tolerances on skew and transition times. ABTE is manufactured using the latest 0.8-μ BiCMOS process by providing high drive up to 90 mA. Other features include a bias pin and internal pullup resistors on control pins for maximum live-insertion protection. Bus-hold circuitry eliminates external pullup resistors on the inputs and series damping resistors on the outputs to damp reflections.

See www.ti.com/sc/logic for the most current data sheets.

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	SSOP	TSSOP	
SN74ABTE16245	48	16-Bit Incident-Wave Switching ETL Bus Transceiver	✔	✔	✔	SCBS226F
SN74ABTE16246	48	11-Bit Incident-Wave Switching ETL Bus-Control Transceiver With 3-State and Open-Collector Outputs		✔	✔	SCBS227E

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule
✔ = Now
✙ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

![Texas Instruments logo] **TEXAS INSTRUMENTS**

AC/ACT
Advanced CMOS Logic

TI offers a full family of advanced CMOS logic with a wide range of AC/ACT devices for low-power, medium- to high-speed applications. The recent addition of products acquired from Harris Semiconductor has added many additional functions. Over 180 AC and ACT device types are available, including gates, latches, flip-flops, buffers/drivers, counters, multiplexers, transceivers, and registered transceivers. The AC/ACT family is a reliable, low-power logic family with 24-mA output current drive.

Included in the family are standard end-pin products and center-pin V_{CC} and ground-configuration products with output-edge control (OEC™) circuitry. The OEC circuitry, available only with the center-pin products, helps reduce simultaneous switching noise associated with high-speed logic. Included in the center-pin products are 16-, 18-, and 20-bit bus-interface functions packaged in 48- and 56-pin shrink small-outline packages (SSOP) and thin shrink small-outline package (TSSOP). These packages allow the designer to double functionality in the same circuit board area or reduce the circuit board area by one-half.

AC devices offer CMOS-compatible inputs, and ACT devices offer TTL-compatible inputs.

See www.ti.com/sc/logic for the most current data sheets.

AC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOP	SSOP	TSSOP	
CD74AC00	14	Quad 2-Input NAND Gate	✔	✔	✔				SCHS223
SN74AC00	14	Quad 2-Input NAND Gate	✔	✔	✔		✔	✔	SCAS524C
CD74AC02	14	Quad 2-Input NOR Gate	✔	✔	✔				SCHS224
CD74AC04	14	Hex Inverter	✔	✔	✔				SCHS225
SN74AC04	14	Hex Inverter	✔	✔	✔		✔	✔	SCAS519C
CD74AC05	14	Hex Inverter/Buffer With Open-Drain Outputs	✔	✔	✔				SCHS225
CD74AC08	14	Quad 2-Input AND Gate	✔	✔	✔				SCHS226
SN74AC08	14	Quad 2-Input AND Gate	✔	✔	✔		✔	✔	SCAS536B
CD74AC10	14	Triple 3-Input NAND Gate	✔	✔	✔				SCHS227
SN74AC10	14	Triple 3-Input NAND Gate	✔	✔	✔		✔	✔	SCAS529B
SN74AC11	14	Triple 3-Input AND Gate	✔	✔	✔		✔	✔	SCAS532B
CD74AC14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔				SCHS228
SN74AC14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔		✔	✔	SCAS522D
CD74AC20	14	Dual 4-Input NAND Gate		✔	✔				SCHS229
CD74AC32	14	Quad 2-Input OR Gate	✔	✔	✔				SCHS230
SN74AC32	14	Quad 2-Input OR Gate	✔	✔	✔		✔	✔	SCAS528B
CD74AC74	14	Dual D-Type Flip-Flop	✔	✔	✔				SCHS231
SN74AC74	14	Dual D-Type Flip-Flop	✔	✔	✔		✔	✔	SCAS521C
CD74AC86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔				SCHS232
SN74AC86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔		✔	✔	SCAS533A
CD74AC109	16	Dual J-K Flip-Flop With Set and Reset	✔	✔	✔				SCHS282
CD74AC112	16	Dual J-K Flip-Flop With Set and Reset	✔	✔	✔				SCHS233
CD74AC138	16	Inverting 3-to-8 Line Decoder/Demultiplexer	✔	✔	✔				SCHS234
CD74AC139	16	Dual 2-to-4 Line Decoder/Demultiplexer	✔	✔	✔				SCHS235
CD74AC151	16	8-Input Multiplexer		✔	✔				SCHS236
CD74AC153	16	Dual 4-Input Multiplexer	✔	✔	✔				SCHS237
CD74AC157	16	Quad 2-Input Multiplexer	✔	✔	✔				SCHS283
CD74AC158	16	Inverting Quad 2-Input Multiplexer			✔				SCHS283
CD74AC161	16	Synchronous 4-Bit Binary Counter With Asynchronous Reset	✔	✔	✔				SCHS284

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

See Appendix A for package information on CD54/74AC devices.

schedule
✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOP	SSOP	TSSOP	
CD74AC163	16	Synchronous 4-Bit Binary Counter With Synchronous Reset	✔	✔	✔				SCHS284
CD74AC164	14	8-Bit Serial-In/Parallel-Out Shift Register	✔	✔	✔				SCHS240
CD74AC174	16	Hex D-Type Flip-Flop With Reset		✔	✔				SCHS241
CD74AC175	16	Quad D-Type Flip-Flop With Reset			✔				SCHS242
CD74AC238	16	3-to-8 Line Decoder/Demultiplexer			✔				SCHS234
CD74AC240	20	Inverting Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔				SCHS287
SN74AC240	20	Inverting Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔		✔	✔	SCAS512C
SN74AC241	20	Octal Buffer/Line Driver With 3-State Outputs		✔	✔		✔	✔	SCAS513C
CD74AC244	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔	✔	✔		SCHS244
SN74AC244	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔	✔	✔	✔	SCAS514C
CD74AC245	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔		✔		SCHS245
SN74AC245	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔		✔	✔	SCAS461D
CD74AC251	16	8-Input Multiplexer With 3-State Outputs			✔				SCHS246
CD74AC253	16	Dual 4-Input Multiplexer With 3-State Outputs			✔				SCHS247
CD74AC257	16	Quad 2-Input Multiplexer With 3-State Outputs	✔	✔	✔		✔		SCHS248
CD74AC273	20	Octal D-Type Flip-Flop With Reset	✔	✔	✔		✔		SCHS249
CD74AC280	14	8-Bit Odd/Even Parity Generator/Checker	✔	✔	✔				SCHS250
CD74AC283	16	4-Bit Full Adder With Fast Carry	✔	✔	✔				SCHS251B
CD74AC299	20	8-Bit Universal Shift Register With 3-State Outputs	✔		✔				SCHS288
CD74AC323	20	8-Bit Universal Shift Register With 3-State Outputs and Synchronous Reset			✔				SCHS288
CD74AC373	20	Octal Transparent Latch With 3-State Outputs	✔	✔	✔				SCHS289
SN74AC373	20	Octal D-Type Transparent Latch 3-State Outputs	✔	✔	✔	✔	✔	✔	SCAS540B
CD74AC374	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔				SCHS290
SN74AC374	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔		✔	✔	SCAS543B
SN74AC533	20	Octal D-Type Transparent Latch		✔	✔		✔	✔	SCAS555A
CD74AC534	20	Inverting Octal D-Type Flip-Flop			✔				SCHS290
SN74AC534	20	Inverting Octal D-Type Flip-Flop		✔	✔		✔	✔	SCAS554A
CD74AC540	20	Inverting Octal Buffer/Line Driver With 3-State Outputs			✔				SCHS285
CD74AC541	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔		✔		SCHS285
CD74AC563	20	Octal D-Type Transparent Latch With 3-State Outputs			✔				SCHS291
SN74AC563	20	Octal D-Type Transparent Latch With 3-State Outputs		✔	✔		✔	✔	SCAS552A
SN74AC564	20	Octal D-Type Flip-Flop		✔	✔		✔	✔	SCAS551A
CD74AC573	20	Octal D-Type Transparent Latch With 3-State Outputs	✔	✔	✔				SCHS291
SN74AC573	20	Octal D-Type Transparent Latch With 3-State Outputs		✔	✔		✔	✔	SCAS542B
CD74AC574	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔				SCHS292
SN74AC574	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔		✔	✔	SCAS541B
CD74AC623	20	Octal Bus-Transceiver With 3-State Outputs			✔				SCHS286

TEXAS INSTRUMENTS

AC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOP	SSOP	TSSOP	
CD74AC646	24	Octal Bus-Transceiver/Register With 3-State Outputs			✔				SCHS293
CD74AC652	24	Octal Bus-Transceiver/Register With 3-State Outputs			✔				SCHS294
74AC11000	16	Quad 2-Input Positive-NAND Gate		✔	✔				SCLS054A
74AC11004	20	Hex Inverter		✔	✔		✔		SCAS033B
74AC11008	16	Quad 2-Input Positive-AND Gate		✔	✔			✔	SCAS014C
74AC11032	14/16	Quad 2-Input Positive-OR Gate		✔	✔		✔		SCAS007C
74AC11074	14	Dual D-Type Flip-Flop		✔	✔			✔	SCAS499A
74AC11086	16	Quad 2-Input Exclusive-OR Gate		✔	✔				SCAS081A
74AC11138	16	3-to-8 Decoder/Demultiplexer		✔	✔			✔	SCAS042B
74AC11139	16	Dual 2-to-4 Decoder/Demultiplexer		✔	✔			✔	SCAS070B
74AC11240	24	Octal Buffer/Driver		✔	✔		✔		SCAS448A
74AC11244	24	Octal Buffer/Driver		✔	✔		✔	✔	SCAS171B
74AC11245	24	Octal Bus Transceiver		✔	✔		✔	✔	SCAS010B
74AC11257	20	Quad 2-to-1 Data Selector/Multiplexer					✔	✔	SCAS049B
74AC11373	24	Octal D-Type Transparent Latch		✔	✔		✔		SCAS213A
74AC11374	24	Octal D-Type Flip-Flop		✔	✔		✔		SCAS214A
74AC11652	28	Octal Registered Bus Transceiver		✔	✔				SCAS088A
74AC16244	48	16-Bit Buffer/Driver					✔	✔	SCAS120A
74AC16245	48	16-Bit Bus Transceiver					✔	✔	SCAS235A
74AC16373	48	16-Bit D-Type Transparent Latch					✔		SCAS121B
74AC16374	48	16-Bit D-Type Flip-Flop					✔		SCAS123B
74AC16620	48	16-Bit Bus Transceiver					✔		SCAS239A
74AC16652	56	16-Bit Registered Bus Transceiver					✔		SCAS242A

TEXAS
INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74ACT00	14	Quad 2-Input NAND Gate	✔	✔	✔			SCHS223
SN74ACT00	14	Quad 2-Input NAND Gate	✔	✔	✔	✔	✔	SCAS523A
CD74ACT02	14	Quad 2-Input NOR Gate	✔	✔	✔			SCHS224
CD74ACT04	14	Hex Inverter	✔	✔	✔			SCHS225
SN74ACT04	14	Hex Inverter	✔	✔	✔	✔	✔	SCAS518A
CD74ACT05	14	Hex Inverter/Buffer With Open-Drain Outputs	✔	✔	✔			SCHS225
CD74ACT08	14	Quad 2-Input AND Gate	✔	✔	✔			SCHS226
SN74ACT08	14	Quad 2-Input AND Gate	✔	✔	✔	✔	✔	SCAS535A
CD74ACT10	14	Triple 3-Input NAND Gate	✔	✔	✔			SCHS227
SN74ACT10	14	Triple 3-Input NAND Gate	✔	✔	✔	✔	✔	SCAS526A
SN74ACT11	14	Triple 3-Input AND Gate	✔	✔	✔	✔	✔	SCAS531A
CD74ACT14	14	Hex Inverter With Schmitt-Trigger Inputs	✔	✔	✔			SCHS228
SN74ACT14	14	Hex Inverter With Schmitt-Trigger Inputs	✔	✔	✔	✔	✔	SCAS557D
CD74ACT20	14	Dual 4-Input NAND Gate	✔	✔	✔			SCHS229
CD74ACT32	14	Quad 2-Input OR Gate	✔	✔	✔			SCHS230
SN74ACT32	14	Quad 2-Input OR Gate	✔	✔	✔	✔	✔	SCAS530A
CD74ACT74	14	Dual D-Type Flip-Flop	✔	✔	✔			SCHS231
SN74ACT74	14	Dual D-Type Flip-Flop	✔	✔	✔	✔	✔	SCAS520D
CD74ACT86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔			SCHS232
SN74ACT86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔	✔	✔	SCAS534A
CD74ACT109	16	Dual J-K Flip-Flop With Set and Reset	✔	✔	✔			SCHS233
CD74ACT112	16	Dual J-K Flip-Flop With Set and Reset	✔		✔			SCHS233
CD74ACT138	16	Inverting 3-to-8 Line Decoder/Demultiplexer	✔	✔	✔			SCHS234
CD74ACT139	16	3-to-8 Line Decoder/Demultiplexer	✔	✔	✔			SCHS235
CD74ACT151	16	8-Input Multiplexer	✔		✔			SCHS236
CD74ACT153	16	Dual 4-Input Multiplexer	✔	✔	✔			SCHS237
CD74ACT157	16	Quad 2-Input Multiplexer		✔	✔			SCHS238
CD74ACT158	16	Inverting Quad 2-Input Multiplexer			✔			SCHS238
CD74ACT161	16	Synchronous 4-Bit Binary Counter With Asynchronous Reset	✔	✔	✔			SCHS284
CD74ACT163	16	Synchronous 4-Bit Binary Counter With Synchronous Reset	✔	✔	✔			SCHS284

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

See Appendix A for package information on CD54/74ACT devices.

schedule
✔ = Now
✛ = Planned

TEXAS INSTRUMENTS

DEVICE SELECTION GUIDE

ACT

DEVICE	NO. PINS	FUNCTION	MIL	PDIP	SOIC	SSOP	TSSOP	LITERATURE REFERENCE
CD74ACT164	14	8-Bit Serial-In/Parallel-Out Shift Register	✔	✔	✔			SCHS240
CD74ACT174	16	Hex D-Type Flip-Flop With Reset	✔	✔	✔			SCHS241
CD74ACT175	16	Quad D-Type Flip-Flop With Reset		✔	✔			SCHS242
CD74ACT238	16	Synchronous 4-Bit Binary Up/Down Counter		✔				SCHS234
CD74ACT240	20	Octal Buffer/Driver	✔	✔	✔			SCHS244
SN74ACT240	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	SCAS515B
CD74ACT241	20	Octal Buffer/Driver	✔	✔	✔			SCHS287
SN74ACT241	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	SCAS516B
CD74ACT244	20	Octal Buffer/Driver	✔	✔	✔	✔		SCHS287
SN74ACT244	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	SCAS517B
CD74ACT245	20	Octal Bus Transceiver	✔	✔	✔	✔		SCHS245
SN74ACT245	20	Octal Bus Transceiver	✔	✔	✔	✔	✔	SCAS452C
CD74ACT253	16	Dual 4-Input Multiplexer With 3-State Outputs	✔	✔	✔			SCHS247
CD74ACT257	16	Quad 2-Input Multiplexer With 3-State Outputs	✔	✔	✔	✔		SCHS248
CD74ACT258	16	Quad 2-Input Multiplexer With 3-State Outputs			✔			SCHS248
CD74ACT273	20	Octal D-Type Flip-Flop With Reset	✔	✔	✔	✔		SCHS249
CD74ACT280	14	8-Bit Odd/Even Parity Generator/Checker	✔	✔	✔			SCHS250
CD74ACT283	16	4-Bit Full Adder With Fast Carry	✔	✔	✔			SCHS251
CD74ACT297	16	Digital Phase-Locked Loop			✔			SCHS297A
CD74ACT299	20	8-Bit Universal Shift Register With 3-State Outputs	✔		✔			SCHS288
CD74ACT373	20	Octal D-Type Transparent Latch	✔	✔	✔			SCHS289
SN74ACT373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	SCAS544C
CD74ACT374	20	Octal D-Type Flip-Flop	✔	✔	✔			SCHS290
SN74ACT374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	SCAS539D
SN74ACT533	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	SCAS553A
SN74ACT534	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	SCAS556A
CD74ACT540	20	Inverting Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS285
CD74ACT541	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔	✔		SCHS285
SN74ACT563	20	Octal D-Type Transparent Latch		✔	✔	✔	✔	SCAS550A
SN74ACT564	20	Octal D-Type Flip-Flop		✔	✔	✔	✔	SCAS549A
CD74ACT573	20	Octal D-Type Transparent Latch	✔	✔	✔			SCHS291
SN74ACT573	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	SCAS538B
CD74ACT574	20	Octal D-Type Flip-Flop	✔	✔	✔			SCHS292
SN74ACT574	20	Octal D-Type Flip-Flop		✔	✔	✔	✔	SCAS537B
CD74ACT623	20	Octal Bus Transceiver With 3-State Outputs	✔		✔			SCHS286
CD74ACT646	24	Octal Bus Transceiver/Register With 3-State Outputs		✔	✔			SCHS286
CD74ACT651	24	Inverting Octal Bus Transceiver/Register With 3-State Outputs			✔			SCHS294
CD74ACT652	24	Octal Bus Transceiver/Register With 3-State Outputs		✔	✔			SCHS294

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74ACT1284	20	7-Bit IEEE P1284 Driver/Receiver			✔	✔		SCAS459B
74ACT11004	20	Hex Inverter		✔	✔	✔	✔	SCAS215B
74ACT11008	16	Quad 2-Input Positive-AND Gate		✔	✔		✔	SCAS013C
74ACT11032	14, 16	Quad 2-Input Positive-OR Gate		✔	✔	✔	✔	SCAS008C
74ACT11074	14	Dual D-Type Flip-Flop		✔	✔	✔		SCAS498A
74ACT11139	16	Dual 2-to-4 Decoder/Demultiplexer		✔	✔		✔	SCAS175A
74ACT11240	24	Octal Buffer/Driver		✔	✔	✔		SCAS210A
74ACT11244	24	Octal Buffer/Driver		✔	✔	✔	✔	SCAS006C
74ACT11245	24	Octal Bus Transceiver		✔	✔	✔	✔	SCAS031C
74ACT11257	20	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	✔		SCAS053B
74ACT11286	14	9-Bit Parity Generator/Checker		✔	✔			SCAS069B
74ACT11373	24	Octal D-Type Transparent Latch		✔	✔	✔		SCAS015B
74ACT11374	24	Octal D-Type Flip-Flop		✔	✔	✔		SCAS217A
74ACT11543	28	Octal Registered Bus Transceiver			✔			SCAS136
74ACT11652	28	Octal Registered Bus Transceiver			✔			SCAS087A
74ACT11656	28	Octal Parity Bus Transceiver			✔			SCAS460A
74ACT16240	48	16-Bit Buffer/Driver	✔			✔		SCAS137C
74ACT16244	48	16-Bit Buffer/Driver	✔			✔	✔	SCAS116B
74ACT16245	48	16-Bit Bus Transceiver	✔			✔	✔	SCAS097B
74ACT16254	64	32-to-16 VL Bus Multiplexer/Demultiplexer					✔	SCAS527A
74ACT16373	48	16-Bit D-Type Transparent Latch	✔			✔		SCAS122C
74ACT16374	48	16-Bit D-Type Flip-Flop	✔			✔		SCAS124B
74ACT16540	48	16-Bit Buffer/Driver				✔		SCAS186A
74ACT16541	48	16-Bit Buffer/Driver				✔		SCAS208A
74ACT16543	56	16-Bit Registered Bus Transceiver				✔	✔	SCAS126B
74ACT16623	48	16-Bit Bus Transceiver				✔		SCAS152A
74ACT16646	56	16-Bit Registered Bus Transceiver				✔		SCAS127B
74ACT16651	56	16-Bit Registered Bus Transceiver				✔		SCAS449A
74ACT16652	56	16-Bit Registered Bus Transceiver				✔		SCAS128C
74ACT16657	56	Dual 8-to-9 Bit Parity Bus Transceiver				✔		SCAS164A
74ACT16823	56	18-Bit Bus-Interface Flip-Flop				✔		SCAS160A
74ACT16825	56	18-Bit Buffer/Driver				✔		SCAS155B
74ACT16827	56	20-Bit Buffer/Driver				✔		SCAS163A
74ACT16841	56	20-Bit Bus-Interface D-Type Latch				✔	✔	SCAS174A
74ACT16861	56	20-Bit Bus Transceiver				✔		SCAS197B
74ACT16863	56	18-Bit Bus Transceiver				✔		SCAS162B
74ACT16952	56	16-Bit Registered Bus Transceiver				✔		SCAS159C
74ACT162841	56	20-Bit Bus-Interface D-Type Latch With 3-State Series Resistors				✔		Call

TEXAS INSTRUMENTS

AHC/AHCT
Advanced High-Speed
CMOS Logic

The AHC/AHCT logic family provides a natural migration path for HCMOS users who need more speed in low-power, low-noise, and low-drive applications. The AHC logic family consists of basic gates, octal, and 16-bit Widebus functions fabricated using the EPIC1-S process that produces high performance at low cost. TI also offers single-gate solutions, designated with 1G in the device name.

Performance characteristics of the AHC family are:

- Speed – Typical propagation delays of 5.2 ns (octals), about three times faster than HC devices. AHC devices are the quick and quiet solution for higher-speed operation.
- Low noise – The AHC family allows designers to combine the low-noise characteristics of HCMOS devices with today's performance levels without the overshoot and undershoot problems typical of higher-drive devices required to get AHC speeds.
- Low power – The AHC family CMOS technology exhibits low power consumption (40-μA maximum static current, one-half that of HCMOS).
- Drive – Output-drive current is $\pm$8 mA at 5 V and $\pm$4 mA at 3.3 V.
- Packaging – AHC devices are available in SOIC, SSOP, PDIP, TSSOP, TVSOP, and 5-pin SOT packages. Selected AHC devices are available in military versions (SN54AHCXX).

Using TI products offers several business advantages:

- Competitive advantage – AHC and competitors' VHC devices have equivalent specifications; therefore, AHC devices are drop-in replacements. With TI's production capacity, delivery performance, and competitive prices, AHC devices are among the most economical, easy-to-use, and easy-to-get logic products.
- Alternate source – TI has arrangements for one or more alternate sources for AHC/AHCT devices.

See www.ti.com/sc/logic for the most current data sheets.

AHC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	SOT	
SN74AHC1G00	5	Single 2-Input Positive-NAND Gate							✔	SCLS313E
SN74AHC1G02	5	Single 2-Input Positive-NOR Gate							✔	SCLS342D
SN74AHC1G04	5	Single Inverter Gate							✔	SCLS318G
SN74AHC1GU04	5	Unbuffered Single Inverter Gate							✔	SCLS343H
SN74AHC1G08	5	Single 2-Input Positive-AND Gate							✔	SCLS314E
SN74AHC1G14	5	Single Schmitt-Trigger Inverter Gate							✔	SCLS321F
SN74AHC1G32	5	Single 2-Input Positive-OR Gate							✔	SCLS317F
SN74AHC1G86	5	Single 2-Input Exclusive-OR Gate							✔	SCLS323E
SN74AHC1G125	5	Single Bus Buffer Gate With 3-State Outputs							✔	SCLS377C
SN74AHC1G126	5	Single Bus Buffer Gate With 3-State Outputs							✔	SCLS379B
SN74AHC00	14	Quad 2-Input NAND Gate	✔	✔	✔	✔	✔	✔		SCLS227D
SN74AHC02	14	Quad 2-Input NOR Gate	✔	✔	✔	✔	✔	✔		SCLS254F
SN74AHC04	14	Hex Inverter	✔	✔	✔	✔	✔	✔		SCLS231H
SN74AHCU04	14	Unbuffered Hex Inverter	✔	✔	✔	✔	✔	✔		SCLS234F
SN74AHC05	14	Hex Inverter	✛	✔	✔	✔	✔	✔		SCLS357D
SN74AHC08	14	Quad 2-Input AND Gate	✔	✔	✔	✔	✔	✔		SCLS236C
SN74AHC14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔	✔	✔		SCLS238D
SN74AHC32	14	Quad 2-Input OR Gate	✔	✔	✔	✔	✔	✔		SCLS247C
SN74AHC74	14	Dual D-Type Flip-Flop With Preset and Clear	✔	✔	✔	✔	✔	✔		SCLS255E
SN74AHC86	14	Quad Exclusive-OR Gate	✔	✔	✔	✔	✔	✔		SCLS249D
SN74AHC123A	16	Dual Monostable Vibrator	✛	✛	✛	✛	✛	✛		SCLS352B
SN74AHC125	14	Quad Bus Buffer Gate ($\overline{OE}$)	✔	✔	✔	✔	✔	✔		SCLS256E
SN74AHC126	14	Quad Bus Buffer Gate (OE)	✔	✔	✔	✔	✔	✔		SCLS257H
SN74AHC132	14	Quad NAND Gate With Schmitt-Trigger Inputs	✛	✔	✔	✔	✔	✔		SCLS365C
SN74AHC138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔	✔	✔	✔		SCLS258G
SN74AHC139	16	Dual 2-to-4 Line Decoder/Demultiplexer		✔	✔	✔	✔	✔		SCLS259F
SN74AHC157	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔	✔	✔	✔		SCLS345D

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	SOT	
SN74AHC158	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	✔	✔	✔		SCLS346C
SN74AHC174	16	Hex D-Type Flip-Flop With Clear	✛	✔	✔	✔	✔	✔		SCLS425B
SN74AHC240	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS251D
SN74AHC244	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS226F
SN74AHC245	20	Octal Bus Transceiver	✔	✔	✔	✔	✔	✔		SCLS230E
SN74AHC257	20	Quad 2-to-1 Data Selector/Multiplexer		✛	✛	✛	✛			SCLS349C
SN74AHC258	20	Quad 2-to-1 Data Selector/Multiplexer		✛	✛	✛	✛			SCLS350C
SN74AHC273	20	Octal D-Type Flip-Flop With Clear	✔	✔	✔	✔	✔	✔		SCLS376C
SN74AHC367	16	Hex Buffer and Line Driver With 3-State Outputs	✛	✔	✔	✔	✔	✔		SCLS424A
SN74AHC373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	✔		SCLS235E
SN74AHC374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	✔		SCLS240E
SN74AHC540	20	Inverting Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS260F
SN74AHC541	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS261I
SN74AHC573	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	✔		SCLS242G
SN74AHC574	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	✔		SCLS244E
SN74AHC594	16	8-Bit Shift Register With Output Registers	✔	✔	✔	✔	✔	✔		SCLS423
SN74AHC595	16	8-Bit Shift Register With 3-State Output Registers		✔	✔	✔	✔	✛		SCLS373C
SN74AHC4040	16	12-Bit Asynchronous Binary Counter	✛	✛	✛	✛	✛	✛		SCLS422
SN74AHC4051	16	Analog Multiplexer/Demultiplexer	✛	✛	✛	✛	✛	✛		SCLS415
SN74AHC4053	16	Analog Multiplexer/Demultiplexer	✛	✛	✛	✛	✛	✛		SCLS416B
SN74AHC4066	14	Quad Bilateral Analog Switch		✛	✛	✛	✛	✛		SCLS421
SN74AHC16240	48	16-Bit Buffer/Driver	✛			✔	✔	✔		SCLS326E
SN74AHC16244	48	16-Bit Buffer/Driver	✛			✔	✔	✔		SCLS327E
SN74AHC16245	48	16-Bit Bus Transceiver	✛			✛	✛	✛		SCLS328C
SN74AHC16373	48	16-Bit D-Type Transparent Latch	✛			✔	✔	✔		SCLS329E
SN74AHC16374	48	16-Bit D-Type Flip-Flop	✛			✔	✔	✔		SCLS330E
SN74AHC16540	48	16-Bit Inverting Buffer/Driver	✛			✔	✔	✔		SCLS331D
SN74AHC16541	48	16-Bit Buffer/Driver	✛			✔	✔	✔		SCLS332D

TEXAS INSTRUMENTS

AHCT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	SOT	
SN74AHCT1G00	5	Single 2-Input Positive-NAND Gate							✔	SCLS316G
SN74AHCT1G02	5	Single 2-Input Positive-NOR Gate							✔	SCLS341F
SN74AHCT1G04	5	Single Inverter Gate							✔	SCLS319H
SN74AHCT1G08	5	Single 2-Input Positive-AND Gate							✔	SCLS315G
SN74AHCT1G14	5	Single Schmitt-Trigger Inverter Gate							✔	SCLS322I
SN74AHCT1G32	5	Single 2-Input Positive-OR Gate							✔	SCLS320G
SN74AHCT1G86	5	Single 2-Input Exclusive-OR Gate							✔	SCLS324G
SN74AHCT1G125	5	Single Bus Buffer Gate With 3-State Outputs							✔	SCLS378D
SN74AHCT1G126	5	Single Bus Buffer Gate With 3-State Outputs							✔	SCLS380D
SN74AHCT00	14	Quad 2-Input NAND Gate	✔	✔	✔	✔	✔	✔		SCLS229F
SN74AHCT02	14	Quad 2-Input NOR Gate	✔	✔	✔	✔	✔	✔		SCLS262G
SN74AHCT04	14	Hex Inverter	✔	✔	✔	✔	✔	✔		SCLS232I
SN74AHCT08	14	Quad 2-Input AND Gate	✔	✔	✔	✔	✔	✔		SCLS237G
SN74AHCT14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔	✔	✔		SCLS246K
SN74AHCT32	14	Quad 2-Input OR Gate	✔	✔	✔	✔	✔	✔		SCLS248G
SN74AHCT74	14	Dual D-Type Flip-Flop With Preset and Clear	✔	✔	✔	✔	✔	✔		SCLS263I
SN74AHCT86	14	Quad Exclusive-OR Gate	✔	✔	✔	✔	✔	✔		SCLS250H
SN74AHCT123A	16	Dual Retriggerable Monostable Vibrator	✛	✛	✛	✛	✛	✛		SCLS420A
SN74AHCT125	14	Quad Bus Buffer Gate ($\overline{OE}$)	✔	✔	✔	✔	✔	✔		SCLS264J
SN74AHCT126	14	Quad Bus Buffer Gate (OE)	✔	✔	✔	✔	✔	✔		SCLS265K
SN74AHCT132	14	Quad NAND Gate With Schmitt-Trigger Inputs	✛	✔	✔	✔	✔	✔		SCLS366D
SN74AHCT138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔	✔	✔	✔		SCLS266H
SN74AHCT139	16	Dual 2-to-4 Line Decoder/Demultiplexer		✔	✔	✔	✔	✔		SCLS267I
SN74AHCT157	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	✔	✔	✔		SCLS347G
SN74AHCT158	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	✔	✔	✔		SCLS348F
SN74AHCT174	16	Hex D-Type Flip-Flop With Clear	✛	✔	✔	✔	✔	✔		SCLS419C
SN74AHCT240	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS252G

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB   = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL   = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	SOT	
SN74AHCT244	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS228H
SN74AHCT245	20	Octal Bus Transceiver	✔	✔	✔	✔	✔	✔		SCLS233G
SN74AHCT257	20	Quad 2-to-1 Data Selector/Multiplexer		✛	✛	✛	✛			SCLS351E
SN74AHCT258	20	Quad 2-to-1 Data Selector/Multiplexer		✛	✛	✛	✛			SCLS344E
SN74AHCT273	20	Octal D-Type Flip-Flop With Clear	✛	✔	✔	✔	✔	✔		SCLS375B
SN74AHCT367	16	Hex Buffer and Line Driver With 3-State Outputs	✛	✔	✔	✔	✔	✔		SCLS418B
SN74AHCT373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	✔		SCLS239I
SN74AHCT374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	✔		SCLS241H
SN74AHCT540	20	Inverting Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS268H
SN74AHCT541	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	✔		SCLS269K
SN74AHCT573	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	✔		SCLS243J
SN74AHCT574	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	✔		SCLS245H
SN74AHCT594	16	8-Bit Shift Register With Output Registers	✛	✔	✔	✔	✔	✔		SCLS417
SN74AHCT595	16	8-Bit Shift Register With 3-State Output Registers	✛	✔	✔	✔	✔	✔		SCLS374C
SN74AHCT16240	48	16-Bit Buffer/Driver	✛			✔	✔	✔		SCLS333G
SN74AHCT16244	48	16-Bit Buffer/Driver	✛			✔	✔	✔		SCLS334G
SN74AHCT16245	48	16-Bit Bus Transceiver	✛			✔	✔	✔		SCLS335G
SN74AHCT16373	48	16-Bit D-Type Transparent Latch	✛			✔	✔	✔		SCLS336F
SN74AHCT16374	48	16-Bit D-Type Flip-Flop	✛			✔	✔	✔		SCLS337F
SN74AHCT16540	48	16-Bit Inverting Buffer/Driver	✛			✔	✔	✔		SCLS338F
SN74AHCT16541	48	16-Bit Buffer/Driver	✛			✔	✔	✔		SCLS339F

TEXAS INSTRUMENTS

ALB
Advanced Low-Voltage
BiCMOS Logic

The specially designed 3.3-V ALB family uses the latest 0.6-μ BiCMOS process technology for bus-interface functions. In addition, ALB provides 25-mA drive at 3.3 V with maximum propagation delays of 2.2 ns, making it one of TI's fastest logic families. The inputs have clamping diodes to eliminate overshoot and undershoot.

The ALB family is currently available in a limited number of functions with Widebus™ and Shrink Widebus™ footprints with advanced packaging options such as shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP).

See www.ti.com/sc/logic for the most current data sheets.

ALB

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			SSOP	TSSOP	TVSOP	
SN74ALB16244	48	16-Bit Buffer/Driver	✔	✔	✔	SCBS647C
SN74ALB16245	48	16-Bit Bus Transceiver	✔	✔	✔	SCBS678B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✢ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB   = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL   = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military
package description and availability.

![Texas Instruments logo]

ALS
Advanced Low-Power
Schottky Logic

The ALS family provides a full spectrum of over 130 bipolar logic functions.

This family, combined with the AS family, can be used to optimize systems through performance budgeting. By using AS in speed-critical paths and ALS where speed is less critical, designers can optimize speed and power performance in bipolar designs.

The ALS family includes gates, flip-flops, counters, drivers, transceivers, registered transceivers, readback latches, clock drivers, register files, and multiplexers.

See www.ti.com/sc/logic for the most current data sheets.

ALS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY MIL	PDIP	SOIC	SSOP	LITERATURE REFERENCE
SN74ALS00A	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔		SDAS187A
SN74ALS02A	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔		SDAS111B
SN74ALS03B	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔		SDAS013B
SN74ALS04B	14	Hex Inverter	✔	✔	✔	✔	SDAS063B
SN74ALS05A	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	✔	SDAS190A
SN74ALS08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔		SDAS191A
SN74ALS09	14	Quad 2-Input Positive-AND Gate With Open-Collector Outputs	✔	✔	✔		SDAS084B
SN74ALS10A	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔		SDAS002B
SN74ALS11A	14	Triple 3-Input Positive-AND Gate	✔	✔	✔		SDAS009C
SN74ALS20A	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔		SDAS192B
SN74ALS21A	14	Dual 4-Input Positive-AND Gate	✔	✔	✔		SDAS085B
SN74ALS27A	14	Triple 3-Input Positive-NOR Gate	✔	✔	✔		SDAS112B
SN74ALS30A	14	8-Input Positive-NAND Gate	✔	✔	✔		SDAS010B
SN74ALS32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔		SDAS113B
SN74ALS33A	14	Quad 2-Input NOR Buffer		✔	✔		SDAS034B
SN74ALS35A	14	Hex Noninverter With Open-Collector Outputs		✔	✔		SDAS011C
SN74ALS37A	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔		SDAS195A
SN74ALS38B	14	Quad 2-Input Postive-NAND Gate With Open-Collector Outputs	✔	✔	✔		SDAS196B
SN74ALS74A	14	Dual D-Type Flip-Flop With Clear and Preset	✔	✔	✔		SDAS143C
SN74ALS86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔		SDAS006B
SN74ALS109A	16	Dual J-$\overline{\text{K}}$ Positive-Edge-Triggered Flip-Flop	✔	✔	✔		SDAS198B
SN74ALS112A	16	Dual J-K Negative-Edge-Triggered Flip-Flop	✔	✔	✔		SDAS199A
SN74ALS133	16	13-Input Positive-NAND Gate	✔	✔	✔		SDAS202B
SN74ALS137A	16	3-to-8 Decoder/Demultiplexer With Address Registers	✔	✔	✔		SDAS203C
SN74ALS138A	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔		SDAS055E
SN74ALS139	16	Dual 2-to-4 Decoder/Demultiplexer	✔	✔	✔		SDAS204A
SN74ALS151	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS205A
SN74ALS153	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS206A
SN74ALS156	16	Dual 2-to-4 Decoder/Demultiplexer With Open-Collector Outputs		✔	✔		SDAS099C
SN74ALS157A	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS081C

commercial package description and availability

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RC = 52 pins (FB only)
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TQFP (plastic thin quad flatpack)
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PAG = 64 pins (FB only)
PM = 64 pins
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PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✦ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS158	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS081C
SN74ALS161B	16	4-Bit Synchronous Binary Counter	✔	✔	✔		SDAS024A
SN74ALS163B	16	4-Bit Synchronous Binary Counter	✔	✔	✔		SDAS024A
SN74ALS164A	14	8-Bit Parallel-Out Serial Shift Register		✔	✔		SDAS159D
SN74ALS165	16	8-Bit Parallel-In Shift Register	✔	✔	✔		SDAS157B
SN74ALS166	16	8-Bit Parallel-In Shift Register		✔	✔		SDAS156C
SN74ALS169B	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔		SDAS125B
SN74ALS174	16	Hex D-Type Flip-Flop With Clear	✔	✔	✔		SDAS207D
SN74ALS175	16	Quad D-Type Flip-Flop With Clear	✔	✔	✔		SDAS207D
SN74ALS191A	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔		SDAS210C
SN74ALS193A	16	4-Bit Synchronous Up/Down Binary Counter With Dual Clock and Clear	✔	✔	✔		SDAS211C
SN74ALS240A	20	Octal Buffer/Driver	✔	✔	✔		SDAS214C
SN74ALS240A-1	20	Octal Buffer/Driver		✔	✔		SDAS214C
SN74ALS241C	20	Octal Buffer/Driver	✔	✔	✔		SDAS153E
SN74ALS243A	14	Quad Bus Transceiver	✔	✔	✔		SDAS069B
SN74ALS244C	20	Octal Buffer/Driver	✔	✔	✔	✔	SDAS142C
SN74ALS244C-1	20	Octal Buffer/Driver		✔	✔		SDAS142C
SN74ALS245A	20	Octal Bus Transceiver	✔	✔	✔	✔	SDAS272
SN74ALS245A-1	20	Octal Bus Transceiver		✔	✔		SDAS272
SN74ALS251	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS215A
SN74ALS253	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS216A
SN74ALS257A	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS124C
SN74ALS258A	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔		SDAS124C
SN74ALS259	16	8-Bit Addressable Latch	✔	✔	✔		SDAS217A
SN74ALS273	20	Octal D-Type Flip-Flop With Clear	✔	✔	✔		SDAS218A
SN74ALS280	14	9-Bit Parity Generator/Checker		✔	✔		SDAS038C
SN74ALS299	20	8-Bit Universal Shift/Storage Register	✔	✔	✔		SDAS220B
SN74ALS323	20	8-Bit Universal Shift/Storage Register	✔	✔	✔		SDAS267A
SN74ALS373A	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	SDAS083B
SN74ALS374A	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	SDAS167B
SN74ALS518	20	8-Bit Identity Comparator		✔	✔		SDAS224B
SN74ALS520	20	8-Bit Identity Comparator	✔	✔	✔		SDAS224B
SN74ALS521	20	8-Bit Identity Comparator		✔	✔		SDAS224B
SN74ALS533A	20	Octal D-Type Transparent Latch		✔	✔		SDAS270
SN74ALS534A	20	Octal D-Type Flip-Flop	✔	✔	✔		SDAS168B
SN74ALS540	20	Octal Buffer/Driver		✔	✔		SDAS025C
SN74ALS540-1	20	Octal Buffer/Driver		✔	✔		SDAS025C
SN74ALS541	20	Octal Buffer/Driver	✔	✔	✔		SDAS025C

TEXAS INSTRUMENTS

ALS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS541-1	20	Octal Buffer/Driver		✔	✔		SDAS025C
SN74ALS561A	20	4-Bit Synchronous Binary Counter	✔	✔	✔		SDAS225A
SN74ALS563B	20	Octal D-Type Transparent Latch	✔	✔	✔		SDAS163A
SN74ALS564B	20	Octal D-Type Flip-Flop	✔	✔	✔		SDAS164B
SN74ALS568A	20	4-Bit Synchronous Up/Down Decade Counter		✔			SDAS229A
SN74ALS569A	20	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔		SDAS229A
SN74ALS573C	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	SDAS048D
SN74ALS574B	20	Octal D-Type Flip-Flop	✔	✔	✔		SDAS165B
SN74ALS575A	24	Octal D-Type Flip-Flop		✔	✔		SDAS165B
SN74ALS576B	20	Octal D-Type Flip-Flop	✔	✔	✔		SDAS065B
SN74ALS577A	24	Octal D-Type Flip-Flop		✔	✔		SDAS065B
SN74ALS580B	20	Octal D-Type Transparent Latch	✔	✔	✔		SDAS277
SN74ALS620A	20	Octal Bus Transceiver		✔	✔		SDAS226A
SN74ALS621A	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDAS226A
SN74ALS621A-1	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDAS226A
SN74ALS623A	20	Octal Bus Transceiver		✔	✔		SDAS226A
SN74ALS638A	20	Octal Bus Transceiver		✔	✔		SDAS123A
SN74ALS638A-1	20	Octal Bus Transceiver		✔	✔		SDAS123A
SN74ALS639A	20	Octal Bus Transceiver		✔	✔		SDAS123A
SN74ALS640B	20	Octal Bus Transceiver	✔	✔	✔		SDAS122A
SN74ALS640B-1	20	Octal Bus Transceiver		✔	✔		SDAS122A
SN74ALS641A	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDAS300
SN74ALS641A-1	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDAS300
SN74ALS642A	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDAS300
SN74ALS642A-1	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDAS300
SN74ALS645A	20	Octal Bus Transceiver	✔	✔	✔		SDAS278
SN74ALS645A-1	20	Octal Bus Transceiver		✔	✔		SDAS278
SN74ALS646A	24	Octal Registered Bus Transceiver		✔	✔		SDAS039F
SN74ALS646A-1	24	Octal Registered Bus Transceiver		✔	✔		SDAS039F
SN74ALS648A	24	Octal Registered Bus Transceiver		✔	✔		SDAS039F
SN74ALS651A	24	Octal Registered Bus Transceiver		✔	✔		SDAS066F
SN74ALS652A	24	Octal Registered Bus Transceiver	✔	✔	✔		SDAS066F
SN74ALS652A-1	24	Octal Registered Bus Transceiver		✔	✔		SDAS066F
SN74ALS653	24	Octal Registered Bus Transceiver	✔	✔	✔		SDAS066F
SN74ALS654	24	Octal Registered Bus Transceiver		✔	✔		SDAS066F
SN74ALS666	24	8-Bit D-Type Transparent Readback Latch		✔	✔		SDAS227A
SN74ALS667	24	8-Bit D-Type Transparent Readback Latch		✔	✔		SDAS227A
SN74ALS679	20	12-Bit Address Comparator		✔	✔		SDAS003C

![Texas Instruments logo]

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS688	20	8-Bit Identity Comparator	✔	✔	✔		SDAS228A
SN74ALS746	20	Octal Buffer/Line Driver		✔	✔		SDAS052A
SN74ALS760	20	Octal Buffer/Driver With Open-Collector Outputs		✔	✔		SDAS141A
SN74ALS804A	20	Hex 2-Input NAND Gate	✔	✔	✔		SDAS022C
SN74ALS805A	20	Hex 2-Input NOR Gate	✔	✔	✔		SDAS023C
SN74ALS832A	20	Hex 2-Input Positive-OR Gate	✔	✔	✔		SDAS017C
SN74ALS841	24	10-Bit Bus-Interface D-Type Latch		✔	✔		SDAS059C
SN74ALS843	24	9-Bit Bus-Interface D-Type Latch		✔	✔		SDAS232A
SN74ALS845	24	8-Bit Bus-Interface D-Type Latch		✔	✔		SDAS233A
SN74ALS857	24	Hex 2-to-1 Universal Multiplexer	✔	✔	✔		SDAS170A
SN74ALS867A	24	8-Bit Synchronous Up/Down Binary Counter		✔	✔		SDAS115C
SN74ALS869	24	8-Bit Synchronous Up/Down Binary Counter		✔	✔		SDAS115C
SN74ALS870	24	Dual 16 × 4 Register File		✔	✔		SDAS139A
SN74ALS873B	24	Dual 4-Bit D-Type Latch	✔	✔	✔		SDAS036D
SN74ALS874B	24	Dual 4-Bit D-Type Edge-Triggered Flip-Flop	✔	✔	✔		SDAS061C
SN74ALS876A	24	Dual 4-Bit D-Type Edge-Triggered Flip-Flop		✔	✔		SDAS061C
SN74ALS990	20	8-Bit D-Type Transparent Readback Latch		✔	✔		SDAS027B
SN74ALS992	24	9-Bit D-Type Transparent Readback Latch		✔	✔		SDAS028B
SN74ALS994	24	10-Bit D-Type Transparent Readback Latch		✔	✔		SDAS237A
SN74ALS996	24	8-Bit D-Type Edge-Triggered Readback Latch	✔	✔	✔		SDAS098B
SN74ALS996-1	24	8-Bit D-Type Edge-Triggered Readback Latch		✔	✔		SDAS098B
SN74ALS1004	14	Hex Inverting Buffer		✔	✔		SDAS074B
SN74ALS1005	14	Hex Inverting Buffer With Open-Collector Outputs	✔	✔	✔		SDAS240A
SN74ALS1034	14	Hex Noninverting Buffer	✔	✔	✔		SDAS053B
SN74ALS1035	14	Hex Noninverting Buffer With Open-Collector Outputs	✔	✔	✔		SDAS243A
SN74ALS1244A	20	Octal Buffer/Driver	✔	✔	✔		SDAS186B
SN74ALS1245A	20	Octal Bus Transceiver	✔	✔	✔		SDAS245A
SN74ALS1640A	20	Octal Bus Transceiver		✔			SDAS246B
SN74ALS1645A	20	Octal Bus Transceiver		✔	✔		SDAS246B
SN74ALS2240	20	Octal Buffer/Driver With Series Resistors		✔	✔		SDAS268A
SN74ALS2541	20	Octal Buffer/Driver With Series Resistors		✔	✔		SDAS273
SN74ALS29821	24	10-Bit Bus-Interface Flip-Flop	✔	✔	✔		SDAS145B
SN74ALS29823	24	9-Bit D-Type Flip-Flop	✔	✔	✔		SDAS146B
SN74ALS29827	24	10-Bit Buffer/Driver		✔	✔		SDAS095B
SN74ALS29828	24	10-Bit Buffer/Driver		✔	✔		SDAS095B
SN74ALS29833	24	8-Bit to 9-Bit Parity Bus Transceiver		✔	✔		SDAS119D
SN74ALS29841	24	10-Bit D-Type Bus-Interface Latch		✔	✔		SDAS149A
SN74ALS29854	24	8-to-9 Bit Parity Transceiver/Latch		✔	✔		SDAS118C
SN74ALS29863	24	9-Bit Bus Transceiver		✔	✔		SDAS096C

![Texas Instruments logo]

TEXAS INSTRUMENTS

ALVC
Advanced Low-Voltage
CMOS Technology Logic

One of the highest-performance 3.3-V bus-interface families is the ALVC family. These specially designed 3-V products are processed in 0.6-μ CMOS technology, giving typical propagation delays of less than 3 ns, along with current drive of 24 mA and static power consumption of 40 μA for bus-interface functions. The ALVC devices have bus-hold cells on inputs to eliminate the need for external pullup resistors for floating inputs. With over 50 Widebus™ and Widebus™ with series damping resistors already released and with gates/octals on the roadmap, ALVC is quickly becoming the industry standard for all 3.3-V logic applications. The family also features innovative functions that make it ideal for memory interleaving, multiplexing, and interfacing to SDRAMs.

The ALVC family is offered in the Widebus™ footprints with all of the advanced packaging such as shrink small-outline package (SSOP) and thin shrink small-outline package (TSSOP).

See www.ti.com/sc/logic for the most current data sheets.

DEVICE SELECTION GUIDE

ALVC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			SOIC	SSOP	TSSOP	TVSOP	SOT	
Gates and Octals								
SN74ALVC1G00	5	Single 2-Input Positive-NAND Gate					✢	SCES099C
SN74ALVC1G04	5	Single Inverter Gate					✢	SCES100C
SN74ALVC1G08	5	Single 2-Input Positive-AND Gate					✢	SCES102C
SN74ALVC1G14	5	Single Schmitt-Trigger Inverter					✢	SCES103D
SN74ALVC1G32	5	Single 2-Input Positive-OR Gate					✢	SCES104C
SN74ALVC1G79	5	Single Positive-Edge-Triggered D-Type Flip-Flop					✢	SCES105C
SN74ALVC1G125	5	Single Bus Buffer Gate					✢	SCES113D
SN74ALVC1G126	5	Single Bus Buffer Gate					✢	SCES114D
SN74ALVC00	14	Quad 2-Input Positive-NAND Gate	✔		✔	✔		SCES115C
SN74ALVC04	14	Hex Inverter	✔		✔	✔		SCES117F
SN74ALVC08	14	Quad 2-Input Positive-AND Gate	✔		✔	✔		SCES101D
SN74ALVC10	14	Triple 3-Input Positive-NAND Gate	✔		✔	✔		SCES106D
SN74ALVC14	14	Hex Inverter With Schmitt Trigger	✢		✢	✢		SCES107D
SN74ALVC32	14	Quad 2-Input Positive-OR Gate	✔		✔	✔		SCES108D
SN74ALVC74	14	Dual D-Type Flip-Flop With Preset and Clear	✢		✢	✢		SCES109E
SN74ALVC125	14	Quad Bus Buffer Gate (OE̅)	✔	✔	✔	✔		SCES110D
SN74ALVC126	14	Quad Bus Buffer Gate (OE)	✔	✔	✔	✔		SCES111E
SN74ALVCH244	20	Octal Buffer/Driver	✔		✔	✔		SCES112C
SN74ALVCH245	20	Octal Bus Transceiver	✢		✢	✢		SCES119C
SN74ALVCH373	20	Octal Transparent D-Type Latch	✢		✢	✢		SCES116D
SN74ALVCH374	20	Octal D-Type Flip-Flop	✢		✢	✢		SCES118D
Widebus™ Devices								
SN74ALVCH16240	48	16-Bit Buffer/Driver		✔	✔	✢		SCES045C
SN74ALVC16244A	48	16-Bit Buffer/Driver		✔	✔			SCAS250G
SN74ALVCH16244	48	16-Bit Buffer/Driver		✔	✔	✔		SCES014E
SN74ALVCH16245	48	16-Bit Bus Transceiver		✔	✔	✔		SCES015F
SN74ALVCH16260	56	12-to-24 Multiplexed D-Type Latch		✔	✔			SCES046E
SN74ALVCH16269	56	12-to-24 Registered Bus Exchanger		✔	✔			SCES019H
SN74ALVCH16270	56	12-to-24 Registered Bus Exchanger		✔	✔			SCES028F

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✢ = Planned

Texas Instruments

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			SOIC	SSOP	TSSOP	TVSOP	SOT	
SN74ALVCH16271	56	12-to-24 Multiplexed Bus Exchanger		✔	✔			SCES017E
SN74ALVCH16282	80	18-to-36 Registered Bus Exchanger					✔	SCES036C
SN74ALVC16334	48	16-Bit Universal Bus Driver		✔	✔	✔		SCES128C
SN74ALVCH16334	48	16-Bit Universal Bus Driver		✔	✔	✔		SCES090H
SN74ALVCH16344	56	1-to-4 Address Driver		✔	✔	✔		SCES054F
SN74ALVCH16373	48	16-Bit D-Type Transparent Latch		✔	✔			SCES020C
SN74ALVCH16374	48	16-Bit D-Type Flip-Flop		✔	✔			SCES021D
SN74ALVCH16409	56	9-Bit, 4-Port Universal Bus Exchanger		✔	✔			SCES022E
SN74ALVCH16500	56	18-Bit Universal Bus Transceiver		✔	✔			SCES023F
SN74ALVCH16501	56	18-Bit Universal Bus Transceiver		✔	✔			SCES024C
SN74ALVCH16524	56	18-Bit Registered Bus Transceiver		✔	✔			SCES080C
SN74ALVCH16525	56	18-Bit Registered Bus Transceiver		✔	✔			SCES059C
SN74ALVCH16543	56	16-Bit Registered Bus Transceiver		✔	✔			SCES025D
SN74ALVCH16600	56	18-Bit Universal Bus Transceiver		✔	✔			SCES030D
SN74ALVCH16601	56	18-Bit Universal Bus Transceiver		✔	✔			SCES027D
SN74ALVCH16646	56	16-Bit Registered Bus Transceiver		✔	✔	✔		SCES032E
SN74ALVCH16721	56	20-Bit Bus-Interface Flip-Flop		✔	✔	✔		SCES052D
SN74ALVCH16820	56	10-Bit Bus-Interface Flip-Flop With Dual Outputs		✔	✔			SCES035E
SN74ALVCH16821	56	20-Bit Bus-Interface Flip-Flop		✔	✔			SCES037C
SN74ALVCH16823	56	18-Bit Bus-Interface Flip-Flop		✔	✔	✔		SCES038D
SN74ALVCH16825	56	18-Bit Buffer/Driver		✔	✔			SCES039C
SN74ALVCH16827	56	20-Bit Buffer/Driver		✔	✔			SCES041C
SN74ALVCH16831	80	1-to-4 Address Driver					✔	SCES083D
SN74ALVCH16832	64	1-to-4 Address Driver			✔			SCES098D
SN74ALVC16834	56	18-Bit Universal Bus Driver		✔	✔	✔		SCES140B
SN74ALVC16835	56	18-Bit Universal Bus Driver		✔	✔	✔		SCES125D
SN74ALVCH16835	56	18-Bit Universal Bus Driver		✔	✔	✔		SCES053E
SN74ALVCH16841	56	20-Bit Bus-Interface D-Type Latch		✔	✔			SCES043D
SN74ALVCH16863	48	18-Bit Bus Transceiver		✔	✔			SCES060B
SN74ALVCH16901	64	18-Bit Universal Bus Transceiver With Parity Generator/Checker			✔			SCES010E
SN74ALVCH16952	56	16-Bit Registered Bus Transceiver		✔	✔	✔		SCES011D
SN74ALVC162334	48	16-Bit Universal Bus Driver		✔	✔	✔		SCE127C
SN74ALVC162831	80	1-to-4 Address Driver					✔	SCAS605A
SN74ALVC162834	56	18-Bit Universal Bus Driver		✔	✔	✔		SCES172A
SN74ALVC162835	56	18-Bit Universal Bus Driver		✔	✔	✔		SCES126E
SN74ALVC162836	56	20-Bit Universal Bus Driver		✔	✔	✔		SCES129B
SN74ALVC164245	48	16-Bit Transceiver and 3.3-V to 5-V Shifter		✔	✔			SCAS416F

TEXAS INSTRUMENTS

ALVC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			SOIC	SSOP	TSSOP	TVSOP	SOT	
Widebus™ Devices With Series Damping Resistors								
SN74ALVCHR16269A	56	12-to-24 Registered Bus Exchanger		✔	✔	✔		SCES050K
SN74ALVCH162244	48	16-Bit Buffer/Driver		✔	✔			SCES065C
SN74ALVCHR162245	48	16-Bit Bus Transceiver With Input and Output Series Damping Resistors		✔	✔			SCES064C
SN74ALVCH162260	56	12-to-24 Multiplexed D-Type Latch With Series Damping Resistors		✔	✔			SCAS570G
SN74ALVCH162268	56	12-to-24 Registered Bus Exchanger		✔	✔			SCES018F
SN74ALVCHR162269A	56	12-to-24 Registered Bus Exchanger With Input and Output Series Damping Resistors		✔	✔			Call
SN74ALVCH162334	48	16-Bit Universal Bus Driver With Series Damping Resistors on B Port		✔	✔	✔	✔	SCES120E
SN74ALVCH162344	56	1-to-4 Address Driver		✔	✔	✔	✔	SCES085E
SN74ALVCH162374	48	16-Bit D-Type Flip-Flop		✔	✔			SCES092B
SN74ALVCHR162409	56	9-Bit, 4-Port Universal Bus Exchanger With Input and Output Series Damping Resistors		✔	✔			SCES056F
SN74ALVCH162525	56	18-Bit Registered Bus Transceiver		✔	✔			SCES058D
SN74ALVCH162601	56	18-Bit Universal Bus Transceiver		✔	✔			SCES026F
SN74ALVCHR162601	56	18-Bit Universal Bus Transceiver With Input and Output Series Damping Resistors		✔	✔	✔		SCES123F
SN74ALVCH162721	56	20-Bit Bus-Interface Flip-Flop		✔	✔			SCES055D
SN74ALVCH162820	56	10-Bit Bus-Interface Flip-Flop With Dual Outputs		✔	✔			SCES012E
SN74ALVCH162827	56	20-Bit Buffer/Driver		✔	✔	✔		SCES013E
SN74ALVCHS162830	80	1-to-2 Address Driver				✔		SCES097E
SN74ALVCH162831	80	1-to-4 Address Driver				✔		SCES084E
SN74ALVCH162832	64	1-to-4 Address Driver			✔			SCAS588E
SN74ALVCH162835	56	18-Bit Universal Bus Driver		✔	✔	✔		SCES121D
SN74ALVCH162836	56	20-Bit Universal Bus Driver		✔	✔	✔		SCES122D

![Texas Instruments logo]

ALVT
Advanced Low-Voltage
BiCMOS Technology Logic

ALVT is a 5-V tolerant, 3.3-V and 2.5-V product, which uses 0.6-μ BiCMOS technology for advanced bus-interface functions. ALVT provides superior performance, delivering 2.4-ns propagation delays at 3.3 V (28% faster than LVT) and 3 ns at 2.5 V (6% faster than LVT at 3.3 V), current drive of 64 mA, and pin-for-pin compatibility with existing ABT and LVT families.

ALVT operates at LVTTL signal levels in telecom and networking high-performance system point-to-point or distributed load backplanes applications. ALVT is an excellent migration path from ABT or LVT.

Performance characteristics of the ALVT family are:
- 3.3-V or 2.5-V operation with 5-V tolerant I/O capability to interface with a mixed-voltage environment. The I/Os can handle up to 7 V, which allows them to act as 5-V to 3-V or 2.5-V translators.
- Speed – Provides high performance with maximum propagation delays of 2.4 ns at 3.3 V and 3 ns at 2.5 V for buffers.
- Drive – Provides up to 64 mA of drive at 3.3-V V_{CC} and 24 mA at 2.5-V V_{CC}, yet consumes less than 330 μW of standby power.

Additional features include:
- Live insertion – ALVT devices incorporate I_{off} and power-up 3-state (PU3S) circuitry to protect the devices in live-insertion applications and make them ideally suited for hot-insertion applications. I_{off} prevents the devices from being damaged during partial power down, and PU3S forces the outputs to the high-impedance state during power up and power down.
- Bus hold – Eliminates floating inputs by holding them at the last valid logic state. This eliminates the need for external pullup and pulldown resistors.
- Damping-resistor option – TI implements series damping resistors on selected devices, which not only reduces overshoot and undershoot, but also matches the line impedance, minimizing ringing.
- Packaging – ALVT devices are available in shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP).

See www.ti.com/sc/logic for the most current data sheets.

DEVICE SELECTION GUIDE

ALVT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			SSOP	TSSOP	TVSOP	
SN74ALVT162827	56	20-Bit Buffer/Driver With Series Resistors	÷	÷	÷	Call
SN74ALVTH16240	48	16-Bit Buffer/Driver	÷	÷	÷	SCES138A
SN74ALVTH16244	48	16-Bit Buffer/Driver	✔	✔	✔	SCES070F
SN74ALVTH16245	48	16-Bit Bus Transceiver	÷	÷	÷	SCES066E
SN74ALVTH16260	56	12-to-24 Multiplexed D-Type Latch	÷	÷	÷	Call
SN74ALVTH16373	48	16-Bit Transparent D-Type Latch	✔	✔	✔	SCES067F
SN74ALVTH16374	48	16-Bit Edge-Triggered D-Type Flip-Flop	✔	✔	✔	SCES068F
SN74ALVTH16501	56	18-Bit Universal Bus Transceiver	÷	÷	÷	SCES071D
SN74ALVTH16543	56	16-Bit Registered Bus Transceiver	÷	÷	÷	SCES073C
SN74ALVTH16601	56	18-Bit Universal Bus Transceiver	÷	÷	÷	SCES143
SN74ALVTH16652	56	16-Bit Registered Bus Transceiver	÷	÷	÷	SCES192
SN74ALVTH16721	56	20-Bit Flip-Flop	÷	÷	÷	SCES139B
SN74ALVTH16821	56	20-Bit Bus-Interface Flip-Flop	✔	✔	✔	SCES078E
SN74ALVTH16827	56	20-Bit Buffer/Driver	✔	✔	✔	SCES076E
SN74ALVTH162244	48	16-Bit Buffer/Driver With Series Damping Resistors	✔	✔	✔	SCES074E
SN74ALVTH162245	48	16-Bit Bus Transceiver With Series Damping Resistors	÷	÷	÷	Call
SN74ALVTHR16245	48	16-Bit Transceiver With I/O Series Resistors	÷	÷	÷	Call

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
÷ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

TEXAS INSTRUMENTS

AS
Advanced Schottky Logic

The AS family of high-performance bipolar logic includes over 90 functions that offer high drive capabilities.

This family, combined with the ALS family, can be used to optimize system speed and power through performance budgeting where BiCMOS logic is used. By using AS in speed-critical paths and ALS where speed is less critical, designers can optimize speed and power performance.

The AS family includes gates, flip-flops, counters, drivers, transceivers, registered transceivers, readback latches, clock drivers, register files, and multiplexers.

See www.ti.com/sc/logic for the most current data sheets.

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74AS00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	SDAS187A
SN74AS02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔	SDAS111B
SN74AS04	14	Hex Inverter	✔	✔	✔	SDAS063B
SN74AS08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔	SDAS191A
SN74AS10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔	SDAS002B
SN74AS11	16	Triple 3-Input Positive-AND Gate	✔	✔	✔	SDAS009C
SN74AS20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔	SDAS192B
SN74AS21	14	Dual 4-Input Positive-AND Gate		✔	✔	SDAS085B
SN74AS27	14	Triple 3-Input Positive-NOR Gate	✔	✔	✔	SDAS112B
SN74AS30	14	8-Input Positive-NAND Gate	✔	✔	✔	SDAS010B
SN74AS32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔	SDAS113B
SN74AS74A	14	Dual D-Type Flip-Flop	✔	✔	✔	SDAS143C
SN74AS109A	16	Dual J-$\overline{\text{K}}$ Edge-Triggered Flip-Flop	✔	✔	✔	SDAS198B
SN74AS138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔	SDAS055E
SN74AS151	16	8-to-1 Data Selector/Multiplexer		✔	✔	SDAS205A
SN74AS153	16	Dual 4-to-1 Data Selector/Multiplexer		✔	✔	SDAS206A
SN74AS157	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	SDAS081C
SN74AS158	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	SDAS081C
SN74AS161	16	4-Bit Synchronous Binary Counter	✔	✔	✔	SDAS024A
SN74AS163	16	4-Bit Synchronous Binary Counter	✔	✔	✔	SDAS024A
SN74AS169A	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔	SDAS125B
SN74AS174	16	Hex D-Type Flip-Flop With Clear	✔	✔	✔	SDAS207D
SN74AS175B	16	Quad D-Type Flip-Flop With Clear	✔	✔	✔	SDAS207D
SN74AS181A	24	4-Bit Arithmetic Logic Unit	✔	✔	✔	SDAS209B
SN74AS194	16	4-Bit Bidirectional Universal Shift Register	✔	✔	✔	SDAS212A
SN74AS230A	14	Octal Buffer/Driver		✔	✔	SDAS213B
SN74AS240A	20	Octal Buffer/Driver	✔	✔	✔	SDAS214C
SN74AS241A	20	Octal Buffer/Driver	✔	✔	✔	SDAS153E
SN74AS244A	20	Octal Buffer/Driver	✔	✔	✔	SDAS142C
SN74AS245	20	Octal Bus Transceiver	✔	✔	✔	SDAS272

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
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RC = 52 pins (FB only)
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TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
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PN = 80 pins
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PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74AS250A	20	16-to-1 Data Generator/Multiplexer	✔	✔	✔	SDAS137A
SN74AS253A	16	Dual 4-to-1 Data Selector/Multiplexer		✔	✔	SDAS216A
SN74AS257	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	SDAS124C
SN74AS258	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔	SDAS124C
SN74AS280	14	9-Bit Parity Generator/Checker		✔	✔	SDAS038C
SN74AS286	14	9-Bit Parity Generator/Checker	✔	✔	✔	SDAS050B
SN74AS298A	16	Quad 2-to-1 Multiplexer		✔	✔	SDAS219B
SN74AS373	20	Octal D-Type Transparent Latch	✔	✔	✔	SDAS083B
SN74AS374	20	Octal D-Type Flip-Flop	✔	✔	✔	SDAS167B
SN74AS533A	20	Octal D-Type Transparent Latch		✔	✔	SDAS270
SN74AS573A	20	Octal D-Type Transparent Latch	✔	✔	✔	SDAS048D
SN74AS574	20	Octal D-Type Flip-Flop	✔	✔	✔	SDAS165B
SN74AS575	24	Octal D-Type Flip-Flop	✔	✔	✔	SDAS165B
SN74AS576	20	Octal D-Type Flip-Flop	✔	✔	✔	SDAS065B
SN74AS639	20	Octal Bus Transceiver		✔	✔	SDAS123A
SN74AS640	20	Octal Bus Transceiver	✔	✔	✔	SDAS122A
SN74AS641	20	Octal Bus Transceiver		✔	✔	SDAS300
SN74AS645	20	Octal Bus Transceiver	✔	✔	✔	SDAS278
SN74AS646	24	Octal Registered Bus Transceiver	✔	✔	✔	SDAS039F
SN74AS648	24	Octal Registered Bus Transceiver		✔	✔	SDAS039F
SN74AS651	24	Octal Registered Bus Transceiver	✔	✔	✔	SDAS066F
SN74AS652	24	Octal Registered Bus Transceiver	✔	✔	✔	SDAS066F
SN74AS756	20	Octal Buffer/Driver	✔	✔	✔	SDAS040B
SN74AS757	20	Octal Buffer/Driver		✔	✔	SDAS040B
SN74AS760	20	Octal Buffer/Driver	✔	✔	✔	SDAS141A
SN74AS804B	20	Hex 2-Input NAND Gate	✔	✔	✔	SDAS022C
SN74AS805B	20	Hex 2-Input NOR Gate	✔	✔	✔	SDAS023C
SN74AS808B	20	Hex 2-Input Positive-AND Gate	✔	✔	✔	SDAS018C
SN74AS821A	24	10-Bit Bus-Interface Flip-Flop	✔	✔	✔	SDAS230A
SN74AS823A	24	9-Bit Bus-Interface Flip-Flop	✔	✔	✔	SDAS231A
SN74AS825A	24	8-Bit Bus-Interface Flip-Flop	✔	✔	✔	SDAS020B
SN74AS832B	20	Hex 2-Input OR Gate	✔	✔	✔	SDAS017C
SN74AS867	24	8-Bit Synchronous Up/Down Binary Counter	✔	✔	✔	SDAS115C
SN74AS869	24	8-Bit Synchronous Up/Down Binary Counter	✔	✔	✔	SDAS115C
SN74AS873A	24	Dual 4-Bit D-Type Flip-Flop	✔	✔	✔	SDAS036D
SN74AS874	24	Dual 4-Bit D-Type Edge-Triggered Flip-Flop		✔	✔	SDAS061C
SN74AS876	24	Dual 4-Bit D-Type Edge-Triggered Flip-Flop		✔	✔	SDAS061C
SN74AS885	24	8-Bit Magnitude Comparator	✔	✔	✔	SDAS236A

TEXAS
INSTRUMENTS

AS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74AS1000A	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	SDAS056B
SN74AS1004A	14	Hex Inverting Buffer	✔	✔	✔	SDAS074B
SN74AS1008A	14	Quad 2-Input Positive-AND Gate		✔	✔	SDAS071B
SN74AS1032A	14	Quad 2-Input Positive-OR Gate	✔	✔	✔	SDAS072B
SN74AS1034A	14	Hex Noninverting Buffer	✔	✔	✔	SDAS053B
SN74AS1804	20	Hex 2-Input NAND Gate		✔		SDAS042C
SN74AS1805	20	Hex 2-Input NOR Gate		✔		SDAS043C
SN74AS1808	20	Hex 2-Input Positive-AND Gate		✔		SDAS044C
SN74AS1832	20	Hex 2-Input Positive-OR Gate		✔		SDAS045C
SN74AS4374B	20	8-Bit Dual-Rank Synchronizer		✔	✔	SDAS109D

![Texas Instruments logo] **TEXAS INSTRUMENTS**

AVC
Advanced Very-Low-Voltage
CMOS Logic

TI's new AVC logic family provides designers the tools to create tomorrow's advanced high-speed systems with propagation delays of less than 2 ns. Though optimized for 2.5-V systems, AVC logic supports operating voltages between 1.2 V and 3.3 V. The AVC family features TI's new Dynamic Output Control (DOC™) circuitry that dynamically lowers circuit output impedance during signal transition for fast rise and fall times, and then raises the impedance after signal transmission to reduce ringing.

Trends in digital electronics design emphasize lower power consumption, lower supply voltages, faster operating speeds, smaller timing budgets, and heavier loads. Many designs are making the transition from 3.3 V to 2.5 V with bus speeds increasing beyond 100 MHz. Signal integrity need not be compromised to meet these design requirements. The TI AVC family is designed to meet the needs of these high-speed, low-voltage systems, including next-generation high-performance workstations, PCs, networking servers, and telecommunications switching equipment.

Key features:

- Sub-2-ns maximum t_{pd} at 2.5 V for AVC16245
- Designed for next-generation, high-performance PCs, workstations, and servers
- DOC circuitry enhances high-speed, low-noise operation
- Supports mixed-voltage systems
- Optimized for 2.5 V; operable from 1.2 V to 3.3 V
- Bus-hold feature eliminates need for external resistors on unused input pins.
- I_{off} supports partial power down.

See www.ti.com/sc/logic for the most current data sheets.

AVC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			SOT	TSSOP	TVSOP	LFBGA	
SN74AVC1G04	5	Single Inverter	✛				SCES228
SN74AVC1G125	5	Single Bus-Buffer Gate With 3-State Outputs	✛				SCES233A
SN74AVC1G244	8	Dual Buffer/Driver With 3-State Outputs	✛				SCES252
SN74AVC00	14	Quad 2-Input Positive NAND Gate		✛	✛		SCES146B
SN74AVC125	24	Quad Bus-Buffer Gate With 3-State Outputs		✛	✛		SCES253A
SN74AVC245	20	Octal Bus Transceiver With 3-State Outputs		✔	✔		SCES263
SN74AVCH245	20	Octal Bus Transceiver With 3-State Outputs		✔	✔		SCES264
SN74AVC16244	48	16-Bit Buffer/Driver With 3-State Outputs		✛	✛		SCES141G
SN74AVCH16244	48	16-Bit Buffer/Driver With 3-State Outputs		✛	✛		SCES150B
SN74AVC16245	48	16-Bit Bus Transceiver With 3-State Outputs		✔	✔		SCEA006A
SN74AVCH16245	48	16-Bit Bus Transceiver With 3-State Outputs		✔	✔		SCES151B
SN74AVC16269	56	12-Bit to 24-Bit Registered Bus Exchanger With 3-State Outputs		✛	✛		SCES152C
SN74AVCH16269	56	12-Bit to 24-Bit Registered Bus Exchanger With 3-State Outputs		✛	✛		SCES153C
SN74AVC16334	48	16-Bit Universal Bus Driver With 3-State Outputs		✛	✛		SCES154C
SN74AVCH16334	48	16-Bit Universal Bus Driver With 3-State Outputs		✛	✛		SCES155C
SN74AVC16373	48	16-Bit Transparent D-Type Latch With 3-State Outputs		✛	✛		SCES156B
SN74AVCH16373	48	16-Bit Transparent D-Type Latch With 3-State Outputs		✛	✛		SCES157B
SN74AVC16374	48	16-Bit Edge-Triggered D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES158B
SN74AVCH16374	48	16-Bit Edge-Triggered D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES159B
SN74AVC16501	56	18-Bit Universal Bus Transceiver With 3-State Outputs		✛	✛		SCES160B
SN74AVCH16501	56	18-Bit Universal Bus Transceiver With 3-State Outputs		✛	✛		SCES161B
SN74AVC16601	56	18-Bit Universal Bus Transceiver With 3-State Outputs		✛	✛		SCES162C
SN74AVCH16601	56	18-Bit Universal Bus Transceiver With 3-State Outputs		✛	✛		SCES163B
SN74AVC16646	56	16-Bit Bus Transceiver and Register With 3-State Outputs		✛	✛		Call
SN74AVCH16646	56	16-Bit Bus Transceiver and Register With 3-State Outputs		✛	✛		Call
SN74AVC16721	56	20-Bit D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES164C
SN74AVCH16721	56	20-Bit D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES165C
SN74AVC16722	56	22-Bit D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES166C
SN74AVCH16722	56	22-Bit D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES167C
SN74AVC16820	56	10-Bit D-Type Flip-Flop With 3-State Outputs		✛	✛		SCES173C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

![Texas Instruments logo] TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			SOT	TSSOP	TVSOP	LFBGA	
SN74AVCH16820	56	10-Bit D-Type Flip-Flop With 3-State Outputs		✤	✤		SCES174C
SN74AVC16821	56	20-Bit Bus-Interface Flip-Flop With 3-State Outputs		✤	✤		SCES175C
SN74AVCH16821	56	20-Bit Bus-Interface Flip-Flop With 3-State Outputs		✤	✤		SCES177C
SN74AVC16827	56	20-Bit Buffer/Driver With 3-State Outputs		✤	✤		SCES176C
SN74AVCH16827	56	20-Bit Buffer/Driver With 3-State Outputs		✤	✤		SCES178C
SN74AVC16831	80	1-to-4 Address Register/Driver With 3-State Outputs		✤	✤		SCES179C
SN74AVCH16831	80	1-to-4 Address Register/Driver With 3-State Outputs		✤	✤		SCES180C
SN74AVC16834	56	18-Bit Universal Bus Driver With 3-State Outputs		✤	✤		SCES183C
SN74AVCH16834	56	18-Bit Universal Bus Driver With 3-State Outputs		✤	✤		SCES184C
SN74AVC16835	56	18-Bit Universal Bus Driver With 3-State Outputs		✤	✤		SCES168D
SN74AVCH16835	56	18-Bit Universal Bus Driver With 3-State Outputs		✤	✤		SCES169C
SN74AVC16836	56	20-Bit Universal Bus Driver With 3-State Outputs		✤	✤		SCES170C
SN74AVCH16836	56	20-Bit Universal Bus Driver With 3-State Outputs		✤	✤		SCES171C
SN74AVC32245	96	32-Bit Bus Transceiver With 3-State Outputs				✤	SCES191A
SN74AVCH32245	96	32-Bit Bus Transceiver With 3-State Outputs				✤	SCES268
SN74AVC32501	114	36-Bit Universal Bus Transceiver With 3-State Outputs				✤	SCES272A
SN74AVCH32501	114	36-Bit Universal Bus Transceiver With 3-State Outputs				✤	SCES186

TEXAS INSTRUMENTS

BCT
BiCMOS Technology Logic

BCT is a family of 8-, 9-, and 10-bit drivers, latches, transceivers, and registered transceivers. Designed specifically for bus-interface applications, BCT offers TTL I/O with high speeds, 64-mA output drive, and very low power in the disabled mode. Over 50 BCT functions are in production.

A family of fast, high-drive bus-interface functions that provides the incident-wave switching required by large backplane applications has been incorporated into the BCT offering. Designed specifically to ensure incident-wave switching down to 25 Ω, the devices in the BiCMOS low-impedance driver family can maximize the speed and reliability of heavily loaded systems. Each device in this series delivers 188 mA of I_{OL} drive current.

Also included in TI's BCT family are devices with series damping resistors to reduce overshoot and undershoot that can occur in memory-driving applications.

See www.ti.com/sc/logic for the most current data sheets.

BCT

DEVICE	NO. PINS	FUNCTION	MIL	PDIP	SOIC	SSOP	LITERATURE REFERENCE
SN74BCT125A	14	Quad Bus Buffer Gate (OE)	✔	✔	✔		SCBS032E
SN74BCT126A	14	Quad Bus Buffer Gate (OE)	✔	✔	✔		SCBS252A
SN74BCT240	20	Octal Buffer/Driver	✔	✔	✔	✔	SCBS004E
SN74BCT241	20	Octal Buffer/Driver	✔	✔	✔	✔	SCBS005D
SN74BCT244	20	Octal Buffer/Driver	✔	✔	✔	✔	SCBS006E
SN74BCT245	20	Octal Bus Transceiver	✔	✔	✔	✔	SCBS013F
SN74BCT373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	SCBS016C
SN74BCT374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	SCBS019B
SN74BCT540A	20	Octal Buffer/Driver	✔	✔	✔		SCBS012D
SN74BCT541A	20	Octal Buffer/Driver	✔	✔	✔		SCBS011D
SN74BCT543	24	Octal Registered Bus Transceiver	✔	✔	✔		SCBS026C
SN74BCT574	20	Octal D-Type Flip-Flop	✔			✔	SCBS074B
SN74BCT623	20	Octal Bus Transceiver	✔	✔	✔		SCBS020A
SN74BCT640	20	Octal Bus Transceiver	✔	✔	✔		SCBS025C
SN74BCT646	24	Octal Registered Bus Transceiver	✔	✔	✔		SCBS037C
SN74BCT652	24	Octal Registered Bus Transceiver	✔	✔	✔		SCBS038A
SN74BCT756	20	Octal Buffer/Driver		✔	✔		SCBS056B
SN74BCT760	20	Octal Buffer/Driver	✔	✔	✔		SCBS034B
SN74BCT2240	20	Octal Buffer/Driver With Series Resistors	✔	✔	✔	✔	SCBS030D
SN74BCT2244	20	Octal Buffer/Driver With Series Resistors	✔	✔	✔		SCBS017C
SN74BCT2245	20	Octal Bus Transceiver With Series Resistors		✔	✔	✔	SCBS102B
SN74BCT2827C	24	10-Bit Buffer/Driver With Series Resistors	✔	✔	✔		SCBS007E
SN74BCT2828B	24	10-Bit Buffer/Driver With Series Resistors		✔	✔		SCBS058A
SN74BCT2953	24	Octal Bus Registered Transceiver		✔	✔		SCBS105B
SN74BCT25244	24	25-Ω Octal Buffer/Driver		✔	✔		SCBS064A
SN74BCT25245	24	25-Ω Octal Bus Transceiver		✔	✔		SCBS053B
SN74BCT29821	24	10-Bit Bus-Interface Flip-Flop		✔	✔		SCBS021D
SN74BCT29823	24	9-Bit Bus-Interface Flip-Flop		✔	✔		SCBS018D
SN74BCT29827B	24	10-Bit Buffer/Driver		✔	✔		SCBS008C
SN74BCT29834	24	8-to-9-Bit Parity Bus Transceiver		✔	✔		SCBS256

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74BCT29841	24	10-Bit Bus-Interface D-Type Latch		✔	✔		SCBS024C
SN74BCT29843	24	9-Bit Bus-Interface D-Type Latch		✔	✔		SCBS022C
SN74BCT29854	24	8-to-9-Bit Parity Bus Transceiver		✔	✔		SCBS257
SN74BCT29863B	24	9-Bit Bus Transceiver		✔	✔		SCBS015D

TEXAS
INSTRUMENTS

64BCT
64-Series
BiCMOS Technology Logic

The 64BCT family offers all the features found in TI's standard BCT family. In addition, the family is characterized for operation from –40°C to 85°C and incorporates circuitry to protect the device in live-insertion applications.

See www.ti.com/sc/logic for the most current data sheets.

64BCT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY PDIP	AVAILABILITY SOIC	LITERATURE REFERENCE
SN64BCT125A	14	Quad Bus Buffer Gate (OE)	✔	✔	SCBS052B
SN64BCT126A	14	Quad Bus Buffer Gate (OE)	✔	✔	SCBS051C
SN64BCT240	20	Octal Buffer/Driver	✔	✔	SCBS049A
SN64BCT241	20	Octal Buffer/Driver	✔	✔	SCBS046C
SN64BCT244	20	Octal Buffer/Driver	✔	✔	SCBS027A
SN64BCT245	20	Octal Bus Transceiver	✔	✔	SCBS040A
SN64BCT306	8	2-Bit Buffer/Driver	✔	✔	SCBS048B
SN64BCT541A	20	Octal Buffer/Line Driver	✔	✔	SCBS031B
SN64BCT757	20	Octal Buffer/Driver	✔	✔	SCBS479
SN64BCT25244	24	25-Ω Octal Buffer/Driver	✔	✔	SCBS477
SN64BCT25245	24	25-Ω Octal Bus Transceiver	✔	✔	SCBS060A
SN64BCT29828B	24	10-Bit Buffer/Driver	✔	✔	SCBS478

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✦ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

![Texas Instruments logo] TEXAS INSTRUMENTS

BTA
Bus-Termination Arrays

The BTA family from TI offers a space-saving, efficient, and effective solution to bus-termination requirements. In high-speed digital systems with long transmission lines, reflecting waves on the line can cause voltage undershoots and overshoots that lead to malfunctions at the driven input. A BTA is a series of diodes that clamps a signal on a bus or any other signal trace using high-frequency logic to eliminate overshoot and undershoot problems.

See www.ti.com/sc/logic for the most current data sheets.

BTA

DEVICE	NO. PINS	FUNCTION	AVAILABILITY PDIP	AVAILABILITY SOIC	LITERATURE REFERENCE
SN74ACT1071	14	10-Bit Bus-Termination Array With Bus Hold		✔	SCAS192
SN74ACT1073	20	16-Bit Bus-Termination Array With Bus Hold		✔	SCAS193
SN74F1016	20	16-Bit Schottky Barrier Diode R-C Bus-Termination Array		✔	SDFS093
SN74F1056	16	8-Bit Schottky Barrier Diode Bus-Termination Array		✔	SDFS085A
SN74S1050	16	12-Bit Schottky Barrier Diode Bus-Termination Array	✔	✔	SDLS015A
SN74S1051	16	12-Bit Schottky Barrier Diode Bus-Termination Array	✔	✔	SDLS018A
SN74S1052	20	16-Bit Schottky Barrier Diode Bus-Termination Array	✔	✔	SDLS016A
SN74S1053	20	16-Bit Schottky Barrier Diode Bus-Termination Array	✔	✔	SDLS017A
SN74S1056	16	8-Bit Schottky Barrier Diode Bus-Termination Array		✔	SDLS019B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT   = 24/28 pins

schedule

✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN   = 20/28/44/68/84 pins

QFP (quad flatpack)
RC   = 52 pins (FB only)
PH   = 80 pins (FIFO only)
PQ   = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW   = 16/20/24/28 pins

SOP (small-outline package)
PS   = 8 pins
NS   = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB   = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL   = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

![Texas Instruments logo] **TEXAS INSTRUMENTS**

BTL/FB+
Backplane Transceiver Logic

The FB series devices are used for high-speed bus applications and are fully compatible with the IEEE 1194.1-1991 (BTL) and IEEE 896-1991 (Futurebus+) standards. These transceivers are available in 7-, 8-, 9-, and 18-bit versions with TTL and BTL translation in performance below 5 ns. Other features include drive up to 100 mA and bias pins for live-insertion applications.

See www.ti.com/sc/logic for the most current data sheets.

BTL/FB+

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	QFP	TQFP	
SN74FB1650	100	18-Bit TTL/BTL Universal Storage Transceiver			✔	SCBS178I
SN74FB1651	100	17-Bit TTL/BTL Universal Storage Transceiver With Buffered Clock Lines			✔	SCBS177I
SN74FB1653	100	17-Bit LVTTL-to-BTL Universal Storage Transceiver With Buffered Clock Lines			✔	SCBS702A
SN74FB2031	52	9-Bit TTL/BTL Address/Data Transceiver	✔	✔		SCBS176I
SN74FB2032	52	9-Bit TTL/BTL Competition Transceiver		✔		SCBS175F
SN74FB2033A	52	8-Bit TTL/BTL Registered Transceiver	✔	✔		SCBS174H
SN74FB2040	52	8-Bit TTL/BTL Transceiver	✔	✔		SCBS173G
SN74FB2041A	52	7-Bit TTL/BTL Transceiver		✔		SCBS172G

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB   = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL   = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

![Texas Instruments logo]
Texas Instruments

CBT
Crossbar Technology Logic

In today's computing market, power and speed are two of the main concerns. CBT can address both of these issues in bus-interface applications. CBT enables a bus-interface device to function as a very fast bus switch, effectively isolating buses when the switch is open and offering very little propagation delay when the switch is closed. These devices can function as high-speed bus interfaces between computer-system components such as the central processing unit (CPU) and memory. CBT devices also can be used as 5-V to 3.3-V translators, allowing designers to mix 5-V or 3.3-V components in the same system.

The CBT devices are available in advanced packaging, such as the shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP) for reduced board area.

See www.ti.com/sc/logic for the most current data sheets.

CBT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	SOIC	QSOP	SSOP	TSSOP	TVSOP	SOT	
SN74CBT1G125	5	Single FET Bus Switch							✔	SCDS046B
SN74CBTD1G125	5	Single FET Bus Switch With Level Shifting							✦	SCDS063B
SN74CBTS1G125	5	Single FET Bus Switch							✦	SCDS064A
SN74CBT1G384	5	Single FET Bus Switch							✦	SCDS065A
SN74CBTD1G384	5	Single FET Bus Switch With Level Shifting							✦	SCDS066B
SN74CBTS1G384	5	Single FET Bus Switch							✦	SCDS067A
SN74CBT3125	14, 16	Quad FET Bus Switch		✔	✔	✔	✔	✔		SCDS021E
SN74CBT3126	14	Quad FET Bus Switch		✔	✔	✔	✔	✔		SCDS020E
SN74CBT3244	20	Octal FET Bus Switch		✔	✔	✔	✔	✔		SCDS001H
SN74CBT3245A	20	Octal FET Bus Switch		✔	✔	✔	✔	✔		SCDS002J
SN74CBT3251	16	1-of-8 FET Multiplexer/Demultiplexer		✔		✔	✔			SCDS019G
SN74CBT3253	16	Dual 1-of-4 FET Multiplexer/Demultiplexer		✔	✔	✔	✔	✔		SCDS018I
SN74CBT3257	16	4-Bit 1-of-2 FET Multiplexer/Demultiplexer		✔	✔	✔	✔	✔		SCDS017I
SN74CBT3306	8	Dual FET Bus Switch		✔			✔			SCDS016E
SN74CBTD3306	8	Dual FET Bus Switch With Level Shifting		✔			✔			SCDS030F
SN74CBTS3306	8	Dual FET Bus Switch With Schottky Diode Clamping		✔			✔			SCDS029E
SN74CBT3345	20	8-Bit FET Bus Switch		✔		✔	✔	✔		SCDS027D
SN74CBT3383	24	10-Bit FET Bus-Exchange Switch	✔	✔	✔	✔	✔			SCDS003J
SN74CBTH3383	24	10-Bit FET Bus-Exchange Switch With Bus Hold		✦		✦	✦			SCDS023G
SN74CBT3384A	24	10-Bit FET Bus Switch		✔	✔	✔	✔	✔		SCDS004I
SN74CBTD3384	24	10-Bit FET Bus Switch With Level Shifting	✔	✔	✔	✔	✔	✔		SCDS025K
SN74CBTS3384	24	10-Bit FET Bus Switch With Schottky Diode Clamping		✔	✔	✔	✔			SCDS024G
SN74CBT3386	24	10-Bit FET Bus-Exchange Switch With Extended Voltage Range		✦		✦	✦			SCDS022F
SN74CBT3861	24	10-Bit FET Bus Switch		✔	✔	✔	✔	✔		SCDS061B
SN74CBTD3861	24	10-Bit FET Bus Switch With Level Shifting		✔	✔	✔	✔	✔		SCDS084A
SN74CBT6800	24	10-Bit FET Bus Switch With Precharged Outputs for Live Insertion		✔	✔	✔	✔			SCDS005K

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now ★ = See page 4–3.
✦ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	SOIC	QSOP	SSOP	TSSOP	TVSOP	SOT	
SN74CBT16209A	48	18-Bit FET Bus-Exchange Switch	★			✔	✔	✔		SCDS006K
SN74CBT16210	48	20-Bit FET Bus Switch With Flow-Through Pinout				✔	✔	✔		SCDS033C
SN74CBTD16210	48	20-Bit FET Bus Switch With Level Shifting				✔	✔	✔		SCDS049C
SN74CBT16211A	56	24-Bit FET Bus Switch				✔	✔	✔		SCDS028H
SN74CBTD16211	56	24-Bit FET Bus Switch With Level Shifting				✔	✔	✔		SCDS048C
SN74CBTH16211	56	24-Bit FET Bus Switch With Bus Hold				✔	✔	✔		SCDS062A
SN74CBTS16211	56	24-Bit FET Bus Switch With Schottky Diode Clamping				✔	✔	✔		SCDS050B
SN74CBT16212A	56	24-Bit FET Bus-Exchange Switch	✔			✔	✔	✔		SCDS007M
SN74CBTH16212	56	24-Bit FET Bus-Exchange Switch With Bus Hold				✔	✔	✔		Call
SN74CBTS16212	56	24-Bit FET Bus-Exchange Switch With Schottky Diode Clamping				✔	✔	✔		SCDS036B
SN74CBT16213	56	24-Bit FET Bus-Exchange Switch				✔	✔			SCDS026F
SN74CBTS16213	56	24-Bit FET Bus-Exchange Switch With Schottky Diode Clamping				✛	✛	✛		SCDS051N
SN74CBT16214	56	12-Bit 1-of-3 FET Multiplexer/Demultiplexer				✔	✔			SCDS008I
SN74CBT16232	56	16-Bit 1-of-2 Synchronous FET Multiplexer/Demultiplexer				✔	✔			SCDS009J
SN74CBT16233	56	16-Bit 1-of-2 FET Multiplexer/Demultiplexer				✔	✔	✔		SCDS010H
SN74CBTR16233	56	16-Bit 1-of-2 FET Multiplexer/Demultiplexer		✛		✛	✛			SCDS075A
SN74CBT16244	48	16-Bit FET Bus Switch	✔			✔	✔	✔		SCDS031G
SN74CBT16292	56	12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors				✔	✔	✔		SCDS053C
SN74CBT16390	56	16-Bit 1-of-2 FET Multiplexer/Demultiplexer				✔	✔	✔		SCDS035C
SN74CBT16861	48	20-Bit FET Bus Switch				✛	✛			SCDS068
SN74CBT162292	56	12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors				✔	✔	✔		SCDS052C
SN74CBT36800	80	32-Bit FET Bus Switch With Precharged Outputs						✛		SCDS093
SN74CBT34X245	80	32-Bit FET Bus Switch						✛		SCDS089

TEXAS
INSTRUMENTS

CBTLV
Low-Voltage
Crossbar Technology Logic

TI has developed the SN74CBTLV family of 3.3-V bus switches to complement its existing SN74CBT family of 5-V bus switches. TI was the first to offer these devices, designed for 3.3-V, in its continuing drive to provide low-voltage solutions.

CBTLV devices can be used in multiprocessor systems as fast bus connections, bus-exchange switches for crossbar systems, ping-pong memory connections, or bus-byte swapping. They also can be used to replace relays, improving connect/disconnect speed and eliminating relay-reliability problems. The CBTLV family, designed to operate at 3.3 V, furthers the goal of an integrated system operating with LVTTL voltages.

The CBTLV devices are available in industry-leading packaging options such as the shrink small-outline package (SSOP), thin small-outline package (TSSOP), and thin very small-outline package (TVSOP) for reduced board area.

See www.ti.com/sc/logic for the most current data sheets.

CBTLV

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74CBTLV1G125	5	Low-Voltage Single FET Bus Switch		✛				SCDS057B
SN74CBTLV3125	14	Low-Voltage Quad FET Bus Switch	✔			✔	✔	SCDS037C
SN74CBTLV3126	14	Low-Voltage Quad FET Bus Switch	✔			✔	✔	SCDS038C
SN74CBTLV3245A	20	Low-Voltage Octal FET Bus Switch	✔		✔	✔	✔	SCDS034G
SN74CBTLV3251	16	Low-Voltage 1-of-8 FET Multiplexer/Demultiplexer	✛			✛	✛	SCDS054C
SN74CBTLV3253	16	Low-Voltage Dual 1-of-4 FET Multiplexer/Demultiplexer	✛			✛	✛	SCDS039C
SN74CBTLV3257	16	Low-Voltage 4-Bit 1-of-2 FET Multiplexer/Demultiplexer	✛			✛	✛	SCDS040C
SN74CBTLV3383	24	Low-Voltage 10-Bit FET Bus-Exchange Switch	✔		✔	✔	✔	SCDS047C
SN74CBTLV3384	24	Low-Voltage 10-Bit FET Bus Switch	✔		✔	✔	✔	SCDS059B
SN74CBTLV3857	24	Low-Voltage 10-Bit FET Bus Switch With Internal Pulldown Resistors	✛		✛	✛	✛	SCDS085A
SN74CBTLV3861	24	Low-Voltage 10-Bit FET Bus Switch	✛		✛	✛		SCDS041C
SN74CBTLV16210	48	Low-Voltage 20-Bit FET Bus Switch			✔	✔	✔	SCDS042E
SN74CBTLV16211	56	Low-Voltage 24-Bit FET Bus Switch			✔	✔	✔	SCDS043E
SN74CBTLV16212	56	Low-Voltage 24-Bit FET Bus-Exchange Switch			✔	✔	✔	SCDS044D
SN74CBTLV16235	56	Low-Voltage 18-Bit 1-of-2 FET Multiplexer/Demultiplexer			✛	✛	✛	SCDS060C
SN74CBTLV16292	56	Low-Voltage 12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors			✔	✔	✔	SCDS055G
SN74CBTLV16800	48	Low-Voltage 20-Bit FET Bus Switch With Precharged Outputs			✔	✔	✔	SCDS045E
SN74CBTLV162292	56	Low-Voltage 12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors			✔	✔	✔	SCDS056C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

TEXAS
INSTRUMENTS

CD4000
CMOS B-Series
Integrated Circuits

The CD4000 family is a CMOS B series of devices with a maximum dc supply-voltage rating of 20 V. The family has an unusually large number of functions, including analog switches, monostable multivibrators, level converters, counters, timers, display drivers, phase-locked loops (PLLs), and other functions. The wide operating voltage range of this family allows the use of the CD4000 products in varied applications, including instrumentation, control, and communications.

Key features:

- Wide variety of functions
- High noise immunity
- Low power consumption
- Propagation delay time similar to LSTTL products
- 5-, 10-, and 15-V parametric ratings
- High fanout, typically 10
- Excellent temperature stability

TI's CD4000 products were acquired from Harris Semiconductor in December 1998.

See www.ti.com/sc/logic for the most current data sheets.

CD4000

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
CD4001B	14	Quad 2-Input NOR Gate	✔	✔	✔	SCHS015
CD4001UB	14	Quad 2-Input NOR Gate	✔	✔	✔	SCHS016
CD4002B	14	Dual 4-Input NOR Gate	✔	✔		SCHS015
CD4006B	14	18-Stage Static Shift Register	✔	✔		SCHS017
CD4007UB	14	Dual Complementary Pair Plus Inverter	✔	✔	✔	SCHS018
CD4009UB	16	Hex Buffer/Converter	✔	✔		SCHS020
CD4010B	16	Hex Buffer/Converter	✔	✔		SCHS020
CD4011B	14	Quad 2-Input NAND Gate	✔	✔	✔	SCHS021
CD4011UB	14	Quad 2-Input NAND Gate	✔	✔	✔	SCHS022
CD4012B	14	Dual 4-Input NAND Gate	✔	✔	✔	SCHS021
CD4013B	14	Dual D-Type Flip-Flop	✔	✔	✔	SCHS023
CD4014B	16	8-Stage Static Shift Register	✔	✔		SCHS024
CD4015B	16	Dual 4-Stage Static Shift Register	✔	✔		SCHS025
CD4016B	14	Quad Bilateral Switch	✔	✔	✔	SCHS026
CD4017B	16	Decade Counter/Divider	✔	✔		SCHS027
CD4018B	16	Presettable Divide-by-N Counter	✔	✔		SCHS028
CD4019B	16	Quad AND/OR Select Gate	✔	✔		SCHS029
CD4020B	16	Ripple-Carry Binary Counter/Divider	✔	✔		SCHS030
CD4021B	16	8-Stage Static Shift Register	✔	✔		SCHS024
CD4022B	16	Octal Counter/Divider	✔	✔		SCHS027
CD4023B	14	Triple 3-Input NAND Gate	✔	✔	✔	SCHS021
CD4024B	14	7-Stage Ripple-Carry Binary Counter/Divider	✔	✔	✔	SCHS030
CD4025B	14	Triple 3-Input NOR Gate	✔	✔	✔	SCHS015
CD4026B	16	Decade Counter/Divider	✔	✔		SCHS031
CD4027B	16	Dual J-K Master-Slave Flip-Flop		✔	✔	SCHS032
CD4028B	16	BCD-to-Decimal Decoder	✔	✔		SCHS033
CD4029B	16	Presettable Up/Down Counter	✔	✔		SCHS034
CD4030B	14	Quad Exclusive-OR Gate	✔	✔	✔	SCHS035
CD4031B	16	64-Stage Static Shift Register	✔	✔		SCHS036
CD4033B	16	Decade Counter/Divider		✔		SCHS031
CD4034B	24	8-Stage Static Bidirectional Parallel/Serial Input/Output Bus Register	✔	✔		SCHS037
CD4035B	16	4-Stage Parallel-In/Parallel-Out Shift Register	✔	✔		SCHS038
CD4040B	16	12-Stage Ripple-Carry Binary Counter/Divider	✔	✔		SCHS030
CD4041UB	14	Quad True/Complement Buffer	✔	✔		SCHS039
CD4042B	16	Quad Clocked D Latch	✔	✔	✔	SCHS040
CD4043B	16	Quad NOR R/S Latch With 3-State Outputs	✔	✔	✔	SCHS041
CD4044B	16	Quad NAND R/S Latch With 3-State Outputs	✔	✔	✔	SCHS041

commercial package description and availability

schedule

✔ = Now

✣ = Planned

See Appendix A for package information.

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
CD4045B	16	21-Stage Counter		✔		SCHS042
CD4046B	16	Micropower Phase-Locked Loop	✔	✔		SCHS043
CD4047B	14	Low-Power Monostable/Astable Multivibrator	✔	✔		SCHS044
CD4048B	16	Multifunction Expandable 8-Input Gate	✔	✔		SCHS045
CD4049UB	16	Hex Buffer/Converter	✔	✔	✔	SCHS046A
CD4050B	16	Hex Buffer/Converter	✔	✔	✔	SCHS046A
CD4051B	16	8-Channel Analog Multiplexer/Demultiplexer	✔	✔	✔	SCHS051B
CD4052B	16	4-Channel Analog Multiplexer/Demultiplexer	✔	✔		SCHS047B
CD4053B	16	2-Channel Analog Multiplexer/Demultiplexer	✔	✔		SCHS047B
CD4054B	16	4-Segment LCD Display Driver	✔	✔		SCHS048
CD4055B	16	BCD-to-7-Segment LCD Driver		✔		SCHS048
CD4056B	16	BCD-to-7-Segment LCD Driver	✔	✔		SCHS048
CD4059A	24	Programmable Divide-by-N Counter		✔		SCHS109
CD4060B	16	14-Stage Ripple-Carry Binary Counter/Divider and Oscillator	✔	✔		SCHS049
CD4063B	16	4-Bit Magnitude Comparator	✔	✔		SCHS050
CD4066B	14	Quad Bilateral Switch	✔	✔	✔	SCHS051
CD4067B	24	16-Channel Analog Multiplexer/Demultiplexer	✔	✔		SCHS052
CD4068B	14	8-Input NAND/AND Gate	✔	✔		SCHS053
CD4069UB	14	Hex Inverter	✔	✔	✔	SCHS054
CD4070B	14	Quad Exclusive-OR Gate	✔	✔	✔	SCHS055
CD4071B	14	Quad 2-Input OR Gate	✔	✔	✔	SCHS056
CD4072B	14	Dual 4-Input OR Gate	✔	✔		SCHS056
CD4073B	14	Triple 3-Input AND Gate	✔	✔	✔	SCHS057
CD4075B	14	Triple 3-Input OR Gate	✔	✔	✔	SCHS056
CD4076B	16	4-Bit D-Type Register	✔	✔		SCHS058
CD4077B	14	Quad Exclusive-NOR Gate	✔	✔	✔	SCHS055
CD4078B	14	8-Input NOR/OR Gate	✔	✔	✔	SCHS059
CD4081B	14	Quad 2-Input AND Gate	✔	✔	✔	SCHS057
CD4082B	14	Dual 4-Input AND Gate	✔	✔		SCHS057
CD4085B	14	Dual 2-Wide 2-Input AND-OR-INVERT Gate	✔	✔		SCHS060
CD4086B	14	Expandable 4-Wide 2-Input AND-OR-INVERT Gate	✔	✔		SCHS061
CD4089B	16	Binary Rate Multiplier	✔	✔		SCHS062
CD4093B	14	Quad 2-Input NAND Schmitt Trigger	✔	✔	✔	SCHS115
CD4094B	14	8-Stage Shift-and-Store Bus Register	✔	✔		SCHS063
CD4097B	24	8 Channel Analog Multiplexer/Demultiplexer	✔	✔		SCHS052
CD4098B	16	Dual Monostable Multivibrator	✔	✔		SCHS065
CD4099B	16	8-Bit Addressable Latch	✔	✔		SCHS066
CD4502B	16	Strobed Hex Inverter/Buffer	✔	✔		SCHS067
CD4503B	16	Hex Buffer With 3-State Outputs	✔	✔		SCHS068
CD4504B	16	Hex Voltage-Level Shifter for TTL-to-CMOS or CMOS-to-CMOS Operation	✔	✔		SCHS069
CD4508B	24	Dual 4-Bit Latch	✔	✔		SCHS070

TEXAS INSTRUMENTS

CD4000

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
CD4510B	16	Presettable BCD Up/Down Counter		✔		SCHS071
CD4511B	16	BCD-to-7-Segment Latch Decoder Driver	✔	✔		SCHS072
CD4512B	16	8-Channel Data Selector	✔	✔		SCHS073
CD4514B	24	4-Bit Latch/4-to-16 Line Decoder	✔	✔	✔	SCHS074
CD4515B	24	4-Bit Latch/4-to-16 Line Decoder	✔	✔	✔	SCHS074
CD4516B	16	Presettable Binary Up/Down Counter	✔	✔		SCHS071
CD4517B	16	Dual 64-Stage Static Shift Register	✔	✔		SCHS075
CD4518B	16	Dual BCD Up Counter	✔	✔		SCHS076
CD4520B	16	Dual Binary Up Counter	✔	✔		SCHS076
CD4521B	16	24-Stage Frequency Divider		✔		SCHS078
CD4522B	16	Programmable BCD Divide-by-N Counter		✔		SCHS079
CD4527B	16	BCD Rate Multiplier		✔		SCHS080
CD4532B	16	8-Bit Priority Encoder	✔	✔		SCHS082
CD4536B	16	Programmable Timer	✔	✔		SCHS083
CD4541B	14	Programmable Timer	✔	✔	✔	SCHS085
CD4543B	16	BCD-to-7-Segment Latch/Decoder/Driver for Liquid-Crystal Displays		✔		SCHS086
CD4555B	16	Dual Binary to 1-of-4 Decoder/Demultiplexer	✔	✔		SCHS087
CD4556B	16	Dual Binary to 1-of-4 Decoder/Demultiplexer	✔	✔		SCHS087
CD4572UB	16	Hex Gate (With Inverters, NOR Gates, and NAND Gates)		✔		SCHS090
CD4585B	16	4-Bit Magnitude Comparator	✔	✔		SCHS091
CD4724B	16	8-Bit Addressable Latch	✔	✔		SCHS092
CD14538B	16	Dual Precision Monostable Multivibrator	✔	✔		SCHS093
CD40102B	16	8-Stage Presettable Synchronous BCD Down Counter		✔		SCHS095
CD40103B	16	8-Stage Presettable Synchronous Down Counter	✔	✔		SCHS095
CD40105B	16	4-Bit-by-16-Word FIFO Register	✔	✔		SCHS096
CD40106B	14	Hex Schmitt Triggers	✔	✔	✔	SCHS097
CD40107B	8	Dual 2-Input NAND Buffer/Driver	✔	✔		SCHS098
CD40109B	16	Quad Low-to-High Voltage Level Shifter	✔	✔		SCHS099
CD40110B	16	Decade Up-Down Counter/Latch/Display Driver		✔		SCHS100
CD40117B	14	Programmable Dual 4-Bit Terminator		✔		SCHS101
CD40147B	16	10-Line to 4-Line BCD Priority Encoder		✔		SCHS102
CD40161B	16	Synchronous Programmable 4-Bit Counter	✔	✔		SCHS103
CD40174B	16	Hex D-Type Flip-Flop	✔	✔		SCHS104
CD40175B	16	Quad D-Type Flip-Flop	✔	✔		SCHS105
CD40192B	16	Presettable BCD Up/Down Counter	✔	✔		SCHS106
CD40193B	16	Presettable Binary Up/Down Counter	✔	✔		SCHS106
CD40194B	16	4-Bit Bidirectional Universal Shift Register		✔		SCHS107
CD40257B	16	Quad 2-Line-to-1-Line Data Selector/Multiplexer	✔	✔		SCHS108

Texas
INSTRUMENTS

74F
Fast Logic

74F logic is a general-purpose family of high-speed advanced bipolar logic. TI provides over 60 functions, including gates, buffers/drivers, bus transceivers, flip-flops, latches, counters, multiplexers, and demultiplexers in the 74F logic family.

See www.ti.com/sc/logic for the most current data sheets.

74F

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74F00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔		SDFS035A
SN74F02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔		SDFS036A
SN74F04	14	Hex Inverter	✔	✔	✔		SDFS037A
SN74F08	14	Quad 2-Input Positive-AND Gate		✔	✔		SDFS038A
SN74F10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔		SDFS039A
SN74F11	14	Triple 3-Input Positive-AND Gate	✔	✔	✔		SDFS040A
SN74F20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔		SDFS041A
SN74F21	14	Dual 4-Input Positive-AND Gate		✔	✔		SDFS006A
SN74F27	14	Triple 3-Input Positive-NOR Gate	✔	✔	✔		SDFS042A
SN74F30	14	8-Input Positive-NAND Gate	✔	✔	✔		SDFS043A
SN74F32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔		SDFS044A
SN74F38	14	Quad 2-Input Positive-NAND Gate		✔	✔		SDFS013A
SN74F74	14	Dual D-Type Flip-Flop	✔	✔	✔		SDFS046A
SN74F86	14	Quad 2-Input Exclusive-OR Gate		✔	✔		SDFS019B
SN74F109	16	Dual J-$\overline{\text{K}}$ Positive-Edge-Triggered Flip-Flop With Clear and Preset	✔	✔	✔		SDFS047A
SN74F112	14	Dual J-K Negative-Edge-Triggered Flip-Flop With Clear and Preset		✔	✔		SDFS048A
SN74F125	14	Quad Bus Buffer Gate ($\overline{\text{OE}}$)		✔	✔		SDFS016A
SN74F126	14	Quad Bus Buffer Gate (OE)		✔	✔		SDFS017A
SN74F138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔		SDFS051B
SN74F151B	16	8-to-1 Data Selector/Multiplexer		✔	✔		SDFS023A
SN74F153	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔		SDFS052A
SN74F157A	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔		SDFS053A
SN74F158A	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔		SDFS054A
SN74F161A	16	4-Bit Synchronous Binary Counter		✔	✔		SDFS056A
SN74F163A	16	4-Bit Synchronous Binary Counter		✔	✔		SDFS088
SN74F169	16	4-Bit Synchronous Up/Down Binary Counter		✔	✔		SDFS089
SN74F174A	16	Hex D-Type Flip-Flop With Clear		✔	✔		SDFS029B
SN74F175	16	Quad D-Type Flip-Flop With Clear		✔	✔		SDFS058A
SN74F240	20	Octal Buffer/Driver	✔	✔	✔	✔	SDFS061A
SN74F241	20	Octal Buffer/Driver	✔	✔	✔		SDFS090

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

![Texas Instruments logo]

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74F244	20	Octal Buffer/Driver	✔	✔	✔	✔	SDFS063A
SN74F245	20	Octal Bus Transceiver	✔	✔	✔	✔	SDFS010A
SN74F251B	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔		SDFS066A
SN74F253	16	Dual 4-to-1 Data Selector/Multiplexer		✔	✔		SDFS064A
SN74F257	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔		SDFS065A
SN74F258	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔		SDFS067A
SN74F260	14	Dual 5-Input Positive-NOR Gate		✔	✔		SDFS012A
SN74F280B	14	9-Bit Parity Generator/Checker		✔	✔		SDFS008A
SN74F283	16	4-Bit Binary Full Adder With Fast Carry	✔	✔	✔		SDFS069A
SN74F299	20	8-Bit Universal Shift/Storage Register		✔	✔		SDFS071A
SN74F373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	SDFS076A
SN74F374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	SDFS077A
SN74F377A	20	Octal D-Type Flip-Flop With Clock Enable		✔	✔		SDFS018D
SN74F520	20	8-Bit Identity Comparator		✔	✔		SDFS081A
SN74F521	20	8-Bit Identity Comparator	✔	✔	✔		SDFS091
SN74F541	20	Octal Buffer/Driver	✔	✔	✔		SDFS021A
SN74F543	24	Octal Registered Bus Transceiver		✔	✔	✔	SDFS025B
SN74F573	20	Octal D-Type Transparent Latch		✔	✔		SDFS011A
SN74F574	20	Octal D-Type Flip-Flop		✔	✔		SDFS005A
SN74F623	20	Octal Bus Transceiver	✔	✔	✔		SDFS087
SN74F657	24	Octal Transceiver With Parity Generator/Checker		✔	✔		SDFS027A
SN74F2244	20	Octal Buffer/Driver With Damping Resistors		✔	✔	✔	SDFS095B
SN74F2245	20	Octal Bus Transceiver With Damping Resistors		✔	✔	✔	SDFS099
SN74F2373	20	Octal D-Type Transparent Latch With Damping Resistors		✔	✔	✔	SDFS100

TEXAS INSTRUMENTS

FCT
Fast CMOS TTL Logic

The FCT product family is designed for use in high-current-drive bus-interface applications. The FCT family is fabricated using a CMOS 6-μm technology to provide up to 40-mA or 64-mA current sink capability with typical propagation delays of 5 ns (CD74FCT245). The family is optimized to operate at 5 V and is pin-function compatible with most standard bipolar and CMOS logic families.

The FCT family of devices has several features for efficient bus interfacing. The family does not have input or output diodes to V_{CC} and most FCT devices have 3-state outputs. Bus noise is minimized with 1 V or less typical ground bounce (V_{olp}, 5-V V_{CC}, 25$°$C) and limited output voltage swing, 3.5-V typical.

The FCT family includes 8-, 9-, and 10-bit bus-interface devices.

Key features:

- 5-V operation
- 5-ns typical propagation delay (CD74FCT245)
- Low quiescent power consumption
- 1-V typical V_{olp}

TI's FCT family was acquired from Harris Semiconductor in December 1998.

See www.ti.com/sc/logic for the most current data sheets.

FCT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
CD74FCT244	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔	✔	SCHS253
CD74FCT244AT	20	Octal Buffer/Line Driver With 3-State Outputs		✔			SCHS253
CD74FCT245	20	Octal Bus TransceiversWith 3-State Outputs	✔	✔	✔	✔	SCHS253
CD74FCT273	20	Octal D Flip-Flop With Reset		✔	✔		SCHS271
CD74FCT373	20	Octal Transparent Latch With 3-State Outputs		✔	✔	✔	SCHS254
CD74FCT374	20	Octal D-Type Flip-Flop With 3-State Outputs		✔	✔	✔	SCHS255
CD74FCT540	20	Octal Buffer/Line Driver With 3-State Outputs		✔	✔		SCHS256
CD74FCT541	20	Octal Buffer/Line Driver With 3-State Outputs		✔	✔	✔	SCHS257
CD74FCT543	24	Octal Register/Transceiver With 3-State Outputs		✔	✔	✔	SCHS257
CD74FCT564	20	Octal D-Type Flip-Flop With 3-State Outputs		✔	✔		SCHS258
CD74FCT573	20	Transparent Latch With 3-State Outputs		✔	✔	✔	SCHS259
CD74FCT573AT	20	Transparent Latch With 3-State Outputs		✔			SCHS260A
CD74FCT574	20	Octal D-Type Flip-Flop With 3-State Outputs		✔	✔	✔	SCHS260A
CD74FCT623	20	Octal Bus Transceiver With 3-State Outputs			✔		SCHS259
CD74FCT646	24	Octal Bus Transceiver With 3-State Outputs		✔	✔	✔	SCHS296
CD74FCT651	24	Octal Transceiver/Register With 3-State Outputs		✔	✔		SCHS261
CD74FCT652	24	Octal Bus Transceiver/Register With 3-State Outputs		✔	✔		SCHS262
CD74FCT653	24	Octal Bus Transceiver/Register With 3-State Outputs		✔	✔		SCHS262
CD74FCT654	24	Octal Bus Transceiver/Register With A-Side Open-Drain and B-Side 3-State Outputs		✔			SCHS263
CD74FCT821A	24	10-Bit D-Type Flip-Flop With 3-State Outputs		✔	✔		SCHS263
CD74FCT822A	24	10-Bit D-Type Flip-Flop With 3-State Outputs		✔			SCHS264
CD74FCT823A	24	9-Bit D-Type Flip-Flop With 3-State Outputs		✔			SCHS264
CD74FCT824A	24	9-Bit D-Type Flip-Flop With 3-State Outputs		✔			SCHS265
CD74FCT841A	24	10-Bit Transparent Latch With 3-State Outputs		✔	✔		SCHS265
CD74FCT842A	24	10-Bit Transparent Latch With 3-State Outputs			✔		SCHS266
CD74FCT843A	24	9-Bit Transparent Latch With 3-State Outputs			✔		SCHS266
CD74FCT844A	24	9-Bit Transparent Latch With 3-State Outputs			✔		SCHS267
CD74FCT861A	24	10-Bit Bus Transceiver With 3-State Outputs		✔			SCHS268
CD74FCT863A	24	9-Bit Bus Transceiver With 3-State Outputs			✔		SCHS269
CD74FCT2952A	24	Octal Bus Transceiver/Register With 3-State Outputs			✔		SCHS295

commercial package description and availability

schedule

✔ = Now
✛ = Planned

See Appendix A for package information.

TEXAS INSTRUMENTS

FIFO
First-In, First-Out Memories

TI has an extended product offering of Advanced CMOS (ACT), Advanced BiCMOS (ABT), and Advanced Low-Voltage CMOS (ALVC) FIFOs. The FIFO product family includes synchronous unidirectional and bidirectional FIFOs offered in 64-bit to 2K memory depths and 1-bit to 36-bit widths.

TI's application-specific FIFOs are specially designed for use in telecommunications, DSP, internetworking systems, and high-bandwidth computing. These devices include features such as parity generate and check, retransmit, bus matching, byte swapping, bypass mode, and microprocessor-like control interface.

Application-specific FIFOs, in addition to TI's Widebus™ FIFO products, offer space-saving surface-mount packaging and multiple-speed sorts for ease of design.

For the latest information on future TI FIFO releases, data sheets, and application reports, please visit http://www.ti.com/sc/docs/asl/families/fifo.htm.

DEVICE SELECTION GUIDE

FIFO

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	PLCC	QFP	TQFP	
36-Bit Synchronous FIFOs										
SN74ABT3611	132, 120	64 × 36 Synchronous FIFO						✔	✔	SCBS127E
SN74ABT3612	132, 120	64 × 36 × 2 Synchronous Bidirectional FIFO						✔	✔	SCBS129G
SN74ABT3613	132, 120	64 × 36 Synchronous FIFO						✔	✔	SCBS128F
SN74ABT3614	132, 120	64 × 36 × 2 Synchronous Bidirectional FIFO	✔					✔	✔	SCBS126G
SN74ACT3622	132, 120	256 × 36 × 2 Synchronous Bidirectional FIFO						✔	✔	SCAS247D
SN74ACT3631	132, 120	512 × 36 Synchronous FIFO						✔	✔	SCAS246G
SN74ACT3632	132, 120	512 × 36 × 2 Synchronous Bidirectional FIFO	✔					✔	✔	SCAS224D
SN74ACT3641	132, 120	1K × 36 Synchronous FIFO	✔					✔	✔	SCAS338C
SN74ACT3651	132, 120	2K × 36 Synchronous FIFO						✔	✔	SCAS439D
SN74ALVC3651	132, 120	3.3-V 2K × 36 Synchronous FIFO						✦	✦	Call
18-Bit Asynchronous FIFOs										
SN74ACT7814	56	64 × 18 Asynchronous FIFO				✔				SCAS209C
SN74ACT7806	56	256 × 18 Asynchronous FIFO				✔				SCAS438C
SN74ACT7804	56	512 × 18 Asynchronous FIFO				✔				SCAS204C
SN74ABT7820	80, 80	512 × 18 × 2 Asynchronous Bidirectional FIFO						✔	✔	SCAS206D
SN74ACT7802	68, 80	1K × 18 Asynchronous FIFO					✔		✔	SCAS187D
SN74ALVC7814	56	3.3-V 64 × 18 Asynchronous FIFO				✔				SCAS592A
SN74ALVC7806	56	3.3-V 256 × 18 Asynchronous FIFO				✔				SCAS591A
SN74ALVC7804	56	3.3-V 512 × 18 Asynchronous FIFO				✔				SCAS437E
18-Bit Synchronous FIFOs										
SN74ACT7813	56	64 × 18 Synchronous FIFO				✔				SCAS199B
SN74ACT7805	56	256 × 18 Synchronous FIFO				✔				SCAS201B
SN74ACT7803	56	512 × 18 Synchronous FIFO				✔				SCAS191C
SN74ABT7819	80, 80	512 × 18 × 2 Synchronous Bidirectional FIFO						✔	✔	SCBS125G
SN74ACT7811	68, 80	1K × 18 Synchronous FIFO					✔		✔	SCAS151C
SN74ACT7881	68, 80	1K × 18 Synchronous FIFO	✔				✔		✔	SCAS227E

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✦ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	PLCC	QFP	TQFP	
SN74ALVC7805	56	3.3-V 256 × 18 Synchronous FIFO				✔				SCAS593A
SN74ALVC7803	56	3.3-V 512 × 18 Synchronous FIFO				✔				SDAS436D
SN74ACT7882	68, 80	2K × 18 Synchronous FIFO					✔		✔	SCAS445C
SN74ALVC7813	56	3.3-V 64 × 18 Synchronous FIFO				✔				SCAS594A
9-Bit FIFOs										
SN74ACT2235	44, 64	1K × 9 × 2 Asynchronous Bidirectional FIFO					✔		✔	SCAS148E
SN74ACT7807	44, 64	2K × 9 Synchronous FIFO					✔		✔	SCAS200D
SN74ACT7808	44, 64	2K × 9 Asynchronous FIFO					✔		✔	SCAS205D
1-Bit Telecom FIFOs										
SN74ACT2226	24	64 × 1 Synchronous FIFO			✔					SCAS219C
SN74ACT2227	28	64 × 1 Synchronous FIFO			✔					SCAS220C
SN74ACT2228	24	256 × 1 Synchronous FIFO			✔					SCAS219C
SN74ACT2229	28	256 × 1 Synchronous FIFO			✔					SCAS220C
Various-Width FIFOs										
SN74ACT3638	132, 120	512 × 32 × 2 Synchronous Bidirectional FIFO						✔	✔	SCAS228D
SN74ALS232B	16, 16, 20	16 × 4 Asynchronous FIFO, 40 MHz		✔	✔		✔			SCAS251B
SN74LS224A	16	16 × 4 Synchronous FIFO, 10 MHz	✔	✔						SDLS023B
SN74ALS236	16, 20	64 × 4 Asynchronous FIFO, 30 MHz		✔	✔		✔			SDAS107C
SN74S225	20	16 × 5 Asynchronous FIFO, 10 MHz		✔						SDLS207B
SN74ALS233B	20	16 × 5 Asynchronous FIFO, 40 MHz		✔	✔		✔			SCAS253B
CD74HC40105	16	4-Bit by 16-Word FIFO Register	✔	✔	✔					SCHS222

TEXAS INSTRUMENTS

GTL
Gunning-Transceiver Logic

GTL is a reduced-voltage switching standard that provides high-speed, point-to-point, and backplane communications with low power dissipation. TI offers TTL/LVTTL-to-GTL/GTL+ translators to interface with TTL/LVTTL-based subsystems. This enables designers to use GTL or higher switching standards for speed-sensitive subsystems and to use TTL/LVTTL to interface with the rest of the system.

Performance characteristics of the GTL family are:

- Specified for GTL and the higher noise margin GTL+ (GTLP) switching standards
- 5-V tolerant TTL/LVTTL I/Os (except 'GTL1655) – Capability to interface with a mixed-voltage environment. The I/Os can handle up to 7 V, which allows them to act as 5-V TTL-to-GTL/GTL+, as well as 3-V LVTTL-to-GTL/GTL+ translators.
- Speed – Provides high performance with maximum propagation delays of between 3.8 ns and 5.9 ns.
- Drive – Provides options for both medium drive (40–50 mA) and high drive (100 mA) on the GTL/GTL+ port to allow the designer to select the optimum device for point-to-point use through heavily loaded backplane applications.

Additional features include:

- Live insertion – GTL devices incorporate I_{off} (both ports) and power-up 3-state (PU3S) circuitry (GTL/GTL+ port). I_{off} prevents the device from being damaged during partial power down, and PU3S forces the outputs to the high-impedance state during power up and power down to prevent driver conflict. Additionally, the 'GTL1655 incorporates PU3S on the TTL/LVTTL port and internal I/O precharging (BIAS V_{CC}) circuitry on the GTL/GTL+ port for applications that must prevent bus glitching on insertion.
- Bus hold – Eliminates floating inputs on the TTL/LVTTL port by holding them at the last valid logic state. This eliminates the need for external pullup and pulldown resistors on unused/undriven inputs, which reduces power, cost, and board-layout time.
- Output edge-rate control (OEC™) is offered on the GTL/GTL+ outputs to reduce line reflections and improve overall signal integrity.
- Packaging – GTL devices are available in the shrink small-outline package (SSOP) ('GTL16612 and 'GTL16616 only) and thin shrink small-outline package (TSSOP) for higher performance and reduced board space.

See www.ti.com/sc/logic for the most current data sheets.

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	SSOP	TSSOP	
SN74GTL1655	64	16-Bit LVTTL-to-GTL/GTL+ Universal Bus Transceiver With Live Insertion			✔	SCBS696D
SN74GTL16612	56	18-Bit LVTTL-TO-GTL/GTL+ Universal Bus Transceiver	✔	✔	✔	SCBS480H
SN74GTL16612A	56	18-Bit LVTTL-TO-GTL/GTL+ Universal Bus Transceiver		✛	✛	SCES187A
SN74GTL16616	56	17-Bit LVTTL-TO-GTL/GTL+ Universal Bus Transceiver With Buffered Clock Outputs	✛	✔	✔	SCBS481E
SN74GTL16622A	64	18-Bit LVTTL-to-GTL/GTL+ Registered Bus Transceiver			✔	SCBS673B
SN74GTL16923	64	18-Bit LVTTL-to-GTL/GTL+ Registered Bus Transceiver			✔	SCBS674D

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule
✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

TEXAS INSTRUMENTS

HC/HCT
High-Speed CMOS Logic

TI offers a full family of HC/HCT devices for low-power, medium- to low-speed applications. The recent addition of products acquired from Harris Semiconductor has added a wide range of additional functions. Over 250 HC and HCT device types are available, including gates, latches, flip-flops, buffers/drivers, counters, multiplexers, transceivers, and registered transceivers.

The HC family offers CMOS-compatible inputs, and the HCT family offers TTL-compatible inputs.

See www.ti.com/sc/logic for the most current data sheets.

HC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HC00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔			SCHS116
SN74HC00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	✔	✔	SCLS181B
CD74HC02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔			SCHS125
SN74HC02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔	✔	✔	SCLS076B
CD74HC03	14	Quad 2-Input Positive-NAND Gate With Open-Drain Outputs	✔	✔	✔			SCHS126
SN74HC03	14	Quad 2-Input Positive-NAND Gate With Open-Drain Outputs	✔	✔	✔			SCLS077B
CD74HC04	14	Hex Inverter	✔	✔	✔			SCHS117
SN74HC04	14	Hex Inverter	✔	✔	✔	✔	✔	SCLS078B
CD74HCU04	14	Unbuffered Hex Inverter		✔	✔			SCHS127
SN74HCU04	14	Unbuffered Hex Inverter	✔	✔	✔			SCLS079B
SN74HC05	14	Hex Inverter With Open-Drain Outputs	✔	✔	✔	✔	✔	SCLS080B
CD74HC08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔			SCHS118
SN74HC08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔	✔	✔	SCLS081B
CD74HC10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔			SCHS128
SN74HC10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔			SCLS083B
CD74HC11	14	Triple 3-Input Positive-AND Gate	✔	✔	✔			SCHS273
SN74HC11	14	Triple 3-Input Positive-AND Gate	✔	✔	✔			SCLS084B
CD74HC14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔			SCHS129
SN74HC14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔	✔	SCLS085B
CD74HC20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔			SCHS130
SN74HC20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔			SCLS086C
CD74HC21	14	Dual 4-Input Positive-AND Gate	✔	✔	✔			SCHS131
SN74HC21	14	Dual 4-Input Positive-AND Gate	✔	✔	✔			SCLS087C
CD74HC27	14	Triple 3-Input Positive-NOR Gate		✔	✔			SCHS132
SN74HC27	14	Triple 3-Input Positive-NOR Gates	✔	✔	✔			SCLS088B
CD74HC30	14	8-Input NAND Gate	✔	✔	✔			SCHS121
CD74HC32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔			SCHS274
SN74HC32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔	✔	✔	SCLS200B
CD74HC42	16	4-to-10 BCD-to-Decimal Decoder	✔	✔	✔			SCHS133
SN74HC42	16	4-to-10 BCD-to-Decimal Decoder	✔	✔	✔			SCLS091B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

See Appendix A for package information on CD54/74HC devices.

schedule
✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HC73	14	Dual J-K Flip-Flop With Reset	✔	✔	✔			SCHS134
CD74HC74	14	Dual D-Type Flip-Flop With Set and Reset	✔	✔	✔			SCHS124
SN74HC74	14	Dual D-Type Flip-Flop With Set and Reset	✔	✔	✔	✔	✔	SCLS094B
CD74HC75	16	Dual 2-Bit Bistable Transparent Latch	✔	✔	✔			SCHS135
CD74HC85	16	4-Bit Magnitude Comparator	✔	✔	✔			SCHS136
CD74HC86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔			SCHS137
SN74HC86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔	✔		SCLS100B
CD74HC93	14	4-Bit Binary Ripple Counter		✔	✔			SCHS138
CD74HC107	14	Dual J-K Flip-Flop With Reset	✔	✔	✔			SCHS139
CD74HC109	16	Dual J-K Flip-Flop With Set and Reset	✔	✔	✔			SCHS140
SN74HC109	16	Dual J-K Positive-Edge-Triggered Flip-Flop With Clear and Preset	✔	✔	✔			SCLS098
CD74HC112	16	Dual J-K Flip-Flop With Set and Reset	✔	✔	✔			SCHS141
SN74HC112	16	Dual J-K Negative-Edge-Triggered Flip-Flop	✔	✔	✔			SCLS099C
CD74HC123	16	Dual Retriggerable Monostable Multivibrator With Reset	✔	✔	✔			SCHS142
CD74HC125	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔			SCHS143
SN74HC125	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔	✔	✔	SCLS104B
CD74HC126	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔			SCHS144
SN74HC126	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔	✔	✔	SCLS103C
CD74HC132	14	Quad 2-Input NAND Gate With Schmitt-Trigger Inputs	✔	✔	✔			SCHS145
SN74HC132	14	Quad 2-Input Positive-NAND Gate With Schmitt-Trigger Inputs	✔	✔	✔	✔	✔	SCLS034C
CD74HC137	16	3-to-8 Line Decoder/Demutiplexer With Address Latches		✔				SCHS146
CD74HC138	16	3-to-8 Line Decoder/Demultiplexer	✔	✔	✔	✔		SCHS147A
SN74HC138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔	✔	✔	SCLS107C
CD74HC139	16	Dual 2-to-4 Line Decoder/Demultiplexer	✔	✔	✔			SCHS148
SN74HC139	16	Dual 2-to-4 Line Decoder/Demultiplexer	✔	✔	✔	✔	✔	SCLS108B
CD74HC147	16	10-to-4 Line Priority Encoder	✔	✔	✔			SCHS149
SN74HC148	16	8-to-3 Line Priority Encoder	✔	✔	✔			SCLS109D
CD74HC151	16	8-Input Multiplexer	✔	✔	✔			SCHS150
SN74HC151	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔	✔		SCLS110C
CD74HC153	16	Dual 4-Input Multiplexer	✔	✔	✔			SCHS151
SN74HC153	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔		✔	SCLS112B
CD74HC154	24	4-to-16 Line Decoder/Demultiplexer	✔	✔	✔			SCHS152
CD74HC157	16	Quad 2-Input Multiplexer	✔	✔	✔	✔		SCHS153
SN74HC157	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔			SCLS113B
CD74HC158	16	Quad 2-Input Multiplexer	✔	✔	✔			SCHS153
CD74HC161	16	4-Bit Presettable Binary Counter	✔	✔	✔			SCHS154
SN74HC161	16	4-Bit Synchronous Binary Counter	✔	✔	✔			SCLS297A
CD74HC163	16	4-Bit Presettable Binary Counter	✔	✔	✔			SCHS154

TEXAS INSTRUMENTS

HC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74HC163	16	4-Bit Synchronous Binary Counter	✔	✔	✔			SCLS298A
CD74HC164	14	8-Bit Serial-In/Parallel-Out Shift Register	✔	✔	✔			SCHS155
SN74HC164	14/16	8-Bit Parallel-Out Serial Shift Register	✔	✔	✔			SCLS115B
CD74HC165	16	8-Bit Parallel-In/Serial-Out Shift Register	✔	✔	✔			SCHS156
CD74HC166	16	8-Bit Parallel-In/Serial-Out Shift Register	✔	✔	✔			SCHS157
SN74HC166	16	8-Bit Parallel-Load Shift Register	✔	✔	✔			SCLS117B
CD74HC173	16	Quad D-Type Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS158
CD74HC174	16	Hex D-Type Flip-Flop With Reset	✔	✔	✔			SCHS159
SN74HC174	16	Hex D-Type Flip-Flop	✔	✔	✔			SCLS119B
CD74HC175	16	Quad D-Type Flip-Flop With Reset	✔	✔	✔			SCHS160
SN74HC175	16	Quad D-Type Flip-Flop With Clear	✔	✔	✔		✔	SCLS299A
CD74HC190	16	Presettable Synchronous BCD Decade Up/Down Counter	✔	✔				SCHS275
CD74HC191	16	Presettable Synchronous Binary 4-Bit Up/Down Counter	✔	✔	✔			SCHS162
SN74HC191	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔			SCLS121B
CD74HC192	16	Presettable Synchronous BCD Decade Up/Down Counter	✔	✔				SCHS163
CD74HC193	16	Presettable Synchronous 4-Bit Binary Up/Down Counter	✔	✔	✔			SCHS163
SN74HC193	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔			SCLS122B
CD74HC194	16	4-Bit Bidirectional Universal Shift Register	✔	✔	✔			SCHS164
CD74HC195	16	4-Bit Parallel Access Register	✔	✔	✔			SCHS165
CD74HC221	16	Dual Monostable Multivibrator With Reset	✔	✔	✔			SCHS166A
CD74HC237	16	3-to-8 Line Decoder/Demutiplexer With Address Latches	✔	✔	✔			SCHS146
CD74HC238	16	3-to-8 Line Decoder/Demultiplexer	✔	✔	✔			SCHS147A
CD74HC240	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS167
SN74HC240	20	Octal Buffer/Driver	✔	✔	✔	✔		SCLS128B
CD74HC241	20	Octal Buffer/Line Driver With 3-State Outputs		✔	✔			SCHS167
SN74HC241	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	SCLS300A
CD74HC243	14	Quad Bus Transceiver With 3-State Outputs	✔	✔	✔			SCHS168
CD74HC244	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS167
SN74HC244	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	SCLS130B
CD74HC245	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔			SCHS119
SN74HC245	20	Octal Bus Transceiver	✔	✔	✔	✔	✔	SCLS131B
CD74HC251	16	8-Input Multiplexer With 3-State Outputs	✔	✔	✔			SCHS169
SN74HC251	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔			SCLS132C
CD74HC253	16	Dual 4-Input Multiplexer		✔	✔			SCHS170
SN74HC253	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔			SCLS133B
CD74HC257	16	Quad 2-Input Multiplexer With 3-State Outputs	✔	✔	✔			SCHS171
CD74HC258	16	Quad 2-Input Multiplexer With Inverting 3-State Outputs			✔			SCHS276
CD74HC259	16	8-Bit Addressable Latch	✔	✔	✔			SCHS173

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74HC259	16	8-Bit Addressable Latch	✔	✔	✔	✔	✔	SCLS134B
SN74HC266	14	Quad 2-Input Exclusive-NOR Gate With Open-Drain Outputs		✔	✔			SCLS135C
CD74HC273	20	Octal D-Type Flip-Flop With Reset	✔	✔	✔			SCHS174
SN74HC273	20	Octal D-Type Flip-Flop With Clear	✔	✔	✔	✔	✔	SCLS136B
CD74HC280	14	9-Bit Odd/Even Parity Generator/Checker	✔	✔	✔			SCHS175
CD74HC283	16	High-Speed CMOS Logic 4-Bit Binary Full Adder	✔	✔	✔			SCHS176
CD74HC297	16	Digital Phase-Locked Loop	✔	✔				SCHS177
CD74HC299	20	8-Bit Universal Shift Register With 3-State Outputs	✔	✔	✔			SCHS178
CD74HC354	20	8-Input Multiplexer/Register With 3-State Outputs	✔	✔				SCHS179
CD74HC365	16	Hex Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS180
SN74HC365	16	Hex Buffer/Driver	✔	✔	✔			SCLS308B
CD74HC366	16	Hex Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS180
CD74HC367	16	Hex Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS181
SN74HC367	16	Hex Buffer/Driver	✔	✔	✔			SCLS309B
CD74HC368	16	Hex Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS181
SN74HC368	16	Hex Buffer/Driver	✔	✔	✔			SCLS310A
CD74HC373	20	Octal Transparent Latch With 3-State Outputs	✔	✔	✔			SCHS182
SN74HC373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	SCLS140B
CD74HC374	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS183
SN74HC374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	✔	SCLS141C
CD74HC377	20	Octal D-Type Flip-Flop With Data Enable		✔	✔			SCHS184
SN74HC377	20	Octal D-Type Flip-Flop With Clock Enable	✔	✔	✔			SCLS307A
CD74HC390	16	Dual Decade Ripple Counter		✔	✔			SCHS185
CD74HC393	14	Dual 4-Stage Binary Counter	✔	✔	✔			SCHS186
SN74HC393	14	Dual 4-Bit Binary Counter	✔	✔	✔	✔		SCLS143B
CD74HC423	16	Dual Retriggerable Monostable Multivibrator With Resets		✔	✔			SCHS142
CD74HC533	20	Octal Transparent Latch With 3-State Outputs	✔	✔				SCHS187
CD74HC534	20	Octal D-Type Inverting Flip-Flop With 3-State Outputs	✔	✔				SCHS188
CD74HC540	20	Octal Buffer and Line Driver With 3-State Outputs	✔	✔	✔			SCHS189
SN74HC540	20	Octal Buffer/Driver	✔	✔	✔			SCLS007B
CD74HC541	20	Octal Buffer and Line Driver With 3-State Outputs	✔	✔	✔	✔		SCHS189
SN74HC541	20	Octal Buffer/Driver	✔	✔	✔	✔	✔	SCLS305A
CD74HC563	20	Octal Transparent Latch With 3-State Outputs	✔	✔	✔			SCHS187
SN74HC563	20	Octal D-Type Transparent Latch	✔	✔	✔			SCLS145B
CD74HC564	20	Octal D-Type Inverting Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS188
CD74HC573	20	Octal Transparent Latch With 3-State Outputs	✔	✔	✔			SCHS182
SN74HC573A	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	SCLS147B
CD74HC574	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS183

TEXAS INSTRUMENTS

HC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74HC574	20	Octal D-Type Flip-Flop	✔	✔	✔		✔	SCLS148C
SN74HC590A	16	8-Bit Binary Counter	✔	✔	✔			SCLS039C
SN74HC594	16	8-Bit Shift Register		✔	✔	✔		SCLS040C
SN74HC595	16	8-Bit Shift Register	✔	✔	✔	✔		SCLS041B
CD74HC597	16	8-Bit Shift Register With Input Storage	✔	✔	✔			SCHS191
SN74HC623	20	Octal Bus Transceiver		✔	✔			SCLS149B
CD74HC640	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔			SCHS192
SN74HC640	20	Octal Bus Transceiver	✔	✔	✔			SCLS303A
SN74HC645	20	Octal Bus Transceiver	✔	✔	✔			SCLS304A
CD74HC646	24	Octal Bus Transceiver/Register With 3-State Outputs	✔	✔	✔			SCHS193
SN74HC646	24	Octal Registered Bus Transceiver		✔	✔			SCLS150B
CD74HC652	24	Octal Bus Transceiver/Register With 3-State Outputs		✔				SCHS194
SN74HC652	24	Octal Registered Bus Transceiver		✔	✔			SCLS151B
CD74HC670	16	4-by-4 Register File	✔	✔	✔			SCHS195
SN74HC682	20	8-Bit Magnitude Comparator		✔	✔			SCLS018C
SN74HC684	20	8-Bit Magnitude Comparator		✔	✔			SCLS340A
CD74HC688	20	8-Bit Magnitude Comparator	✔	✔	✔			SCHS196
SN74HC688	20	8-Bit Magnitude Comparator	✔	✔	✔	✔	✔	SCLS010B
CD74HC4002	14	Dual 4-Input NOR Gate	✔	✔	✔			SCHS197
CD74HC4015	16	Dual 4-Stage Static Shift Register	✔	✔	✔			SCHS198
CD74HC4016	14	Quad Bilateral Switch		✔	✔			SCHS199
CD74HC4017	16	Decade Counter/Divider	✔	✔	✔			SCHS200
CD74HC4020	16	14-Stage Binary Counter	✔	✔	✔			SCHS201
SN74HC4020	16	14-Bit Asynchronous Binary Counter	✔	✔	✔			SCLS158B
CD74HC4024	14	7-Stage Binary Ripple Counter	✔	✔	✔			SCHS202
CD74HC4040	16	12-Stage Binary Counter	✔	✔	✔			SCHS203
SN74HC4040	16	12-Bit Asynchronous Binary Counter	✔	✔	✔	✔	✔	SCLS160B
CD74HC4046A	16	Phase-Locked Loop With VCO	✔	✔	✔			SCHS204
CD74HC4049	16	Hex Buffer	✔	✔	✔			SCHS205
CD74HC4050	16	Hex Buffer	✔	✔	✔			SCHS205
CD74HC4051	16	Analog Multiplexer/Demultiplexer	✔	✔	✔			SCHS122A
CD74HC4052	16	Analog Multiplexer/Demultiplexer	✔	✔	✔	✔		SCHS122A
CD74HC4053	16	Analog Multiplexer/Demultiplexer	✔	✔	✔			SCHS122A
CD74HC4059	24	CMOS Programmable Divide-by-N Counter	✔	✔	✔			SCHS206
CD74HC4060	16	14-Stage Binary Counter With Oscillator	✔	✔	✔			SCHS207
SN74HC4060	16	14-Bit Asynchronous Binary Counter/Oscillator		✔	✔			SCLS161B
CD74HC4066	14	Quad Bilateral Switch	✔	✔	✔			SCHS208
SN74HC4066	14	Quad Bilateral Analog Switch		✔	✔	✔	✔	SCLS325B

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HC4067	24	16-Channel Analog Multiplexer/Demultiplexer		✔	✔			SCHS209
CD74HC4075	14	Triple 3-Input OR Gate	✔	✔	✔			SCHS210
CD74HC4094	16	8-Stage Shift-and-Store Bus Register With 3-Stage Outputs	✔	✔	✔			SCHS211
CD74HC4316	16	Quad Analog Switch With Level Translation	✔	✔	✔			SCHS212
CD74HC4351	20	Analog Multiplexer/Demultiplexer With Latches	✔	✔	✔			SCHS213
CD74HC4352	20	Analog Multiplexer/Demultiplexer With Latches		✔				SCHS213
CD74HC4511	16	BCD-to-7-Segment Latch/Decoder/Driver	✔	✔	✔			SCHS214
CD74HC4514	24	4-to-16 Line Decoder/Demultiplexer With Input Latches	✔	✔	✔			SCHS215
CD74HC4515	24	4-to-16 Line Decoder/Demultiplexer With Input Latches		✔	✔			SCHS215
CD74HC4518	16	Dual BCD Up Counter		✔				SCHS216
CD74HC4520	16	Dual Binary Up Counter	✔		✔			SCHS216
CD74HC4538	16	Dual Retriggerable Monostable Multivibrator	✔	✔	✔			SCHS123
CD74HC4543	16	BCD-to-7-Segment LCD Latch/Decoder/Driver		✔				SCHS219
SN74HC7001	14	Quad 2-Input Positive-AND Gate		✔	✔			SCLS035B
SN74HC7002	14	Quad 2-Input Positive-NOR Gate		✔	✔			SCLS033C
SN74HC7032	14	Quad 2-Input Positive-OR Gate		✔	✔			SCLS036B
CD74HC7046A	16	Phase-Locked Loop With VCO and Lock Detector		✔	✔			SCHS218
CD74HC7266	14	Quad 2-Input Exclusive-NOR Gate	✔	✔	✔			SCHS219
CD74HC40103	16	8-Stage Synchronous Down Counter	✔	✔	✔			SCHS221

TEXAS
INSTRUMENTS

HCT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔			SCHS116
SN74HCT00	14	Quad 2-Input Positive-NAND Gate		✔	✔	✔	✔	SCLS062B
CD74HCT02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔			SCHS125
SN74HCT02	14	Quad 2-Input Positive-NOR Gate		✔	✔	✔		SCLS065B
CD74HCT03	14	Quad 2-Input Positive-NAND Gate With Open-Drain Outputs	✔	✔	✔			SCHS126
CD74HCT04	14	Hex Inverter	✔	✔	✔			SCHS117
SN74HCT04	14	Hex Inverter	✔	✔	✔	✔	✔	SCLS042B
CD74HCT08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔			SCHS118
SN74HCT08	14	Quad 2-Input Positive-AND Gate		✔	✔	✔	✔	SCLS063B
CD74HCT10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔			SCHS128
CD74HCT11	14	Triple 3-Input Positive-AND Gate	✔	✔	✔			SCHS273
CD74HCT14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔			SCHS129
SN74HCT14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔	✔	SCLS225B
CD74HCT20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔			SCHS130
CD74HCT21	14	Dual 4-Input Positive-AND Gate		✔	✔			SCHS131
CD74HCT27	14	Triple 3-Input Positive-NOR Gate	✔	✔	✔			SCHS132
CD74HCT30	14	8-Input NAND Gate	✔	✔	✔			SCHS121
CD74HCT32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔			SCHS274
SN74HCT32	14	Quad 2-Input Positive-OR Gate		✔	✔	✔	✔	SCLS064B
CD74HCT42	16	4-to-10 BCD-to-Decimal Decoder		✔	✔			SCHS133
CD74HCT73	14	Dual J-K Flip-Flop With Reset		✔	✔			SCHS134
CD74HCT74	14	Dual D-Type Flip-Flop With Set and Reset	✔	✔	✔			SCHS124
SN74HCT74	14	Dual D-Type Flip-Flop With Set and Reset		✔	✔	✔	✔	SCLS169B
CD74HCT75	16	Dual 2-Bit Bistable Transparent Latch	✔	✔	✔			SCHS135
CD74HCT85	16	4-Bit Magnitude Comparator	✔	✔	✔			SCHS136
CD74HCT86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔			SCHS137
CD74HCT93	14	4-Bit Binary Ripple Counter		✔				SCHS138
CD74HCT107	14	Dual J-K Flip-Flop With Reset		✔				SCHS139
CD74HCT109	16	Dual J-K Flip-Flop With Set and Reset	✔	✔	✔			SCHS140
CD74HCT112	16	Dual J-K Flip-Flop With Set and Reset	✔	✔				SCHS141

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

See Appendix A for package information on CD54/74HCT devices.

schedule
✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT123	16	Dual Retriggerable Monostable Multivibrator With Resets	✔	✔	✔			SCHS142
CD74HCT125	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔			SCHS143
SN74HCT125	14	Quad Bus Buffer Gate With 3-State Outputs		✔	✔			SCLS069C
CD74HCT126	14	Quad Bus Buffer Gate With 3-State Outputs		✔	✔			SCHS144
CD74HCT132	14	Quad 2-Input NAND Gate With Schmitt-Trigger Inputs	✔	✔	✔			SCHS145
CD74HCT137	16	3-to-8 Line Decoder/Demutiplexer With Address Latches		✔	✔			SCHS146
CD74HCT138	16	3-to-8 Line Decoder/Demultiplexer	✔	✔	✔			SCHS147A
SN74HCT138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔	✔	✔	SCLS171C
CD74HCT139	16	Dual 2-to-4 Line Decoder/Demultiplexer	✔	✔	✔			SCHS148
SN74HCT139	16	Dual 2-to-4 Line Decoder/Demultiplexer		✔	✔	✔	✔	SCLS066B
CD74HCT147	16	10-to-4 Line Priority Encoder		✔				SCHS149
CD74HCT151	16	8-Input Multiplexer	✔	✔	✔			SCHS150
CD74HCT153	16	Dual 4-Input Multiplexer	✔	✔	✔			SCHS151
CD74HCT154	24	4-to-16 Line Decoder/Demultiplexer	✔	✔	✔			SCHS152
CD74HCT157	16	Quad 2-Input Multiplexer	✔	✔	✔			SCHS153
SN74HCT157	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔			SCLS071B
CD74HCT158	16	Quad 2-Input Multiplexer	✔	✔				SCHS153
CD74HCT161	16	4-Bit Presettable Binary Counter	✔	✔	✔			SCHS154
CD74HCT163	16	4-Bit Presettable Binary Counter	✔	✔	✔			SCHS154
CD74HCT164	14	8-Bit Serial-In/Parallel-Out Shift Register	✔	✔	✔			SCHS155
CD74HCT165	16	8-Bit Parallel-In/Serial-Out Shift Register	✔	✔	✔			SCHS156
CD74HCT166	16	8-Bit Parallel-In/Serial-Out Shift Register	✔	✔	✔			SCHS157
CD74HCT173	16	Quad D-Type Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS158
CD74HCT174	16	Hex D-Type Flip-Flop With Reset	✔	✔	✔			SCHS159
CD74HCT175	16	Quad D-Type Flip-Flop With Reset	✔	✔	✔			SCHS160
CD74HCT191	16	Presettable Synchronous 4-Bit Binary Up/Down Counter	✔	✔	✔			SCHS162
CD74HCT193	16	Presettable Synchronous 4-Bit Binary Up/Down Counter	✔	✔				SCHS163
CD74HCT194	16	4-Bit Bidirectional Universal Shift Register		✔				SCHS164
CD74HCT221	16	Dual Monostable Multivibrator With Reset		✔	✔			SCHS166A
CD74HCT237	16	3-to-8 Line Decoder/Demutiplexer With Address Latches		✔				SCHS146
CD74HCT238	16	3-to-8 Line Decoder/Demutiplexer	✔	✔	✔			SCHS147A
CD74HCT240	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS167
SN74HCT240	20	Octal Buffer/Driver		✔	✔			SCLS174B
CD74HCT241	20	Octal Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS167
CD74HCT243	14	Quad Bus Transceiver With 3-State Outputs	✔	✔	✔			SCHS168
CD74HCT244	20	Octal Buffer/Line Driver With 3-State Outputs		✔	✔			SCHS167
SN74HCT244	20	Octal Buffer/Driver		✔	✔	✔	✔	SCLS175B
CD74HCT245	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔			SCHS119

TEXAS
INSTRUMENTS

HCT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74HCT245	20	Octal Bus Transceiver	✔	✔	✔	✔	✔	SCLS020C
CD74HCT251	16	8-Input Multiplexer With 3-State Outputs	✔	✔	✔			SCHS169
CD74HCT253	16	Dual 4-Input Multiplexer		✔	✔			SCHS170
CD74HCT257	16	Quad 2-Input Multiplexer With 3-State Outputs	✔	✔	✔			SCHS171
SN74HCT257	16	Quad 2-to-1 Data Selector/Multiplexer		✔	✔			SCLS072B
CD74HCT258	16	Quad 2-Input Multiplexer With Inverting 3-State Outputs	✔	✔				SCHS172
CD74HCT259	16	8-Bit Addressable Latch	✔	✔	✔			SCHS173
CD74HCT273	20	Octal D-Type Flip-Flop With Reset	✔	✔	✔			SCHS174
SN74HCT273	20	Octal D-Type Flip-Flop With Clear		✔	✔	✔	✔	SCLS068C
CD74HCT280	14	9-Bit Odd/Even Parity Generator/Checker	✔	✔				SCHS175
CD74HCT283	16	High-Speed CMOS Logic 4-Bit Binary Full Adder	✔	✔	✔			SCHS176
CD74HCT297	16	Digital Phase-Locked Loop		✔				SCHS177
CD74HCT299	20	8-Bit Universal Shift Register With 3-State Outputs	✔	✔	✔			SCHS178
CD74HCT354	20	8-Input Multiplexer/Register With 3-State Outputs		✔				SCHS179
CD74HCT356	20	8-Input Multiplexer/Register With 3-State Outputs		✔	✔			SCHS277
CD74HCT365	16	Hex Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS180
CD74HCT367	16	Hex Buffer/Line Driver With 3-State Outputs	✔	✔	✔			SCHS181
CD74HCT368	16	Hex Buffer/Line Driver With 3-State Outputs		✔	✔			SCHS181
CD74HCT373	20	Octal Transparent Latch With 3-State Outputs	✔	✔	✔			SCHS182
SN74HCT373	20	Octal D-Type Transparent Latch	✔	✔	✔	✔	✔	SCLS009B
CD74HCT374	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS183
SN74HCT374	20	Octal D-Type Flip-Flop	✔	✔	✔	✔		SCLS005B
CD74HCT377	20	Octal D-Type Flip-Flop With Data Enable	✔	✔	✔			SCHS184
SN74HCT377	20	Octal D-Type Flip-Flop With Clock Enable		✔	✔			SCLS067C
CD74HCT390	16	Dual Decade Ripple Counter	✔	✔	✔			SCHS185
CD74HCT393	14	Dual 4-Stage Binary Counter	✔	✔	✔			SCHS186
CD74HCT423	16	Dual Retriggerable Monostable Multivibrator With Resets		✔	✔			SCHS142
CD74HCT533	20	Octal Transparent Latch With 3-State Outputs	✔	✔				SCHS187
CD74HCT540	20	Octal Buffer and Line Driver With 3-State Outputs		✔	✔			SCHS189
SN74HCT540	20	Octal Buffer/Driver	✔	✔	✔			SCLS008B
CD74HCT541	20	Octal Buffer and Line Driver With 3-State Outputs	✔	✔	✔			SCHS189
SN74HCT541	20	Octal Buffer/Driver	✔	✔	✔	✔		SCLS306A
CD74HCT563	20	Octal Transparent Latch With 3-State Outputs		✔	✔			SCHS187
CD74HCT564	20	Octal D-Type Inverting Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS188
CD74HCT573	20	Octal Transparent Latch With 3-State Outputs	✔	✔	✔			SCHS182
SN74HCT573A	20	Octal D-Type Transparent Latch		✔	✔	✔	✔	Call
CD74HCT574	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔			SCHS183
SN74HCT574	20	Octal D-Type Flip-Flop		✔	✔		✔	SCLS177C

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT597	16	8-Bit Shift Register With Input Storage		✔	✔			SCHS191
SN74HCT623	20	Octal Bus Transceiver		✔	✔			SCLS016B
CD74HCT640	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔			SCHS192
SN74HCT645	20	Octal Bus Transceiver		✔	✔			SCLS019B
CD74HCT646	24	Octal Bus Transceiver/Register With 3-State Outputs			✔			SCHS278
SN74HCT646	24	Octal Registered Bus Transceiver		✔	✔			SCLS178B
CD74HCT652	24	Octal Bus Transceiver/Register With 3-State Outputs			✔			SCHS194
SN74HCT652	24	Octal Registered Bus Transceiver		✔	✔			SCLS179B
CD74HCT670	16	4-by-4 Register File		✔	✔			SCHS195
CD74HCT688	20	8-Bit Magnitude Comparator	✔	✔	✔			SCHS196
CD74HCT4020	16	14-Stage Binary Counter	✔	✔	✔			SCHS201
CD74HCT4024	14	7-Stage Binary Ripple Counter	✔		✔			SCHS202
CD74HCT4040	16	12-Stage Binary Counter	✔	✔	✔			SCHS203
CD74HCT4046A	16	Phase-Locked Loop With VCO	✔	✔	✔			SCHS204
CD74HCT4051	16	Analog Multiplexer/Demultiplexer	✔	✔	✔			SCHS122A
CD74HCT4052	16	Analog Multiplexer/Demultiplexer		✔	✔			SCHS122A
CD74HCT4053	16	Analog Multiplexer/Demultiplexer		✔	✔			SCHS122A
CD74HCT4060	16	14-Stage Binary Counter With Oscillator	✔	✔	✔			SCHS207
CD74HCT4066	14	Quad Bilateral Switch		✔	✔			SCHS208
CD74HCT4067	24	16-Channel Analog Multiplexer/Demultiplexer			✔			SCHS209
CD74HCT4075	14	Triple 3-Input OR Gate	✔	✔				SCHS210
CD74HCT4094	16	8-Stage Shift-and-Store Bus Register With 3-Stage Outputs		✔	✔			SCHS211
CD74HCT4316	16	Quad Analog Switch With Level Translation		✔	✔			SCHS212
CD74HCT4351	20	Analog Multiplexer/Demultiplexer With Latches		✔				SCHS213
CD74HCT4511	16	BCD-to-7-Segment Latch/Decoder/Driver		✔				SCHS279
CD74HCT4514	24	4-to-16 Line Decoder/Demultiplexer With Input Latches		✔				SCHS280
CD74HCT4520	16	Dual Binary Up Counter		✔	✔			SCHS216
CD74HCT4538	16	Dual Retriggerable Monostable Multivibrator	✔	✔	✔			SCHS123
CD74HCT4543	16	BCD-to-7-Segment LCD Latch/Decoder/Driver		✔				SCHS281
CD74HCT7046A	16	Phase-Locked Loop With VCO and Lock Detector		✔	✔			SCHS218
CD74HCT40103	16	8-Stage Synchronous Down Counter		✔	✔			SCHS221
CD74HCT40105	16	4-Bit by 16-Word FIFO Register	✔	✔	✔			SCHS222

TEXAS
INSTRUMENTS

IEEE 1149.1 (JTAG) Boundary-Scan Logic

The IEEE 1149.1 (JTAG) boundary-scan logic family of octal, Widebus™, and scan-support functions incorporates circuitry that allows these devices and the electronic systems in which they are used to be tested without reliance on traditional probing techniques.

Bus-interface logic devices are available in BCT, ABT, and LVT technologies in 8-, 18-, and 20-bit options of the standard buffers, latches, and transceivers. The universal bus transceiver (UBT™), which can functionally replace 50+ standard bus-interface devices, is featured at Widebus widths (18 and 20 bits). Package options for these devices include plastic dual in-line (PDIP), small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin quad flatpack (TQFP). The scan-support functions include devices for controlling the test bus, performing at-speed functional testing, and partitioning the scan path into smaller, more manageable segments.

Over 40 devices, composed of a wide selection of BCT and ABT octals, ABT and LVT Widebus, and scan-support functions, are available. Bus-hold and series damping resistor features also are available.

See www.ti.com/sc/logic for the most current data sheets.

IEEE 1149.1 (JTAG) Boundary-Scan Logic
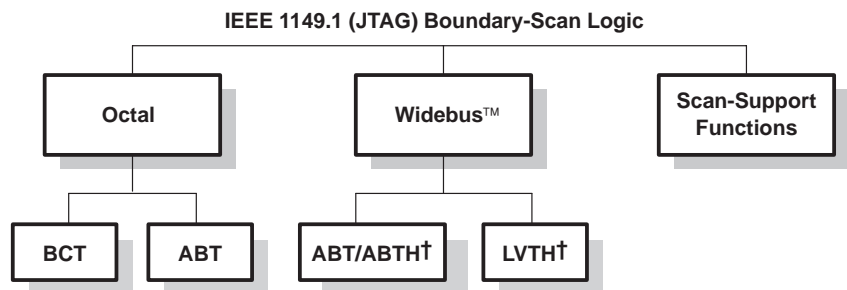
† "H" indicates bus hold

DEVICE SELECTION GUIDE

IEEE 1149.1 (JTAG) BOUNDARY-SCAN LOGIC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	PLCC	TQFP	
Widebus™ Devices With Dual-Sided Terminals										
SN74ABT18245A	56	18-Bit Bus Transceiver	✔			✔	✔			SCBS110H
SN74ABT18640	56	18-Bit Inverting Bus Transceiver				✔	✔			SCBS267C
SN74LVT18512	64	18-Bit Universal Bus Transceiver					✔			SCBS711
SN74LVTH18512	64	18-Bit Universal Bus Transceiver					✔			SCBS671B
SN74LVTH182512	64	18-Bit Universal Bus Transceiver					✔			SCBS671B
SN74LVTH18514	64	20-Bit Universal Bus Transceiver					✔			SCBS670C
SN74LVTH182514	64	20-Bit Universal Bus Transceiver					✢			SCBS670C
SN74LVTH18516	64	18-Bit Universal Bus Transceiver					✢			SCBS672B
SN74LVTH182516	64	18-Bit Universal Bus Transceiver					✢			SCBS672B
Widebus™ Devices With Quad-Sided Terminals										
SN74ABTH18502A	64	18-Bit Universal Bus Transceiver	✔						✔	SCBS164E
SN74ABTH182502A	64	18-Bit Universal Bus Transceiver							✔	SCBS164E
SN74ABTH18504A	64	20-Bit Universal Bus Transceiver							✔	SCBS165C
SN74ABTH182504A	64	20-Bit Universal Bus Transceiver							✔	SCBS165C
SN74ABTH18646A	64	18-Bit Registered Bus Transceiver	✔						✔	SCBS166D
SN74ABTH182646A	64	18-Bit Registered Bus Transceiver							✔	SCBS166D
SN74ABTH18652A	64	18-Bit Registered Bus Transceiver							✔	SCBS167D
SN74ABTH182652A	64	18-Bit Registered Bus Transceiver							✔	SCBS167D
SN74LVTH18502A	64	18-Bit Universal Bus Transceiver	✔						✔	SCBS668B
SN74LVTH182502A	64	18-Bit Universal Bus Transceiver							✔	SCBS668B
SN74LVTH18504A	64	20-Bit Universal Bus Transceiver							✔	SCBS667B
SN74LVTH182504A	64	20-Bit Universal Bus Transceiver							✔	SCBS667B
SN74LVTH18646A	64	18-Bit Registered Bus Transceiver	✔						✔	SCBS311D
SN74LVTH182646A	64	18-Bit Registered Bus Transceiver							✔	SCBS311D
SN74LVTH18652A	64	18-Bit Registered Bus Transceiver							✔	SCBS312C
SN74LVTH182652A	64	18-Bit Registered Bus Transceiver							✔	SCBS312C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN   = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB   = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL   = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✢ = Planned

TEXAS
INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	MIL	PDIP	SOIC	SSOP	TSSOP	PLCC	TQFP	LITERATURE REFERENCE
Octal Bus-Interface Devices										
SN74ABT8245	24	Octal Bus Transceiver	✔		✔					SCBS124D
SN74ABT8543	28	Octal Registered Bus Transceiver	✔		✔	✔				SCBS120E
SN74ABT8646	28	Octal Registered Bus Transceiver	✔		✔	✔				SCBS123E
SN74ABT8652	28	Octal Registered Bus Transceiver	✔		✔	✔				SCBS122F
SN74ABT8952	28	Octal Registered Bus Transceiver			✔	✔				SCBS121D
SN74BCT8240A	24	Octal Buffer/Driver	✔	✔	✔					SCBS067E
SN74BCT8244A	24	Octal Buffer/Driver	✔	✔	✔					SCBS042E
SN74BCT8245A	24	Octal Bus Transceiver	✔	✔	✔					SCBS043E
SN74BCT8373A	24	Octal D-Type Latch	✔	✔	✔					SCBS044F
SN74BCT8374A	24	Octal D-Type Flip-Flop	✔	✔	✔					SCBS045E
Scan-Support Devices										
SN74LVT8980	24	Embedded Test Bus Controller	✧		✔					SCBS676C
SN74ACT8990	44	Test Bus Controller	✔					✔		SCAS190E
SN74ACT8994	28	Digital Bus Monitor						✔		SCAS196E
SN74ABT8996	24	Addressable Scan Port	✔		✔		✔			SCBS489C
SN74LVT8996	24	Addressable Scan Port	✧		✧		✧			SCBS686
SN74ACT8997	28	Scan-Path Linker	✔	✔	✔					SCAS157D
SN74ACT8999	28	Scan-Path Selector	✔	✔	✔					SCAS158D

TEXAS INSTRUMENTS

LS
Low-Power Schottky Logic

With a wide array of functions, TI's LS family continues to offer replacement alternatives for mature systems. This classic line of devices was at the cutting edge of performance when introduced, and continues to deliver excellent value for many of today's designs. As the world leader in logic products, TI is committed to being the last major supplier at every price-performance node.

See www.ti.com/sc/logic for the most current data sheets.

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	✔	SDLS025
SN74LS01	14	Quad 2-Input Positive-NAND Gate With Open-Collector Outputs	✔	✔	✔		SDLS026
SN74LS02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔		SDLS027
SN74LS03	14	Quad 2-Input Positive-NAND Gate With Open-Collector Outputs	✔	✔	✔		SDLS028
SN74LS04	14	Hex Inverter	✔	✔	✔		SDLS029
SN74LS05	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	✔	SDLS030
SN74LS06	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	✔	SDLS020A
SN74LS07	14	Hex Buffer With Open-Collector Outputs	✔	✔	✔	✔	SDLS021A
SN74LS08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔		SDLS033
SN74LS09	14	Quad 2-Input Positive-AND Gate With Open-Collector Outputs	✔	✔	✔		SDLS034
SN74LS10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔		SDLS035
SN74LS11	14	Triple 3-Input Positive-AND Gate	✔	✔	✔		SDLS131
SN74LS14	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔	SDLS049
SN74LS19A	14	Hex Inverter With Schmitt Trigger		✔	✔		SDLS138
SN74LS20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔		SDLS079
SN74LS21	14	Dual 4-Input Positive-AND Gate	✔	✔	✔		Call
SN74LS26	14	Quad 2-Input NAND Gate	✔	✔	✔		SDLS087
SN74LS27	14	Triple 3-Input Positive-NOR Gate	✔	✔	✔		SDLS089
SN74LS30	14	8-Input Positive-NAND Gate	✔	✔	✔		SDLS099
SN74LS31	14	Delay Element		✔	✔		SDLS157
SN74LS32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔		SDLS100
SN74LS33	14	Quad 2-Input NOR Gate With Open-Collector Outputs	✔	✔	✔		SDLS101
SN74LS37	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔		SDLS103
SN74LS38	14	Quad 2-Input Positive-NAND Gate With Open-Collector Outputs	✔	✔	✔		SDLS105
SN74LS42	16	4-to-10 BCD-to-Decimal Decoder		✔	✔		SDLS109
SN74LS47	16	BCD 7-Segment Decoder/Driver	✔	✔	✔		SDLS111
SN74LS51	14	Dual 2-Input and Dual 3-Input AND/OR Gate	✔	✔	✔		SDLS113
SN74LS73A	14	Dual J-K Flip-Flop	✔	✔	✔		SDLS118
SN74LS74A	14	Dual D-Type Flip-Flop	✔	✔	✔		SDLS119
SN74LS75	16	4-Bit D-Type Latch	✔	✔	✔		SDLS120

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS85	16	4-Bit Magnitude Comparator	✔	✔	✔		SDLS123
SN74LS86A	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔		SDLS124
SN74LS90	14	Decade Counter	✔	✔	✔		Call
SN74LS92	14	Divide-by-12 Counter		✔	✔		Call
SN74LS93	14	4-Bit Binary Counter	✔	✔	✔		Call
SN74LS96	16	5-Bit Shift Register		✔	✔		Call
SN74LS107A	14	Dual J-K Flip-Flop		✔	✔		SDLS036
SN74LS109A	16	Dual J-$\overline{\text{K}}$ Flip-Flop	✔	✔	✔		SDLS037
SN74LS112A	16	Dual J-K Negative-Edge-Triggered Flip-Flop	✔	✔	✔		SDLS011
SN74LS122	14	One-Shot Multivibrator	✔	✔	✔		SDLS043
SN74LS123	16	Dual Monostable Multivibrator	✔	✔	✔		SDLS043
SN74LS125A	14	Quad Bus Buffer Gate ($\overline{\text{OE}}$)	✔	✔	✔		SDLS044
SN74LS126A	14	Quad Bus Buffer Gate (OE)		✔	✔		SDLS044
SN74LS132	14	Quad 2-Input Positive-NAND With Schmitt Trigger	✔	✔	✔		SDLS047
SN74LS136	14	Quad Exclusive-OR Gate With Open-Collector Outputs	✔	✔	✔		SDLS048
SN74LS137	16	3-to-8 Decoder/Demultiplexer With Address Latch	✔	✔	✔		SDLS132
SN74LS138	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔		SDLS014
SN74LS139A	16	Dual 2-to-4 Decoder/Demultiplexer	✔	✔	✔		SDLS013
SN74LS145	16	BCD-to-Decimal Decoder/Driver	✔	✔	✔		SDLS051
SN74LS148	16	8-to-3-Line Priority Encoder	✔	✔	✔		SDLS053
SN74LS151	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔		SDLS054
SN74LS153	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔		SDLS055
SN74LS155A	16	Dual 1-to-4 Decoder	✔	✔	✔		SDLS057
SN74LS156	16	Dual 2-to-4-Line Decoder/Demultiplexer With Open-Collector Outputs	✔	✔	✔		SDLS057
SN74LS157	16	Quad 1-of-2 Data Selector/Multiplexer	✔	✔	✔		SDLS058
SN74LS158	16	Quad 1-of-2 Data Selector/Multiplexer	✔	✔	✔		SDLS058
SN74LS161A	16	4-Bit Synchronous Binary Counter	✔	✔	✔		SDLS060
SN74LS163A	16	4-Bit Synchronous Binary Counter	✔	✔	✔		SDLS060
SN74LS164	14	8-Bit Parallel-Out Serial Shift Register	✔	✔	✔		SDLS061
SN74LS165A	16	8-Bit Parallel-Load Shift Register	✔	✔	✔		Call
SN74LS166A	16	8-Bit Parallel-Load Shift Register	✔	✔	✔		SDLS063
SN74LS169B	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔		SDLS134
SN74LS170	16	4-by-4 Register File	✔	✔	✔		SDLS065
SN74LS173A	16	4-Bit D-Type Latch	✔	✔	✔		SDLS067
SN74LS174	16	Hex D-Type Flip-Flop	✔	✔	✔		SDLS068
SN74LS175	16	Quad D-Type Flip-Flop	✔	✔	✔		SDLS068
SN74LS181	24	4-Bit Arithmetic Logic Unit	✔	✔			SDLS136
SN74LS191	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔		SDLS072

TEXAS
INSTRUMENTS

LS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS193	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔	✔		SDLS074
SN74LS194A	16	4-Bit Bidirectional Universal Shift Register	✔	✔	✔		SDLS075
SN74LS195A	16	4-Bit Bidirectional Universal Shift Register	✔	✔	✔		SDLS076
SN74LS221	16	Dual Monostable Multivibrator	✔	✔	✔		SDLS213A
SN74LS240	20	Octal Buffer/Driver	✔	✔	✔		SDLS144
SN74LS241	20	Octal Buffer/Driver	✔	✔	✔		SDLS144
SN74LS243	14	Quad Bus Transceiver	✔	✔	✔		SDLS145
SN74LS244	20	Octal Buffer/Driver	✔	✔	✔		SDLS144
SN74LS245	20	Octal Bus Transceiver	✔	✔	✔	✔	SDLS146A
SN74LS247	16	BCD-to-7-Segment Decoder		✔	✔		SDLS083
SN74LS251	16	1-of-8 Data Selector/Multiplexer	✔	✔	✔		SDLS085
SN74LS253	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔		SDLS147
SN74LS257B	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔		SDLS148
SN74LS258B	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔		SDLS148
SN74LS259B	16	8-Bit Addressable Latch		✔	✔		SDLS086
SN74LS266	14	Quad 2-Input Exclusive-NOR Gate	✔	✔	✔		SDLS151
SN74LS273	20	Octal D-Type Flip-Flop	✔	✔	✔		SDLS090
SN74LS279A	16	Quad Set/Reset Latch	✔	✔	✔		SDLS093
SN74LS280	14	9-Bit Parity Generator/Checker	✔	✔	✔		SDLS152
SN74LS283	16	4-Bit Binary Full Adder	✔	✔	✔		SDLS095
SN74LS292	16	31-Bit Programmable Counter		✔			SDLS153
SN74LS293	14	4-Bit Binary Counter		✔	✔		SDLS097
SN74LS294	16	16-Bit Programmable Counter		✔			SDLS153
SN74LS297	16	Digital Phase-Lock Loop		✔			SDLS155
SN74LS298	16	Quad 2-Input Multiplexer With Storage	✔	✔	✔		SDLS098
SN74LS299	20	8-Bit Universal Shift/Storage Register	✔	✔	✔		SDLS156
SN74LS321	16	Crystal-Controlled Oscillator		✔			SDLS158
SN74LS323	20	8-Bit Universal Shift/Storage Register	✔	✔	✔		SDLS160
SN74LS348	16	8-to-3-Line Encoder	✔	✔	✔		SDLS161
SN74LS365A	16	Hex Buffer/Driver	✔	✔	✔		SDLS102
SN74LS367A	16	Hex Buffer/Driver	✔	✔	✔		SDLS102
SN74LS368A	16	Hex Buffer/Driver	✔	✔	✔		SDLS102
SN74LS373	20	Octal D-Type Transparent Latch	✔	✔	✔		SDLS165
SN74LS374	20	Octal D-Type Flip-Flop	✔	✔	✔		SDLS165
SN74LS375	16	4-Bit Bistable Latch	✔	✔	✔		SDLS166
SN74LS377	20	Octal D-Type Flip-Flop With Clock Enable	✔	✔	✔		SDLS167
SN74LS378	16	Hex D-Type Flip-Flop With Clock Enable	✔	✔	✔		SDLS167
SN74LS379	16	Quad D-Type Flip-Flop With Clock Enable	✔				SDLS167

![Texas Instruments logo]

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS382	20	4-Bit Arithmetic Logic Unit		✔			SDLS168
SN74LS390	16	Dual 4-Bit Decade Counter	✔	✔	✔		SDLS107
SN74LS393	14	Dual 4-Bit Binary Counter	✔	✔	✔		SDLS107
SN74LS395A	16	4-Bit Cascadable Shift Register	✔	✔	✔		SDLS172
SN74LS396	16	Octal Storage Register	✔	✔	✔		SDLS173
SN74LS399	16	Quad 2-Input Multiplexer	✔	✔	✔		SDLS174
SN74LS423	16	Retriggerable Multivibrator		✔	✔		SDLS175
SN74LS442	20	Bus Transceiver		✔	✔		SDLS176
SN74LS465	20	Octal Buffer/Driver		✔	✔		SDLS179
SN74LS540	20	Octal Buffer/Driver	✔	✔	✔		SDLS180
SN74LS541	20	Octal Buffer/Driver	✔	✔	✔		SDLS180
SN74LS590	16	8-Bit Binary Counter With 3-State Output Register	✔	✔	✔		SDLS003
SN74LS592	16	Binary Counter With Input Register	✔	✔	✔		SDLS004
SN74LS593	20	8-Bit Binary Counter With 3-State I/O Register	✔	✔	✔		SDLS004
SN74LS594	16	8-Bit Shift Register With Output Register		✔	✔		SDLS005
SN74LS595	16	8-Bit Shift Register With 3-State Output Register	✔	✔	✔		SDLS006
SN74LS596	16	Octal Shift Register		✔	✔		SDLS006
SN74LS597	16	Shift Register With Input Latch	✔	✔	✔		SDLS007
SN74LS598	20	Shift Register With Input Latch	✔	✔	✔		SDLS007
SN74LS599	16	Shift Register With Output Latch		✔	✔		SDLS005
SN74LS623	20	Octal Bus Transceiver		✔	✔		SDLS185
SN74LS624	14	Voltage-Controlled Oscillator		✔	✔		SDLS186
SN74LS628	14	Voltage-Controlled Oscillator	✔	✔	✔		SDLS186
SN74LS629	16	Voltage-Controlled Oscillator	✔	✔	✔		SDLS186
SN74LS640	20	Octal Bus Transceiver	✔	✔	✔		SDLS189
SN74LS640-1	20	Octal Bus Transceiver		✔	✔		SDLS189
SN74LS641	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDLS189
SN74LS641-1	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDLS189
SN74LS642	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDLS189
SN74LS642-1	20	Octal Bus Transceiver With Open-Collector Outputs		✔	✔		SDLS189
SN74LS645	20	Octal Bus Transceiver	✔	✔	✔		SDLS189
SN74LS645-1	20	Octal Bus Transceiver		✔	✔		SDLS189
SN74LS646	24	Octal Registered Bus Transceiver		✔	✔		SDLS190
SN74LS647	24	Octal Registered Bus Transceiver		✔	✔		SDLS190
SN74LS648	24	Octal Registered Bus Transceiver		✔	✔		SDLS190
SN74LS652	24	Octal Registered Bus Transceiver		✔	✔		SDLS191
SN74LS669	16	4-Bit Up/Down Counter	✔	✔	✔		SDLS192
SN74LS670	16	4-by-4 Register File	✔	✔	✔		SDLS193

TEXAS INSTRUMENTS

LS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS673	24	16-Bit Shift Register	✔	✔	✔		SDLS195
SN74LS674	24	16-Bit Shift Register	✔	✔	✔		SDLS195
SN74LS682	20	8-Bit Magnitude Comparator	✔	✔	✔		SDLS008
SN74LS684	20	8-Bit Magnitude Comparator	✔	✔	✔		SDLS008
SN74LS686	24	Octal Magnitude/Identity Comparator		✔	✔		SDLS008
SN74LS688	20	8-Bit Identity Comparator	✔	✔	✔		SDLS008
SN74LS697	20	Synchronous Up/Down Binary Counter	✔	✔	✔		Call
SN74LS699	20	Synchronous Up/Down Binary Counter		✔	✔		SDLS199

![Texas Instruments logo]

LV
Low-Voltage
CMOS Technology Logic

TI's LV CMOS technology logic products are specially designed parts for 3-V power supply use. The entire LV family also has been recharacterized to operate at 5 V.

The LV family is a 2-μ CMOS process that provides up to 8 mA of drive and propagation delays of 18 ns maximum, while having a static power consumption of only 20 μA for both bus-interface and gate functions.

The LV family is offered in the octal footprints with advanced packaging such as small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), and thin shrink small-outline package (TSSOP).

See www.ti.com/sc/logic for the most current data sheets.

LV

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			SOIC	SSOP	TSSOP	TVSOP	
SN74LV00A	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	✔	SCLS389B
SN74LV02A	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔	✔	SCLS390B
SN74LV04A	14	Hex Inverter	✔	✔	✔	✔	SCLS388B
SN74LVU04A	14	Hex Inverter	✔	✔	✔	✔	SCES130C
SN74LV08A	14	Quad 2-Input Positive-AND Gate	✔	✔	✔	✔	SCLS387B
SN74LV14A	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔	SCLS386B
SN74LV32A	14	Quad 2-Input Positive-OR Gate	✔	✔	✔	✔	SCLS385A
SN74LV74A	14	Dual D-Type Flip-Flop	✔	✔	✔	✔	SCLS381D
SN74LV125A	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔	✔	SCES124D
SN74LV126A	14	Quad Bus Buffer Gate With 3-State Outputs	✔	✔	✔	✔	SCES131C
SN74LV138A	16	3-to-8 Decoder/Demultiplexer	✔	✔	✔	✔	SCLS395B
SN74LV164A	14	8-Bit Parallel-Out Serial Shift Register	✔	✔	✔	✔	SCLS403B
SN74LV165A	16	8-Bit Parallel-Load Shift Register	✔	✔	✔	✔	SCLS402B
SN74LV174A	16	Hex D-Type Flip-Flop With Clear	✔	✔	✔	✔	SCLS401B
SN74LV240A	20	Octal Buffer/Driver With 3-State Outputs	✔	✔	✔	✔	SCLS384C
SN74LV244A	20	Octal Buffer/Driver With 3-State Outputs	✔	✔	✔	✔	SCLS383B
SN74LV245A	20	Octal Bus Transceiver With 3-State Outputs	✔	✔	✔	✔	SCLS382C
SN74LV273A	20	Octal D-Type Flip-Flop With Clear	✔	✔	✔	✔	SCLS399A
SN74LV373A	20	Octal Transparent D-Type Latch With 3-State Outputs	✔	✔	✔	✔	SCLS407A
SN74LV374A	20	Octal D-Type Flip-Flop With 3-State Outputs	✔	✔	✔	✔	SCLS408A
SN74LV573A	20	Octal Edge-Triggered D-Type Transparent Latch With 3-State Outputs	✔	✔	✔	✔	SCLS411B
SN74LV574A	20	Octal D-Type Flip-Flop	✔	✔	✔	✔	SCLS412B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

![Texas Instruments logo]

LVC
Low-Voltage
CMOS Technology Logic

TI's LVC products are specially designed for 3-V power supplies.

The LVC family is a high-performance version with 0.8-μ CMOS process technology, 24-mA current drive, and 6.5-ns maximum propagation delays for driver operations. The LVC family includes both bus-interface and gate functions with 70 different functions planned.

The LVC family is offered in the octal and Widebus™ footprints with all of the advanced packaging such as small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), and thin shrink small-outline package (TSSOP) with planned thin very small-outline (TVSOP) additions.

All LVC devices are available with 5-V tolerant inputs and outputs.

See www.ti.com/sc/logic for the most current data sheets.

DEVICE SELECTION GUIDE

LVC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	SOIC	SSOP	TSSOP	TVSOP	SOT	LFBGA	
SN74LVC1G00A	5	Single 2-Input Positive-NAND Gate						✢		SCAS609A
SN74LVC1G02A	5	Single 2-Input Positive-NOR Gate						✢		SCAS610A
SN74LVC1G04A	5	Single Inverter Gate						✢		SCES132A
SN74LVC1G05A	5	Single Hex Inverter Gate						✢		SCES096
SN74LVC1G08A	5	Single 2-Input Positive-AND Gate						✢		SCES133A
SN74LVC1G14A	5	Single Schmitt-Trigger Inverter Gate						✢		SCES134A
SN74LVC1G32A	5	Single 2-Input Positive-OR Gate						✢		SCES135A
SN74LVC1G79A	5	Single D-Type Flip-Flop Without Preset and Clear						✢		SCES199
SN74LVC1G86A	5	Single 2-Input Exclusive-OR Gate						✢		SCES136A
SN74LVC1G125A	5	Single Bus Buffer Gate ($\overline{\text{OE}}$)						✢		SCES209
SN74LVC1G126A	5	Single Bus Buffer Gate (OE)						✢		SCES211
SN74LVC00A	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	✔				SCAS279H
SN74LVC02A	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔	✔				SCAS280I
SN74LVC04A	14	Hex Inverter	✔	✔	✔	✔				SCAS281I
SN74LVCU04A	14	Hex Inverter		✔	✔	✔				SCAS282G
SN74LVC06A	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	✔	✔			SCAS596D
SN74LVC07A	14	Hex Buffer With Open-Collector Outputs	✔	✔	✔	✔	✔			SCAS595G
SN74LVC08A	14	Quad 2-Input Positive-AND Gate	✔	✔	✔	✔				SCAS283G
SN74LVC10A	14	Triple 3-Input Positive-NAND Gate		✔	✔	✔				SCAS284G
SN74LVC14A	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	✔				SCAS285J
SN74LVC32A	14	Quad 2-Input Positive-OR Gate	✔	✔	✔	✔				SCAS286H
SN74LVC74A	14	Dual Positive-Edge-Triggered D-Type Flip-Flop	✔	✔	✔	✔				SCAS287I
SN74LVC86A	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔	✔				SCAS288I
SN74LVC112A	16	Dual Negative-Edge-Triggered J-K Flip-Flop		✔	✔	✔	✔			SCAS289G
SN74LVC125A	14	Quad Bus Buffer Gate ($\overline{\text{OE}}$)		✔	✔	✔				SCAS290F
SN74LVC126A	14	Quad Bus Buffer Gate (OE)		✔	✔	✔	✔			SCAS339H

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
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QFP (quad flatpack)
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PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✢ = Planned

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	SOIC	SSOP	TSSOP	TVSOP	SOT	LFBGA	
SN74LVC137A	16	3-to-8 Decoder/Demultiplexer With Address Latches		÷	÷	÷				SCAS340E
SN74LVC138A	16	3-to-8 Decoder/Demultiplexer	✓	✓	✓	✓				SCAS291I
SN74LVC139A	16	Dual 2-to-4 Decoder/Demultiplexer		✓	✓	✓				SCAS341G
SN74LVC157A	16	Quad 2-to-1 Data Selector/Multiplexer		✓	✓	✓				SCAS292G
SN74LVC158A	16	Quad 2-to-1 Data Selector/Multliplexer		÷	÷	÷				SCAS342F
SN74LVC240A	20	Octal Buffer/Driver		✓	✓	✓	✓			SCAS293F
SN74LVC241A	20	Octal Buffer/Driver		÷	÷	÷				SCAS343E
SN74LVC244A	20	Octal Buffer/Driver		✓	✓	✓	✓			SCAS414I
SN74LVCH244A	20	Octal Buffer/Driver With Bus Hold	✓	✓	✓	✓	✓			SCES009G
SN74LVC245A	20	Octal Bus Transceiver		✓	✓	✓	✓			SCAS218J
SN74LVCH245A	20	Octal Bus Transceiver With Bus Hold	✓	✓	✓	✓	✓			SCES008F
SN74LVC257A	16	Quad 2-to-1 Data Selector/Multliplexer		✓	✓	✓				SCAS294G
SN74LVC258A	16	Quad 2-to-1 Data Selector/Multliplexer		÷	÷	÷				SCAS345F
SN74LVC373A	20	Octal D-Type Transparent Latch	✓	✓	✓	✓	✓			SCAS295J
SN74LVC374A	20	Octal D-Type Flip-Flop	✓	✓	✓	✓	✓			SCAS296I
SN74LVC540A	20	Octal Buffer/Driver	✓	✓	✓	✓	✓			SCAS297H
SN74LVC541A	20	Octal Buffer/Driver	✓	✓	✓	✓	✓			SCAS298H
SN74LVC543A	24	Octal Registered Bus Transceiver		✓	✓	✓				SCAS299F
SN74LVC544A	24	Octal Registered Transceiver		÷	÷	÷				SCAS346E
SN74LVC573A	20	Octal D-Type Transparent Latch	✓	✓	✓	✓	✓			SCAS300I
SN74LVC574A	20	Octal D-Type Flip-Flop	✓	✓	✓	✓	✓			SCAS301J
SN74LVC646A	24	Octal Registered Bus Transceiver	✓	✓	✓	✓				SCAS302G
SN74LVC652A	24	Octal Registered Bus Transceiver	✓	✓	✓	✓	✓			SCAS303H
SN74LVC821A	24	10-Bit Bus-Interface Flip-Flop		✓	✓	✓	✓			SCAS304F
SN74LVC823A	24	9-Bit Bus-Interface Flip-Flop		✓	✓	✓	✓			SCAS305F
SN74LVC827A	24	10-Bit Buffer/Driver		✓	✓	✓	✓			SCAS306G
SN74LVC828A	24	10-Bit Buffer/Driver		✓	✓	✓	✓			SCAS347E
SN74LVC841A	24	10-Bit Bus-Interface D-Type Latch		✓	✓	✓	✓			SCAS307H
SN74LVC843A	24	9-Bit Bus-Interface D-Type Latch		÷	÷	÷				SCAS308E
SN74LVC861A	24	10-Bit Bus Transceiver		✓	✓	✓	✓			SCAS309F
SN74LVC863A	24	9-Bit Bus Transceiver		✓	✓	✓	✓			SCAS310G
SN74LVC2244A	20	Octal Buffer/Driver With Series Damping Resistors		✓	✓	✓	✓			SCAS572F
SN74LVCR2245A	20	Octal Bus Transceiver With Series Damping Resistors		✓	✓	✓	✓			SCAS581D
SN74LVC2952A	24	Octal Registered Bus Transceiver		✓	✓	✓	✓			SCAS311F
SN74LVCC3245A	24	Octal Bus Transceiver With Adjustable Output Voltage		✓	✓	✓				SCAS585F

TEXAS INSTRUMENTS

DEVICE	NO. PINS	FUNCTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	SOIC	SSOP	TSSOP	TVSOP	SOT	LFBGA	
SN74LVC4245	24	Octal Bus Transceiver and 3.3-V to 5-V Shifter		✔	✔	✔				SCAS375D
SN74LVCC4245A	24	Octal Level-Shifting Transceiver		✔	✔	✔				SCAS584E
SN74LVCH16240A	48	16-Bit Buffer/Driver With Bus Hold			✔	✔	✔			SCAS566G
SN74LVCH16241A	48	16-Bit Buffer/Driver With Bus Hold			✛	✛				SCAS348E
SN74LVC16244A	48	16-Bit Buffer/Driver			✔	✔	✔			SCES061G
SN74LVCH16244A	48	16-Bit Buffer/Driver With Bus Hold			✔	✔				SCAS313G
SN74LVC16245A	48	16-Bit Bus Transceiver			✔	✔	✔			SCES062G
SN74LVCH16245A	48	16-Bit Bus Transceiver With Bus Hold			✔	✔	✔			SCES063G
SN74LVCH16373A	48	16-Bit Transparent D-Type Latch With Bus Hold			✔	✔	✔			SCAS568G
SN74LVCH16374A	48	16-Bit Edge-Triggered D-Type Flip-Flop With Bus Hold			✔	✔	✔			SCAS565F
SN74LVCH16540A	48	16-Bit Buffer/ Driver With Bus Hold			✔	✔	✔			SCAS569G
SN74LVCH16541A	48	16-Bit Buffer/ Driver With Bus Hold			✔	✔	✔			SCAS567G
SN74LVCH16543A	56	16-Bit Registered Bus Transceiver With Bus Hold			✔	✔	✔			SCAS317F
SN74LVCH16646A	56	16-Bit Registered Bus Transceiver With Bus Hold			✔	✔	✔			SCAS318H
SN74LVCH16652A	56	16-Bit Registered Bus Transceiver With Bus Hold			✔	✔	✔			SCAS319G
SN74LVCH16901	64	18-Bit UBT With Parity Generators/Checkers				✔				SCES145A
SN74LVCH16952A	56	16-Bit Registered Bus Transceiver			✔	✔	✔			SCAS320F
SN74LVC161284	48	17-Bit IEEE P1284 Driver/Receiver			✔	✔				SCAS583I
SN74LVCH162244A	48	16-Bit Buffer/Driver With Series Damping Resistors and Bus Hold			✔	✔	✔			SCAS545F
SN74LVCHR162245A	48	16-Bit Bus Transceiver With Series Damping Resistors and Bus Hold				✔				SCAS582F
SN74LVCH32244A	96	32-Bit Buffer/Driver							✛	SCAS617
SN74LVCH32245A	96	32-Bit Bus Transceiver							✛	SCAS616

TEXAS INSTRUMENTS

LVT
Low-Voltage
BiCMOS Technology Logic

LVT is a 5-V tolerant, 3.3-V product using the latest 0.72-μ BiCMOS technology with performance specifications ideal for workstation, networking, and telecommunications applications. LVT provides superior performance, delivering 3.5-ns propagation delays at 3.3 V (28% faster than ABT at 5 V), current drive of 64 mA, and pin-for-pin compatibility with existing ABT families.

LVT operates at LVTTL signal levels in telecom and networking high-performance system point-to-point or distributed backplanes applications. LVT is an excellent migration path from ABT.

In addition to popular octal and Widebus bus-interface devices, TI also offers the universal bus transceiver (UBT™) in this low-voltage family.

Performance characteristics of the LVT family are:
- 3.3-V operation with 5-V tolerant I/O – Capability to interface with a mixed-voltage environment. The I/Os can handle up to 7 V, which allows them to act as 5-V/3-V translators.
- Speed – Provides high performance with maximum propagation delays of 3.5 ns at 3.3 V for buffers.
- Drive – Provides up to 64 mA of drive at 3.3-V V_{CC}, yet consumes less than 330 μW of standby power.

Additional features include:
- Live insertion – LVT devices incorporate I_{off} and power-up 3-state (PU3S) circuitry to protect the devices in live-insertion applications and make them ideally suited for hot-insertion applications. I_{off} prevents the devices from being damaged during partial power down, and PU3S forces the outputs to the high-impedance state during power up and power down.
- Bus hold – Eliminates floating inputs by holding them at the last valid logic state. This eliminates the need for external pullup and pulldown resistors.
- Damping-resistor option – TI implements series damping resistors on selected devices, which not only reduces overshoot and undershoot, but also matches the line impedance, minimizing ringing.
- Packaging – LVT devices are available in small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP) (select devices).

See www.ti.com/sc/logic for the most current data sheets.

LVT

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	SOIC	SSOP	TSSOP	TVSOP	
LVT Octals (SN74LVTxxx, SN74LVTHxxx))								
SN74LVTH125	14	Quad Bus Buffer Gate		✔	✔	✔	✔	SCBS703C
SN74LVT240A	20	Octal Buffer/Driver Without Bus Hold		✔	✔	✔		SCBS134H
SN74LVTH240	20	Octal Buffer/Driver	★	✔	✔	✔		SCBS679C
SN74LVTH241	20	Octal Buffer/Driver	★	✔	✔	✔		SCAS352H
SN74LVT244B	20	Octal Buffer/Driver Without Bus Hold		✔	✔	✔		SCAS354D
SN74LVTH244A	20	Octal Buffer/Driver	★	✔	✔	✔		SCAS586C
SN74LVT245B	20	Octal Bus Transceiver Without Bus Hold		✔	✔	✔		SCES004B
SN74LVTH245A	20	Octal Bus Transceiver	✔	✔	✔	✔		SCBS130O
SN74LVTH273	20	Octal D-Type Flip-Flop With Clear	★	✔	✔	✔		SCBS136J
SN74LVTH373	20	Octal D-Type Latch	★	✔	✔	✔		SCBS689D
SN74LVTH374	20	Octal Edge-Triggered D-Type Flip-Flop	★	✔	✔	✔		SCBS683D
SN74LVTH540	20	Octal Buffer/Driver		✔	✔	✔		SCBS681D
SN74LVTH541	20	Octal Buffer/Driver		✔	✔	✔		SCBS682D
SN74LVTH543	24	Octal Registered Bus Transceiver		✔	✔	✔	✔	SCBS704C
SN74LVTH573	20	Octal D-Type Transparent Latch	✔	✔	✔	✔		SCBS687D
SN74LVTH574	20	Octal D-Type Flip-Flop	✔	✔	✔	✔		SCBS688C
SN74LVTH646	24	Octal Registered Bus Transceiver	✔	✔	✔	✔	✔	SCBS705C
SN74LVTH652	24	Octal Registered Bus Transceiver		✔	✔	✔	✔	SCBS706C
SN74LVTH2952	24	Octal Registered Bus Transceiver		✔	✔	✔	✔	SCBS710C
LVT Widebus™ (SN74LVTH16xxx)								
SN74LVTH16240	48	16-Bit Buffer/Driver	★		✔	✔		SCBS684B
SN74LVTH16241	48	16-Bit Buffer/Driver			✔	✔		SCBS693B
SN74LVTH16244A	48	16-Bit Buffer/Driver	★		✔	✔	✔	SCBS142K
SN74LVTH16245A	48	16-Bit Bus Transceiver	★		✔	✔	✔	SCBS143K
SN74LVTH16373	48	16-Bit D-Type Transparent Latch	★		✔	✔		SCBS144J
SN74LVTH16374	48	16-Bit D-Type Flip-Flop	★		✔	✔		SCBS145K
SN74LVTH16500	56	18-Bit Universal Bus Transceiver			✔	✔		SCBS701B
SN74LVTH16501	56	18-Bit Universal Bus Transceiver			✔	✔		SCBS700B
SN74LVTH16541	48	16-Bit Buffer/Driver	✔		✔	✔		SCBS691C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
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PDIP (plastic dual-in-line package)
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PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now   ★ = See page 4–3.
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	SOIC	SSOP	TSSOP	TVSOP	
SN74LVTH16543	56	16-Bit Registered Bus Transceiver			✔	✔		SCBS699C
SN74LVTH16646	56	16-Bit Registered Bus Transceiver			✔	✔		SCBS698D
SN74LVTH16652	56	16-Bit Registered Bus Transceiver With 3-State Outputs			✔	✔		SCBS150J
SN74LVTH16835	56	18-Bit DFF Memory Buffer/Driver			✔	✔		SCBS713A
SN74LVTH16952	56	16-Bit Registered Bus Transceiver	✔		✔	✔		SCBS697D
LVT Octals/Widebus™ With Series Damping Resistors (SN74LVTH2xxx, SN74LVTH162xxx)								
SN74LVTH2245A	20	Octal Bus Transceiver		✔	✔	✔	✔	SCBS707B
SN74LVTH162240	48	16-Bit Buffer/Driver	✔		✔	✔		SCBS685D
SN74LVTH162241	48	16-Bit Buffer/Driver With 3-State Outputs			✔	✔		SCBS692C
SN74LVTH162244	48	16-Bit Buffer/Driver	★		✔	✔		SCBS258I
SN74LVTH162245	48	16-Bit Bus Transceiver	★		✔	✔		SCBS260J
SN74LVTH162373	48	16-Bit D-Type Transparent Latch	★		✔	✔		SCBS261I
SN74LVTH162374	48	16-Bit D-Type Flip-Flop	★		✔	✔		SCBS262H
SN74LVTH162541	48	16-Bit Buffer/Driver With 3-State Outputs			✔	✔		SCBS690D

TEXAS
INSTRUMENTS

S
Schottky Logic

With a wide array of functions, TI's S family continues to offer replacement alternatives for mature systems. This classic line of devices was at the cutting edge of performance when introduced, and continues to deliver excellent value for many of today's designs. As the world leader in logic products, TI is committed to being the last major supplier at every price-performance node.

See www.ti.com/sc/logic for the most current data sheets.

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74S00	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	SDLS025
SN74S02	14	Quad 2-Input Positive-NOR Gate	✔	✔	✔	SDLS027
SN74S03	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	SDLS028
SN74S04	14	Hex Inverter	✔	✔	✔	SDLS029
SN74S05	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	SDLS030
SN74S08	14	Quad 2-Input Positive-AND Gate	✔	✔	✔	SDLS033
SN74S09	14	Quad 2-Input Positive-AND Gate With Open-Collector Outputs	✔	✔	✔	SDLS034
SN74S10	14	Triple 3-Input Positive-NAND Gate	✔	✔	✔	SDLS035
SN74S11	14	Triple 3-Input Positive-AND Gate	✔	✔	✔	SDLS131
SN74S20	14	Dual 4-Input Positive-NAND Gate	✔	✔	✔	SDLS079
SN74S30	14	8-Input Positive-NAND Gate	✔	✔	✔	SDLS099
SN74S32	14	Quad 2-Input Positive-OR Gate	✔	✔	✔	SDLS100
SN74S37	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	SDLS103
SN74S38	14	Quad 2-Input NAND Gate With Open-Collector Outputs	✔	✔	✔	SDLS105
SN74S51	14	Dual 2-Input and Dual 3-Input AND/OR Gate	✔	✔	✔	SDLS113
SN74S74	14	Dual D-Type Flip-Flop	✔	✔	✔	SDLS119
SN74S85	14	4-Bit Magnitude Comparator	✔	✔	✔	SDLS123
SN74S86	14	Quad 2-Input Exclusive-OR Gate	✔	✔	✔	SDLS124
SN74S112A	16	Dual J-K Negative-Edge-Triggered Flip-Flop		✔	✔	SDLS011
SN74S124	16	Dual Voltage-Controlled Oscillator	✔	✔	✔	SDLS201
SN74S132	14	Quad 2-Input Positive-NAND Schmitt Trigger	✔	✔	✔	SDLS047
SN74S133	16	13-Input NAND Gate	✔	✔	✔	SDLS202
SN74S135	16	Quad Exclusive-OR/NOR Gate		✔		SDLS204
SN74S138A	16	3-to-8 Decoder/Demultiplexer		✔	✔	SDLS014
SN74S139A	16	Dual 2-to-4 Decoder/Demultiplexer		✔	✔	SDLS013
SN74S140	14	Dual 50-Ω Line Driver	✔	✔	✔	SDLS210
SN74S151	16	8-to-1 Data Selector/Multiplexer	✔	✔	✔	SDLS054
SN74S153	16	Dual 4-to-1 Data Selector/Multiplexer	✔	✔	✔	SDLS055
SN74S157	16	Quad 1-of-2 Data Selector/Multiplexer	✔	✔	✔	SDLS058
SN74S158	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔	SDLS058

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✚ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74S163	16	4-Bit Synchronous Binary Counter	✔	✔	✔	SDLS060
SN74S169	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔		SDLS134
SN74S174	16	Hex D-Type Flip-Flop	✔	✔		SDLS068
SN74S175	16	Quad D-Type Flip-Flop	✔	✔	✔	SDLS068
SN74S182	16	Look-Ahead Carry Generator	✔	✔		SDLS206
SN74S194	16	4-Bit Bidirectional Universal Shift Register	✔	✔		SDLS075
SN74S195	16	4-Bit Bidirectional Universal Shift Register	✔	✔	✔	SDLS076
SN74S240	20	Octal Buffer/Driver	✔	✔	✔	SDLS144
SN74S241	20	Octal Buffer/Driver	✔	✔	✔	SDLS144
SN74S244	20	Octal Buffer/Driver	✔	✔	✔	SDLS144
SN74S251	16	1-of-8 Data Selector/Multiplexer	✔	✔	✔	SDLS085
SN74S257	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔	✔	SDLS148
SN74S258	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔		SDLS148
SN74S260	14	Dual 5-Input Positive-NOR Gate	✔	✔	✔	SDLS208
SN74S280	14	9-Bit Parity Generator/Checker	✔	✔	✔	SDLS152
SN74S283	16	4-Bit Binary Full Adder	✔	✔		SDLS095
SN74S299	20	8-Bit Universal Shift Register	✔	✔	✔	SDLS156
SN74S373	20	Octal D-Type Transparent Latch	✔	✔	✔	SDLS165
SN74S374	20	Octal D-Type Flip-Flop	✔	✔	✔	SDLS165
SN74S381	20	Arithmetic Logic Unit	✔	✔		SDLS168

TEXAS
INSTRUMENTS

SSTL
Stub Series-Terminated Logic

SSTL is the computer industry's leading choice for next-generation technology in high-speed memory subsystems, adopted by a Joint Electronic Device Engineering Committee (JEDEC) standard and endorsed by major memory module, workstation, and PC manufacturers.

The SSTL16837 is the industry's first device for driving 3.3-V address signals from a low-voltage memory controller to SDRAMs using SSTL technology. In designs operating at >75 MHz, the SSTL16837 provides fast address signaling with minimal propagation delay. The SSTL16837 converts LVTTL signals from the memory controller to SSTL signals that are used by the SDRAM input pins. Targeted users of the device initially include workstations and servers, with eventual migration to PCs, as high-speed memory subsystem technology evolves in desktop systems.

HSTL
High-Speed Transceiver Logic

One of TI's low-voltage interface solutions is HSTL. HSTL devices accept a minimal differential input swing from 0.65 V to 0.85 V (nominally) with the outputs driving LVTTL levels. HSTL is ideally suited for driving an address bus to two banks of memory. The HSTL input levels follow the JESD8-6 standard developed through the Joint Electronic Device Engineering Committee (JEDEC).

See www.ti.com/sc/logic for the most current data sheets.

DEVICE SELECTION GUIDE

SSTL/HSTL

DEVICE	NO. PINS	FUNCTION	AVAILABILITY		LITERATURE REFERENCE
			TSSOP	LFBGA	
SSTL					
SN74SSTL16837A	64	20-Bit SSTL_3 Universal Bus Driver	✔		SCBS675G
SN74SSTL16847	64	20-Bit SSTL_3 Bus Driver (Like '244)	✔		SCBS709A
SN74SSTL16857	48	14-Bit SSTL_2/3 Universal Bus Driver	✛		SCAS625A
SN74SSTL16867	48	14-Bit SSTL_2 Registered Buffer With SSTL_2 Inputs and LVCMOS Outputs	✛		SCAS630
SN74SSTL16877	48	14-Bit Registered Buffer With SSTL_2 Inputs and Outputs	✛		SCAS631
SN74SSTL32857	96	26-Bit SSTL_2 Registered Buffer		✛	Call
SN74SSTL32867	96	26-Bit Registered Buffer With SSTL_2 Inputs and LVCMOS Outputs		✛	SCES240A
SN74SSTL32877	96	26-Bit Registered Buffer With SSTL_2 Inputs and Outputs		✛	SCES241A
HSTL					
SN74HSTL16918	48	9-Bit to 18-Bit HSTL-to-LVTTL Memory Address Latch	✔		SCES096C
SN74HSTL162822	64	14-Bit HSTL-to-LVTTL Memory Address Latch	✔		SCES091A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
PM   = 64 pins
PN   = 80 pins
PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

TEXAS INSTRUMENTS

TTL
Transistor-Transistor Logic

With a wide array of functions, TI's TTL family continues to offer replacement alternatives for mature systems. This classic line of devices was at the cutting edge of performance when introduced, and continues to deliver excellent value for many of today's designs. As the world leader in logic products, TI is committed to being the last major supplier at every price-performance node.

See www.ti.com/sc/logic for the most current data sheets.

TTL

DEVICE	NO. PINS	FUNCTION	AVAILABILITY MIL	AVAILABILITY PDIP	AVAILABILITY SOIC	LITERATURE REFERENCE
SN7400	14	Quad 2-Input Positive-NAND Gate	✔	✔	✔	SDLS025
SN7402	14	Quad 2-Input Positive-NOR Gate	✔	✔		SDLS027
SN7404	14	Hex Inverter	✔	✔	✔	SDLS029
SN7405	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	SDLS030
SN7406	14	Hex Inverter With Open-Collector Outputs	✔	✔	✔	SDLS031
SN7407	14	Hex Buffer With Open-Collector Outputs	✔	✔	✔	SDLS032A
SN7410	14	Triple 3-Input Positive-NAND Gate		✔		SDLS035
SN7414	14	Hex Inverter With Schmitt Trigger	✔	✔	✔	SDLS049
SN7416	14	Hex Inverter/Driver	✔	✔	✔	SDLS031
SN7417	14	Hex Buffer/Driver With Open-Collector Outputs	✔	✔	✔	SDLS032A
SN7425	14	Dual 4-Input NOR Gate	✔	✔		SDLS082
SN7430	14	8-Input Positive-NAND Gate	✔			SDLS099
SN7432	14	Quad 2-Input OR Gate	✔	✔		SDLS100
SN7437	14	Quad 2-Input Positive-NAND Gate	✔	✔		SDLS103
SN7438	14	Quad 2-Input Positive-NAND Gate With Open-Collector Outputs	✔	✔	✔	SDLS105
SN7445	16	BCD-to-Decimal Decoder/Driver	✔	✔		SDLS110
SN7447A	16	BCD 7-Segment Decoder/Driver	✔	✔		SDLS111
SN7474	14	Dual D-Type Flip-Flop	✔	✔	✔	SDLS119
SN7486	14	Quad 2-Input Exclusive-OR Gate	✔	✔		SDLS124
SN7497	16	Binary Rate Multiplier	✔	✔		SDLS130
SN74121	14	One-Shot Multivibrator	✔	✔	✔	SDLS042
SN74123	16	Dual Monostable Multivibrator	✔	✔		SDLS043
SN74128	14	50-Ω Line Driver	✔	✔	✔	SDLS045
SN74132	14	Quad 2-Input Positive-NAND With Schmitt Trigger	✔	✔		SDLS047
SN74145	16	BCD-to-Decimal Decoder/Driver	✔	✔		SDLS051
SN74148	16	8-to-3-Line Priority Encoder	✔	✔		SDLS053
SN74150	24	Data Selector/Multiplexer	✔	✔		SDLS054
SN74154	24	4-to-16-Line Decoder/Demultiplexer	✔	✔	✔	SDLS056
SN74157	16	Quad 2-to-1 Data Selector/Multiplexer	✔	✔		SDLS058
SN74159	24	4-to-16-Line Decoder/Demultiplexer		✔		SDLS059

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P   = 8 pins
N   = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH   = 52 pins
PAG   = 64 pins (FB only)
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PCA, PZ = 100 pins (FB only)
PCB   = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D   = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB   = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL   = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW   = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

schedule

✔ = Now
✛ = Planned

DEVICE	NO. PINS	FUNCTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74175	16	Quad D-Type Flip-Flop	✔	✔		SDLS068
SN74193	16	4-Bit Synchronous Up/Down Binary Counter	✔	✔		SDLS074
SN74221	16	Dual Monostable Multivibrator	✔	✔		SDLS213A
SN74265	16	Quad AND/NAND Gate	✔	✔		SDLS088
SN74273	20	Octal D-Type Flip-Flop		✔		SDLS090
SN74276	20	Quad J-K Flip-Flop		✔	✔	SDLS091
SN74367A	16	Hex Buffer/Driver	✔	✔		SDLS102
SN74368A	16	Hex Buffer/Driver	✔	✔		SDLS102
SN74376	16	Quad J-K Flip-Flop	✔	✔		SDLS104
SN74393	14	Dual 4-Bit Binary Counter	✔	✔		SDLS107

TEXAS
INSTRUMENTS

TVC
Translation Voltage Clamp Logic

TI introduces the TVC family of devices. The products are designed to protect components that are sensitive to high-state voltage-level overshoots.

New designs of PCs and other bus-oriented products require faster and lower-power devices designed to use advanced submicron semiconductor processes. Often, the I/Os of these devices are intolerant of high-state voltage levels on the buses with which they must communicate. The need became apparent for I/O protection for devices that must communicate with legacy buses. The TVC family fills this need.

The TVC family of devices offers an array of n-type metal-oxide semiconductor (NMOS) field-effect transistors (FETs) with the gates cascaded together to a common gate input. TVC devices can be used as voltage limiters by connecting one of the FETs as a voltage reference transistor and the remainder as pass transistors. The low-voltage side of each pass transistor is limited to the voltage set by the reference transistor. All of the FETs in the array have essentially the same characteristics, so any one can be used as the reference transistor. Because the fabrication of the FETs is symmetrical, either port connection for each bit can be used as the low-voltage side, and the I/O signals are bidirectional through each FET.

Key features:

- No logic supply-voltage required (no internal control logic)
- Act as voltage translators or voltage clamps
- 7-Ω on-state resistance with gate at 3.3 V
- Any FET can be used as the reference transistor
- Direct interface with GTL+ levels
- Accept any I/O voltage from 0 to 5.5 V
- Flow-through pinout for ease of printed circuit board layout
- Minimum variation in transistor characteristics due to fabrication process

See www.ti.com/sc/logic for the most current data sheets.

TVC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			SOIC	SSOP	TSSOP	TVSOP	
SN74TVC3010	24	10-Bit Voltage Clamp	✔	✔	✔	✔	SCDS088A
SN74TVC16222	48	22-Bit Voltage Clamp		✔	✔	✔	SCDS087A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

schedule

✔ = Now
✛ = Planned

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

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QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

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LOGIC PRODUCTS FORMERLY OFFERED BY HARRIS SEMICONDUCTOR	**A**

CONTENTS

CD4000, CD74AC/ACT, CD74FCT, and CD74HC/HCT/HCU

TI has long been the logic market leader. The addition of the Harris Semiconductor logic products complements TI's existing logic portfolio, providing the market with a stable, long-term, committed source of supply. TI supports the CD4000 family, select HC/HCT 4000 device types, and various other HC/HCT/HCU, AC/ACT, and FCT device types. Production will be phased into existing TI wafer fabrication facilities and assembly-test manufacturing sites.

The acquired products do not include radiation hardened or buy and resell devices.

Key Customer Benefits

- Broader logic product offering from TI – the world leader in logic products

- Committed long-term support

For additional information, please see **http://www.ti.com/sc/harris**. Additional links to other useful information can be found on this page.

This appendix contains a listing (by technology family) of the supported commercial products acquired from Harris Semiconductor (CD4000, CD74AC/ACT, CD74FCT, and CD74HC/HCT/HCU).

If you have specific questions or need additional information, please contact your authorized TI distributor, nearest TI field sales office, or the TI Product Information Center.

DEVICE NAMES AND PACKAGE DESIGNATORS
FOR LOGIC PRODUCTS FORMERLY OFFERED BY HARRIS SEMICONDUCTOR

CD4000 Nomenclature

Example

CD	4011	B	E	XX
1	2	3	4	5
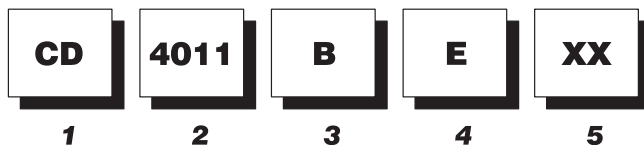
1 Prefix Designation for Harris Digital Logic IC

2 Type Designation

Up to Five Digits

3 Supply Voltage

Examples: A – 12 V Maximum
B – 18 V Maximum
UB – 18 V Maximum, Unbuffered

4 Packages

Examples: D – Ceramic Side-Brazed Dual-In-Line Package
(DIP)
E – Plastic DIP
F – Ceramic DIP
K – Ceramic Flatpack
M – Plastic Surface-Mount
Small-Outline Integrated Circuit (SOIC)
SM – Plastic Shrink SOIC (SSOP)
M96 – Reeled Plastic Surface-Mount SOIC
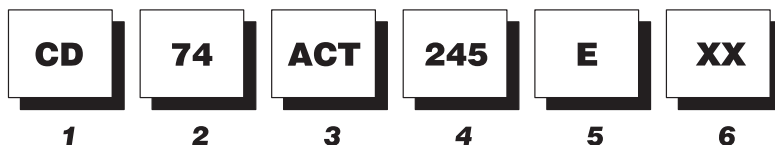SM96 – Reeled Plastic Shrink SOIC (SSOP)

5 High-Reliability Screening

Military Products Only

Example: 3 – Noncompliant With MIL-STD-883, Class B
3A – Fully Compliant With MIL-STD-883, Class B

AC/ACT Advanced CMOS and HC/HCT/HCU High-Speed CMOS Nomenclature

Example

CD	74	ACT	245	E	XX
1	2	3	4	5	6

1 Prefix Designation for Harris Digital Logic IC

2 Temperature Range

Examples: 54 – Military (–55°C to 125°C)
74 – Commercial (0°C to 70°C)

3 Family

Examples: AC – Advanced CMOS Logic, CMOS Input Levels
ACT – Advanced CMOS Logic, TTL Input Levels
HC – High-Speed CMOS Logic, CMOS Input Levels
HCT – High-Speed CMOS Logic, TTL Input Levels
HCU – High-Speed CMOS Logic, CMOS Input Levels,
Unbuffered

4 Type Designation

Up to Five Digits

5 Packages

Examples: E – Plastic Dual-In-Line Package (DIP)
EN – Plastic Slim-Line 24-Lead DIP
F – Ceramic DIP
M – Plastic Surface-Mount
Small-Outline Integrated Circuit (SOIC)
SM – Plastic Shrink SOIC (SSOP)
M96 – Reeled Plastic Surface-Mount SOIC
SM96 – Reeled Plastic Shrink SOIC (SSOP)
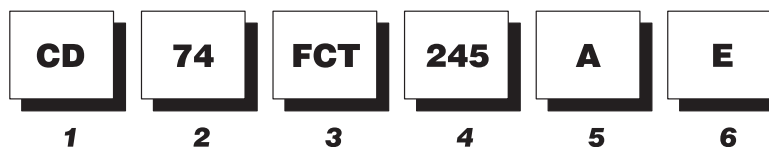
6 High-Reliability Screening

Military Products Only

Example: 3A – Fully Compliant With MIL-STD-883

FCT Nomenclature

Example

CD	74	FCT	245	A	E
1	2	3	4	5	6

1   Prefix Designation for Harris Digital Logic IC

2   Temperature Range

Examples: 54 – Military (–55°C to 125°C)
　　　　　　74 – Commercial (0°C to 70°C)

3   Family

Example: FCT – Bus Interface, TTL Input Levels

4   Type Designation

Up to Five Digits

5   Speed Grade

Examples: Blank or A – Standard Equivalent to FAST™

6   Packages

Examples: E – Plastic Dual-In-Line Package (DIP)
　　　　　　EN – Plastic Slim-Line 24-Lead DIP
　　　　　　F – Ceramic DIP
　　　　　　M – Plastic Surface-Mount
　　　　　　　　Small-Outline Integrated Circuit (SOIC)
　　　　　　SM – Plastic Shrink SOIC (SSOP)
　　　　　　M96 – Reeled Plastic Surface-Mount SOIC
　　　　　　SM96 – Reeled Plastic Shrink SOIC (SSOP)

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD4001BE	SCHS015	CD4027BM	SCHS032	CD4069UBM	SCHS054	CD4520BE	SCHS076
CD4001BM	SCHS015	CD4028BE	SCHS033	CD4069UBM96	SCHS054	CD4521BE	SCHS078
CD4001BM96	SCHS015	CD4029BE	SCHS034	CD4070BE	SCHS055	CD4522BE	SCHS079
CD4001UBE	SCHS016	CD4030BE	SCHS035	CD4070BM	SCHS055	CD4527BE	SCHS080
CD4001UBM	SCHS016	CD4030BM	SCHS035	CD4071BE	SCHS056	CD4532BE	SCHS082
CD4002BE	SCHS015	CD4031BE	SCHS036	CD4071BM	SCHS056	CD4536BE	SCHS083
CD4006BE	SCHS017	CD4033BE	SCHS031	CD4072BE	SCHS056	CD4541BE	SCHS085
CD4007UBE	SCHS018	CD4034BE	SCHS037	CD4073BE	SCHS057	CD4541BM	SCHS085
CD4007UBM	SCHS018	CD4035BE	SCHS038	CD4073BM	SCHS057	CD4541BM96	SCHS085
CD4009UBE	SCHS020	CD4040BE	SCHS030	CD4075BE	SCHS056	CD4543BE	SCHS086
CD4010BE	SCHS020	CD4041UBE	SCHS039	CD4075BM	SCHS056	CD4555BE	SCHS087
CD4011BE	SCHS021	CD4042BE	SCHS040	CD4076BE	SCHS058	CD4556BE	SCHS087
CD4011BM	SCHS021	CD4042BM	SCHS040	CD4077BE	SCHS055	CD4572UBE	SCHS090
CD4011BM96	SCHS021	CD4043BE	SCHS041	CD4077BM	SCHS055	CD4585BE	SCHS091
CD4011UBE	SCHS022	CD4043BM	SCHS041	CD4078BE	SCHS059	CD4724BE	SCHS092
CD4011UBM	SCHS022	CD4044BE	SCHS041	CD4078BM	SCHS059	CD14538BE	SCHS093
CD4012BE	SCHS021	CD4044BM	SCHS041	CD4081BE	SCHS057	CD40102BE	SCHS095
CD4012BM	SCHS021	CD4045BE	SCHS042	CD4081BM	SCHS057	CD40103BE	SCHS095
CD4012BM96	SCHS021	CD4046BE	SCHS043	CD4082BE	SCHS057	CD40105BE	SCHS096
CD4013BE	SCHS023	CD4047BE	SCHS044	CD4085BE	SCHS060	CD40106BE	SCHS097
CD4013BM	SCHS023	CD4048BE	SCHS045	CD4086BE	SCHS061	CD40106BM	SCHS097
CD4013BM96	SCHS023	CD4049UBE	SCHS046A	CD4089BE	SCHS062	CD40106BM96	SCHS097
CD4014BE	SCHS024	CD4049UBM	SCHS046A	CD4093BE	SCHS115	CD40107BE	SCHS098
CD4015BE	SCHS025	CD4049UBM96	SCHS046A	CD4093BM	SCHS115	CD40109BE	SCHS099
CD4016BE	SCHS026	CD4050BE	SCHS046A	CD4093BM96	SCHS115	CD40110BE	SCHS100
CD4016BM	SCHS026	CD4050BM	SCHS046A	CD4094BE	SCHS063	CD40117BE	SCHS101
CD4017BE	SCHS027	CD4051BE	SCHS051B	CD4097BE	SCHS052	CD40147BE	SCHS102
CD4018BE	SCHS028	CD4051BM	SCHS051B	CD4098BE	SCHS065	CD40161BE	SCHS103
CD4019BE	SCHS029	CD4051BM96	SCHS051B	CD4099BE	SCHS066	CD40174BE	SCHS104
CD4020BE	SCHS030	CD4052BE	SCHS047B	CD4502BE	SCHS067	CD40175BE	SCHS105
CD4021BE	SCHS024	CD4053BE	SCHS047B	CD4503BE	SCHS068	CD40192BE	SCHS106
CD4022BE	SCHS027	CD4054BE	SCHS048	CD4504BE	SCHS069	CD40193BE	SCHS106
CD4023BE	SCHS021	CD4055BE	SCHS048	CD4508BE	SCHS070	CD40194BE	SCHS107
CD4023BM	SCHS021	CD4056BE	SCHS048	CD4510BE	SCHS071	CD40257BE	SCHS108
CD4023BM96	SCHS021	CD4059AE	SCHS109	CD4511BE	SCHS072		
CD4024BE	SCHS030	CD4060BE	SCHS049	CD4512BE	SCHS073		
CD4024BM	SCHS030	CD4063BE	SCHS050	CD4514BE	SCHS074		
CD4024BM96	SCHS030	CD4066BE	SCHS051	CD4514BM	SCHS074		
CD4025BE	SCHS015	CD4066BM	SCHS051	CD4515BE	SCHS074		
CD4025BM	SCHS015	CD4066BM96	SCHS051	CD4515BM	SCHS074		
CD4025BM96	SCHS015	CD4067BE	SCHS052	CD4516BE	SCHS071		
CD4026BE	SCHS031	CD4068BE	SCHS053	CD4517BE	SCHS075		
CD4027BE	SCHS032	CD4069UBE	SCHS054	CD4518BE	SCHS076		

TEXAS INSTRUMENTS

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74AC00E	SCHS223	CD74AC151E	SCHS236	CD74AC273E	SCHS249
CD74AC00M	SCHS223	CD74AC151M96	SCHS236	CD74AC273M	SCHS249
CD74AC00M96	SCHS223	CD74AC153E	SCHS237	CD74AC273M96	SCHS249
CD74AC02E	SCHS224	CD74AC153M96	SCHS237	CD74AC273SM	SCHS249
CD74AC02M	SCHS224	CD74AC157E	SCHS283	CD74AC280E	SCHS250
CD74AC02M96	SCHS224	CD74AC157M	SCHS283	CD74AC280M	SCHS250
CD74AC04E	SCHS225	CD74AC157M96	SCHS283	CD74AC280M96	SCHS250
CD74AC04M	SCHS225	CD74AC158M	SCHS283	CD74AC283E	SCHS251B
CD74AC04M96	SCHS225	CD74AC161E	SCHS284	CD74AC283M	SCHS251B
CD74AC05E	SCHS225	CD74AC161M	SCHS284	CD74AC283M96	SCHS251B
CD74AC05M	SCHS225	CD74AC161M96	SCHS284	CD74AC299M96	SCHS288
CD74AC05M96	SCHS225	CD74AC163E	SCHS284	CD74AC323M	SCHS288
CD74AC08E	SCHS226	CD74AC163M	SCHS284	CD74AC373E	SCHS289
CD74AC08M	SCHS226	CD74AC163M96	SCHS284	CD74AC373M	SCHS289
CD74AC08M96	SCHS226	CD74AC164E	SCHS240	CD74AC373M96	SCHS289
CD74AC10E	SCHS227	CD74AC164M	SCHS240	CD74AC374E	SCHS290
CD74AC10M	SCHS227	CD74AC164M96	SCHS240	CD74AC374M	SCHS290
CD74AC10M96	SCHS227	CD74AC174E	SCHS241	CD74AC374M96	SCHS290
CD74AC14E	SCHS228	CD74AC174M	SCHS241	CD74AC534M96	SCHS290
CD74AC14M	SCHS228	CD74AC174M96	SCHS241	CD74AC540M	SCHS285
CD74AC14M96	SCHS228	CD74AC175M	SCHS242	CD74AC541E	SCHS285
CD74AC20E	SCHS229	CD74AC175M96	SCHS242	CD74AC541M	SCHS285
CD74AC20M	SCHS229	CD74AC238M96	SCHS234	CD74AC541M96	SCHS285
CD74AC20M96	SCHS229	CD74AC240E	SCHS287	CD74AC541SM	SCHS285
CD74AC32E	SCHS230	CD74AC240M	SCHS287	CD74AC541SM96	SCHS285
CD74AC32M	SCHS230	CD74AC240M96	SCHS287	CD74AC563E	SCHS291
CD74AC32M96	SCHS230	CD74AC244E	SCHS244	CD74AC573E	SCHS291
CD74AC74E	SCHS231	CD74AC244M	SCHS244	CD74AC573M	SCHS291
CD74AC74M	SCHS231	CD74AC244M96	SCHS244	CD74AC573M96	SCHS291
CD74AC74M96	SCHS231	CD74AC244SM	SCHS244	CD74AC574E	SCHS292
CD74AC86E	SCHS232	CD74AC244SM96	SCHS244	CD74AC574M	SCHS292
CD74AC86M	SCHS232	CD74AC245E	SCHS245	CD74AC574M96	SCHS292
CD74AC86M96	SCHS232	CD74AC245M	SCHS245	CD74AC623E	SCHS286
CD74AC109E	SCHS282	CD74AC245M96	SCHS245	CD74AC646M	SCHS293
CD74AC109M96	SCHS282	CD74AC245SM	SCHS245	CD74AC646M96	SCHS293
CD74AC112E	SCHS233	CD74AC251M	SCHS246	CD74AC652M96	SCHS294
CD74AC112M	SCHS233	CD74AC251M96	SCHS246		
CD74AC112M96	SCHS233	CD74AC253M	SCHS247		
CD74AC138E	SCHS234	CD74AC253M96	SCHS247		
CD74AC138M	SCHS234	CD74AC257E	SCHS248		
CD74AC138M96	SCHS234	CD74AC257MCD74A	SCHS248		
CD74AC139E	SCHS235	C257M96	SCHS248		
CD74AC139M96	SCHS235	CD74AC257SM	SCHS248		

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74ACT00E	SCHS223	CD74ACT151M96	SCHS236	CD74ACT257M96	SCHS248
CD74ACT00M	SCHS223	CD74ACT153E	SCHS237	CD74ACT257SM	SCHS248
CD74ACT00M96	SCHS223	CD74ACT153M	SCHS237	CD74ACT258M	SCHS248
CD74ACT02E	SCHS224	CD74ACT153M96	SCHS237	CD74ACT258M96	SCHS248
CD74ACT02M	SCHS224	CD74ACT157E	SCHS238	CD74ACT273E	SCHS249
CD74ACT02M96	SCHS224	CD74ACT157M	SCHS238	CD74ACT273M	SCHS249
CD74ACT04E	SCHS225	CD74ACT157M96	SCHS238	CD74ACT273M96	SCHS249
CD74ACT04M	SCHS225	CD74ACT158M96	SCHS238	CD74ACT273SM	SCHS249
CD74ACT04M96	SCHS225	CD74ACT161E	SCHS284	CD74ACT280E	SCHS250
CD74ACT05E	SCHS225	CD74ACT161M	SCHS284	CD74ACT280M	SCHS250
CD74ACT05M	SCHS225	CD74ACT161M96	SCHS284	CD74ACT280M96	SCHS250
CD74ACT05M96	SCHS225	CD74ACT163E	SCHS284	CD74ACT283E	SCHS251
CD74ACT08E	SCHS226	CD74ACT163M	SCHS284	CD74ACT283M	SCHS251
CD74ACT08M	SCHS226	CD74ACT163M96	SCHS284	CD74ACT297M	SCHS297A
CD74ACT08M96	SCHS226	CD74ACT164E	SCHS240	CD74ACT299M	SCHS288
CD74ACT10E	SCHS227	CD74ACT164M	SCHS240	CD74ACT299M96	SCHS288
CD74ACT10M	SCHS227	CD74ACT164M96	SCHS240	CD74ACT373E	SCHS289
CD74ACT10M96	SCHS227	CD74ACT174E	SCHS241	CD74ACT373M	SCHS289
CD74ACT14E	SCHS228	CD74ACT174M	SCHS241	CD74ACT373M96	SCHS289
CD74ACT14M	SCHS228	CD74ACT174M96	SCHS241	CD74ACT374E	SCHS290
CD74ACT14M96	SCHS228	CD74ACT175E	SCHS242	CD74ACT374M	SCHS290
CD74ACT20E	SCHS229	CD74ACT175M	SCHS242	CD74ACT374M96	SCHS290
CD74ACT20M	SCHS229	CD74ACT175M96	SCHS242	CD74ACT540E	SCHS285
CD74ACT20M96	SCHS229	CD74ACT238E	SCHS234	CD74ACT540M	SCHS285
CD74ACT32E	SCHS230	CD74ACT240E	SCHS244	CD74ACT540M96	SCHS285
CD74ACT32M	SCHS230	CD74ACT240M	SCHS244	CD74ACT541E	SCHS285
CD74ACT32M96	SCHS230	CD74ACT240M96	SCHS244	CD74ACT541M	SCHS285
CD74ACT74E	SCHS231	CD74ACT241E	SCHS287	CD74ACT541M96	SCHS285
CD74ACT74M	SCHS231	CD74ACT241M96	SCHS287	CD74ACT541SM	SCHS285
CD74ACT74M96	SCHS231	CD74ACT244E	SCHS287	CD74ACT573E	SCHS291
CD74ACT86E	SCHS232	CD74ACT244M	SCHS287	CD74ACT573M	SCHS291
CD74ACT86M	SCHS232	CD74ACT244M96	SCHS287	CD74ACT573M96	SCHS291
CD74ACT86M96	SCHS232	CD74ACT244SM	SCHS287	CD74ACT574E	SCHS292
CD74ACT109E	SCHS233	CD74ACT244SM96	SCHS287	CD74ACT574M	SCHS292
CD74ACT109M	SCHS233	CD74ACT245E	SCHS245	CD74ACT574M96	SCHS292
CD74ACT109M96	SCHS233	CD74ACT245M	SCHS245	CD74ACT623M96	SCHS286
CD74ACT112M	SCHS233	CD74ACT245M96	SCHS245	CD74ACT646M	SCHS286
CD74ACT112M96	SCHS233	CD74ACT245SM	SCHS245	CD74ACT646M96	SCHS286
CD74ACT138E	SCHS234	CD74ACT245SM96	SCHS245	CD74ACT646EN	SCHS286
CD74ACT138M	SCHS234	CD74ACT253E	SCHS247	CD74ACT651M96	SCHS294
CD74ACT138M96	SCHS234	CD74ACT253M	SCHS247	CD74ACT652M	SCHS294
CD74ACT139E	SCHS235	CD74ACT253M96	SCHS247	CD74ACT652M96	SCHS294
CD74ACT139M	SCHS235	CD74ACT257E	SCHS248	CD74ACT652EN	SCHS294
CD74ACT139M96	SCHS235	CD74ACT257M	SCHS248		

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74FCT240E	SCHS253	CD74FCT540M	SCHS257	CD74FCT646SM	SCHS261
CD74FCT240M	SCHS253	CD74FCT540M96	SCHS257	CD74FCT651EN	SCHS262
CD74FCT240M96	SCHS253	CD74FCT541E	SCHS257	CD74FCT651M	SCHS262
CD74FCT240SM	SCHS253	CD74FCT541M	SCHS257	CD74FCT652EN	SCHS262
CD74FCT244E	SCHS253	CD74FCT541M96	SCHS257	CD74FCT652M	SCHS262
CD74FCT244M	SCHS253	CD74FCT541SM	SCHS257	CD74FCT653EN	SCHS263
CD74FCT244M96	SCHS253	CD74FCT543EN	SCHS258	CD74FCT653M	SCHS263
CD74FCT244SM	SCHS253	CD74FCT543M	SCHS258	CD74FCT654EN	SCHS263
CD74FCT244ATE	SCHS253	CD74FCT543M96	SCHS258	CD74FCT821AEN	SCHS264
CD74FCT245E	SCHS271	CD74FCT543SM	SCHS258	CD74FCT821AM	SCHS264
CD74FCT245M	SCHS271	CD74FCT564E	SCHS259	CD74FCT821AM96	SCHS264
CD74FCT245M96	SCHS271	CD74FCT564M	SCHS259	CD74FCT822AEN	SCHS264
CD74FCT245SM	SCHS271	CD74FCT573E	SCHS260A	CD74FCT823AEN	SCHS265
CD74FCT273E	SCHS254	CD74FCT573M	SCHS260A	CD74FCT824AEN	SCHS265
CD74FCT273M	SCHS254	CD74FCT573M96	SCHS260A	CD74FCT841AEN	SCHS266
CD74FCT273M96	SCHS254	CD74FCT573SM	SCHS260A	CD74FCT841AM	SCHS266
CD74FCT2952AM	SCHS295	CD74FCT573SM96	SCHS260A	CD74FCT841AM96	SCHS266
CD74FCT373E	SCHS255	CD74FCT573ATE	SCHS260A	CD74FCT842AM	SCHS266
CD74FCT373M	SCHS255	CD74FCT574E	SCHS259	CD74FCT842AM96	SCHS266
CD74FCT373M96	SCHS255	CD74FCT574M	SCHS259	CD74FCT843AM	SCHS267
CD74FCT373SM	SCHS255	CD74FCT574M96	SCHS259	CD74FCT843AM96	SCHS267
CD74FCT374E	SCHS256	CD74FCT574SM	SCHS259	CD74FCT844AEN	SCHS267
CD74FCT374M	SCHS256	CD74FCT623M	SCHS296	CD74FCT861AM	SCHS268
CD74FCT374M96	SCHS256	CD74FCT646EN	SCHS261	CD74FCT861AM96	SCHS268
CD74FCT374SM	SCHS256	CD74FCT646M	SCHS261	CD74FCT863AM	SCHS269
CD74FCT540E	SCHS257	CD74FCT646M96	SCHS261		

TEXAS INSTRUMENTS

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74HC00E	SCHS116	CD74HC42M	SCHS133	CD74HC139E	SCHS148
CD74HC00M	SCHS116	CD74HC73E	SCHS134	CD74HC139M	SCHS148
CD74HC00M96	SCHS116	CD74HC73M	SCHS134	CD74HC139M96	SCHS148
CD74HC02E	SCHS125	CD74HC74E	SCHS124	CD74HC147E	SCHS149
CD74HC02M	SCHS125	CD74HC74M	SCHS124	CD74HC147M	SCHS149
CD74HC02M96	SCHS125	CD74HC74M96	SCHS124	CD74HC147M96	SCHS149
CD74HC03E	SCHS126	CD74HC75E	SCHS135	CD74HC151E	SCHS150
CD74HC03M	SCHS126	CD74HC75M	SCHS135	CD74HC151M	SCHS150
CD74HC03M96	SCHS126	CD74HC75M96	SCHS135	CD74HC151M96	SCHS150
CD74HC04E	SCHS117	CD74HC85E	SCHS136	CD74HC153E	SCHS151
CD74HC04M	SCHS117	CD74HC85M	SCHS136	CD74HC153M	SCHS151
CD74HC04M96	SCHS117	CD74HC85M96	SCHS136	CD74HC153M96	SCHS151
CD74HCU04E	SCHS127	CD74HC86E	SCHS137	CD74HC154E	SCHS152
CD74HCU04M	SCHS127	CD74HC86M	SCHS137	CD74HC154M	SCHS152
CD74HCU04M96	SCHS127	CD74HC86M96	SCHS137	CD74HC154M96	SCHS152
CD74HC08E	SCHS118	CD74HC93E	SCHS138	CD74HC154EN	SCHS152
CD74HC08M	SCHS118	CD74HC93M	SCHS138	CD74HC157E	SCHS153
CD74HC08M96	SCHS118	CD74HC93M96	SCHS138	CD74HC157M	SCHS153
CD74HC10E	SCHS128	CD74HC107E	SCHS139	CD74HC157M96	SCHS153
CD74HC10M	SCHS128	CD74HC107M	SCHS139	CD74HC157SM	SCHS153
CD74HC10M96	SCHS128	CD74HC107M96	SCHS139	CD74HC158E	SCHS153
CD74HC11E	SCHS273	CD74HC109E	SCHS140	CD74HC158M	SCHS153
CD74HC11M	SCHS273	CD74HC109M	SCHS140	CD74HC161E	SCHS154
CD74HC11M96	SCHS273	CD74HC109M96	SCHS140	CD74HC161M	SCHS154
CD74HC14E	SCHS129	CD74HC112E	SCHS141	CD74HC161M96	SCHS154
CD74HC14M	SCHS129	CD74HC112M96	SCHS141	CD74HC163E	SCHS154
CD74HC14M96	SCHS129	CD74HC123E	SCHS142	CD74HC163M	SCHS154
CD74HC20E	SCHS130	CD74HC123M	SCHS142	CD74HC163M96	SCHS154
CD74HC20M	SCHS130	CD74HC123M96	SCHS142	CD74HC164E	SCHS155
CD74HC20M96	SCHS130	CD74HC125E	SCHS143	CD74HC164M	SCHS155
CD74HC21E	SCHS131	CD74HC125M	SCHS143	CD74HC164M96	SCHS155
CD74HC21M	SCHS131	CD74HC125M96	SCHS143	CD74HC165E	SCHS156
CD74HC21M96	SCHS131	CD74HC126E	SCHS144	CD74HC165M	SCHS156
CD74HC27E	SCHS132	CD74HC126M	SCHS144	CD74HC165M96	SCHS156
CD74HC27M	SCHS132	CD74HC126M96	SCHS144	CD74HC166E	SCHS157
CD74HC27M96	SCHS132	CD74HC132E	SCHS145	CD74HC166M	SCHS157
CD74HC30E	SCHS121	CD74HC132M	SCHS145	CD74HC166M96	SCHS157
CD74HC30M	SCHS121	CD74HC132M96	SCHS145	CD74HC173E	SCHS158
CD74HC30M96	SCHS121	CD74HC137E	SCHS146	CD74HC173M	SCHS158
CD74HC32E	SCHS274	CD74HC138E	SCHS147A	CD74HC173M96	SCHS158
CD74HC32M	SCHS274	CD74HC138M	SCHS147A	CD74HC174E	SCHS159
CD74HC32M96	SCHS274	CD74HC138M96	SCHS147A	CD74HC174M	SCHS159
CD74HC42E	SCHS133	CD74HC138SM	SCHS147A	CD74HC174M96	SCHS159

TEXAS INSTRUMENTS

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74HC175E	SCHS160	CD74HC253E	SCHS170	CD74HC390E	SCHS185
CD74HC175M	SCHS160	CD74HC253M	SCHS170	CD74HC390M	SCHS185
CD74HC175M96	SCHS160	CD74HC257E	SCHS171	CD74HC390M96	SCHS185
CD74HC190E	SCHS275	CD74HC257M	SCHS171	CD74HC393E	SCHS186
CD74HC191E	SCHS162	CD74HC257M96	SCHS171	CD74HC393M	SCHS186
CD74HC191M	SCHS162	CD74HC258M	SCHS276	CD74HC393M96	SCHS186
CD74HC191M96	SCHS162	CD74HC259E	SCHS173	CD74HC423E	SCHS142
CD74HC192E	SCHS163	CD74HC259M	SCHS173	CD74HC423M	SCHS142
CD74HC193E	SCHS163	CD74HC259M96	SCHS173	CD74HC533E	SCHS187
CD74HC193M	SCHS163	CD74HC273E	SCHS174	CD74HC534E	SCHS188
CD74HC193M96	SCHS163	CD74HC273M	SCHS174	CD74HC540E	SCHS189
CD74HC194E	SCHS164	CD74HC273M96	SCHS174	CD74HC540M	SCHS189
CD74HC194M	SCHS164	CD74HC273SM	SCHS174	CD74HC540M96	SCHS189
CD74HC194M96	SCHS164	CD74HC280E	SCHS175	CD74HC541E	SCHS189
CD74HC195E	SCHS165	CD74HC280M96	SCHS175	CD74HC541M	SCHS189
CD74HC195M	SCHS165	CD74HC283E	SCHS176	CD74HC541M96	SCHS189
CD74HC221E	SCHS166A	CD74HC283M	SCHS176	CD74HC541SM	SCHS189
CD74HC221M	SCHS166A	CD74HC283M96	SCHS176	CD74HC563E	SCHS187
CD74HC221M96	SCHS166A	CD74HC297E	SCHS177	CD74HC563M	SCHS187
CD74HC237E	SCHS146	CD74HC299E	SCHS178	CD74HC564E	SCHS188
CD74HC237M	SCHS146	CD74HC299M	SCHS178	CD74HC564M	SCHS188
CD74HC237M96	SCHS146	CD74HC299M96	SCHS178	CD74HC573E	SCHS182
CD74HC238E	SCHS147A	CD74HC354E	SCHS179	CD74HC573M	SCHS182
CD74HC238M	SCHS147A	CD74HC365E	SCHS180	CD74HC573M96	SCHS182
CD74HC238M96	SCHS147A	CD74HC365M	SCHS180	CD74HC574E	SCHS183
CD74HC240E	SCHS167	CD74HC365M96	SCHS180	CD74HC574M	SCHS183
CD74HC240M	SCHS167	CD74HC366E	SCHS180	CD74HC574M96	SCHS183
CD74HC240M96	SCHS167	CD74HC366M	SCHS180	CD74HC597E	SCHS191
CD74HC241E	SCHS167	CD74HC367E	SCHS181	CD74HC597M	SCHS191
CD74HC241M	SCHS167	CD74HC367M	SCHS181	CD74HC597M96	SCHS191
CD74HC241M96	SCHS167	CD74HC367M96	SCHS181	CD74HC640E	SCHS192
CD74HC243E	SCHS168	CD74HC368E	SCHS181	CD74HC640M	SCHS192
CD74HC243M	SCHS168	CD74HC368M	SCHS181	CD74HC646M	SCHS193
CD74HC243M96	SCHS168	CD74HC368M96	SCHS181	CD74HC646M96	SCHS193
CD74HC244E	SCHS167	CD74HC373E	SCHS182	CD74HC646EN	SCHS193
CD74HC244M	SCHS167	CD74HC373M	SCHS182	CD74HC652EN	SCHS194
CD74HC244M96	SCHS167	CD74HC373M96	SCHS182	CD74HC670E	SCHS195
CD74HC245E	SCHS119	CD74HC374E	SCHS183	CD74HC670M	SCHS195
CD74HC245M	SCHS119	CD74HC374M	SCHS183	CD74HC670M96	SCHS195
CD74HC245M96	SCHS119	CD74HC374M96	SCHS183	CD74HC688E	SCHS196
CD74HC251E	SCHS169	CD74HC377E	SCHS184	CD74HC688M	SCHS196
CD74HC251M	SCHS169	CD74HC377M	SCHS184	CD74HC688M96	SCHS196
CD74HC251M96	SCHS169	CD74HC377M96	SCHS184	CD74HC4002E	SCHS197

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74HC4002M	SCHS197	CD74HC4052M96	SCHS122A	CD74HC4511M	SCHS214
CD74HC4002M96	SCHS197	CD74HC4052SM	SCHS122A	CD74HC4514E	SCHS215
CD74HC4015E	SCHS198	CD74HC4053E	SCHS122A	CD74HC4514M	SCHS215
CD74HC4015M	SCHS198	CD74HC4053M	SCHS122A	CD74HC4514M96	SCHS215
CD74HC4016E	SCHS199	CD74HC4053M96	SCHS122A	CD74HC4514EN	SCHS215
CD74HC4016M96	SCHS199	CD74HC4059E	SCHS206	CD74HC4515E	SCHS215
CD74HC4017E	SCHS200	CD74HC4059M96	SCHS206	CD74HC4515M	SCHS215
CD74HC4017M	SCHS200	CD74HC4060E	SCHS207	CD74HC4515M96	SCHS215
CD74HC4017M96	SCHS200	CD74HC4060M	SCHS207	CD74HC4515EN	SCHS215
CD74HC4020E	SCHS201	CD74HC4060M96	SCHS207	CD74HC4518E	SCHS216
CD74HC4020M	SCHS201	CD74HC4066E	SCHS208	CD74HC4520E	SCHS216
CD74HC4020M96	SCHS201	CD74HC4066M	SCHS208	CD74HC4520M	SCHS216
CD74HC4024E	SCHS202	CD74HC4066M96	SCHS208	CD74HC4520M96	SCHS216
CD74HC4024M	SCHS202	CD74HC4067E	SCHS209	CD74HC4538E	SCHS123
CD74HC4024M96	SCHS202	CD74HC4067M	SCHS209	CD74HC4538M	SCHS123
CD74HC4040E	SCHS203	CD74HC4067M96	SCHS209	CD74HC4538M96	SCHS123
CD74HC4040M	SCHS203	CD74HC4075E	SCHS210	CD74HC4543E	SCHS219
CD74HC4040M96	SCHS203	CD74HC4075M	SCHS210	CD74HC7046AE	SCHS218
CD74HC4046AE	SCHS204	CD74HC4075M96	SCHS210	CD74HC7046AM	SCHS218
CD74HC4046AM	SCHS204	CD74HC4094E	SCHS211	CD74HC7046AM96	SCHS218
CD74HC4046AM96	SCHS204	CD74HC4094M	SCHS211	CD74HC7266E	SCHS219
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CD74HC4049M	SCHS205	CD74HC4316E	SCHS212	CD74HC7266M96	SCHS219
CD74HC4049M96	SCHS205	CD74HC4316M	SCHS212	CD74HC40103E	SCHS221
CD74HC4050E	SCHS205	CD74HC4316M96	SCHS212	CD74HC40103M	SCHS221
CD74HC4050M	SCHS205	CD74HC4351E	SCHS213	CD74HC40103M96	SCHS221
CD74HC4050M96	SCHS205	CD74HC4351M	SCHS213	CD74HC40105E	SCHS222
CD74HC4051E	SCHS122A	CD74HC4352E	SCHS213	CD74HC40105M	SCHS222
CD74HC4051M	SCHS122A	CD74HC4511E	SCHS214	CD74HC40105M96	SCHS222
CD74HC4051M96	SCHS122A				
CD74HC4052E	SCHS122A				
CD74HC4052M	SCHS122A				

TEXAS INSTRUMENTS

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74HCT00E	SCHS116	CD74HCT74M	SCHS124	CD74HCT154M	SCHS152
CD74HCT00M	SCHS116	CD74HCT74M96	SCHS124	CD74HCT154EN	SCHS152
CD74HCT00M96	SCHS116	CD74HCT75E	SCHS135	CD74HCT157E	SCHS153
CD74HCT02E	SCHS125	CD74HCT75M	SCHS135	CD74HCT157M	SCHS153
CD74HCT02M	SCHS125	CD74HCT85E	SCHS136	CD74HCT157M96	SCHS153
CD74HCT02M96	SCHS125	CD74HCT85M	SCHS136	CD74HCT158E	SCHS153
CD74HCT03E	SCHS126	CD74HCT86E	SCHS137	CD74HCT161E	SCHS154
CD74HCT03M	SCHS126	CD74HCT86M	SCHS137	CD74HCT161M	SCHS154
CD74HCT03M96	SCHS126	CD74HCT86M96	SCHS137	CD74HCT161M96	SCHS154
CD74HCT04E	SCHS117	CD74HCT93E	SCHS138	CD74HCT163E	SCHS154
CD74HCT04M	SCHS117	CD74HCT107E	SCHS139	CD74HCT163M	SCHS154
CD74HCT04M96	SCHS117	CD74HCT109E	SCHS140	CD74HCT163M96	SCHS154
CD74HCT08E	SCHS118	CD74HCT109M	SCHS140	CD74HCT164E	SCHS155
CD74HCT08M	SCHS118	CD74HCT109M96	SCHS140	CD74HCT164M	SCHS155
CD74HCT08M96	SCHS118	CD74HCT112E	SCHS141	CD74HCT164M96	SCHS155
CD74HCT10E	SCHS128	CD74HCT123E	SCHS142	CD74HCT165E	SCHS156
CD74HCT10M	SCHS128	CD74HCT123M	SCHS142	CD74HCT165M	SCHS156
CD74HCT10M96	SCHS128	CD74HCT123M96	SCHS142	CD74HCT165M96	SCHS156
CD74HCT11E	SCHS273	CD74HCT125E	SCHS143	CD74HCT166E	SCHS157
CD74HCT11M	SCHS273	CD74HCT125M	SCHS143	CD74HCT166M	SCHS157
CD74HCT11M96	SCHS273	CD74HCT125M96	SCHS143	CD74HCT166M96	SCHS157
CD74HCT14E	SCHS129	CD74HCT126E	SCHS144	CD74HCT173E	SCHS158
CD74HCT14M	SCHS129	CD74HCT126M	SCHS144	CD74HCT173M	SCHS158
CD74HCT14M96	SCHS129	CD74HCT126M96	SCHS144	CD74HCT173M96	SCHS158
CD74HCT20E	SCHS130	CD74HCT132E	SCHS145	CD74HCT174E	SCHS159
CD74HCT20M	SCHS130	CD74HCT132M	SCHS145	CD74HCT174M	SCHS159
CD74HCT20M96	SCHS130	CD74HCT132M96	SCHS145	CD74HCT174M96	SCHS159
CD74HCT21E	SCHS131	CD74HCT137E	SCHS146	CD74HCT175E	SCHS160
CD74HCT21M	SCHS131	CD74HCT137M96	SCHS146	CD74HCT175M	SCHS160
CD74HCT21M96	SCHS131	CD74HCT138E	SCHS147A	CD74HCT175M96	SCHS160
CD74HCT27E	SCHS132	CD74HCT138M	SCHS147A	CD74HCT191E	SCHS162
CD74HCT27M	SCHS132	CD74HCT138M96	SCHS147A	CD74HCT191M	SCHS162
CD74HCT27M96	SCHS132	CD74HCT139E	SCHS148	CD74HCT193E	SCHS163
CD74HCT30E	SCHS121	CD74HCT139M	SCHS148	CD74HCT194E	SCHS164
CD74HCT30M	SCHS121	CD74HCT139M96	SCHS148	CD74HCT221E	SCHS166A
CD74HCT30M96	SCHS121	CD74HCT147E	SCHS149	CD74HCT221M	SCHS166A
CD74HCT32E	SCHS274	CD74HCT151E	SCHS150	CD74HCT221M96	SCHS166A
CD74HCT32M	SCHS274	CD74HCT151M	SCHS150	CD74HCT237E	SCHS146
CD74HCT32M96	SCHS274	CD74HCT151M96	SCHS150	CD74HCT238E	SCHS147A
CD74HCT42E	SCHS133	CD74HCT153E	SCHS151	CD74HCT238M	SCHS147A
CD74HCT73E	SCHS134	CD74HCT153M	SCHS151	CD74HCT240E	SCHS167
CD74HCT73M	SCHS134	CD74HCT153M96	SCHS151	CD74HCT240M	SCHS167
CD74HCT74E	SCHS124	CD74HCT154E	SCHS152	CD74HCT240M96	SCHS167

TEXAS INSTRUMENTS

DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74HCT241E	SCHS167	CD74HCT368M	SCHS181	CD74HCT652M	SCHS194
CD74HCT241M96	SCHS167	CD74HCT368M96	SCHS181	CD74HCT652M96	SCHS194
CD74HCT243E	SCHS168	CD74HCT373E	SCHS182	CD74HCT670E	SCHS195
CD74HCT243M	SCHS168	CD74HCT373M	SCHS182	CD74HCT670M	SCHS195
CD74HCT244E	SCHS167	CD74HCT373M96	SCHS182	CD74HCT670M96	SCHS195
CD74HCT244M	SCHS167	CD74HCT374E	SCHS183	CD74HCT688E	SCHS196
CD74HCT244M96	SCHS167	CD74HCT374M	SCHS183	CD74HCT688M	SCHS196
CD74HCT245E	SCHS119	CD74HCT374M96	SCHS183	CD74HCT688M96	SCHS196
CD74HCT245M	SCHS119	CD74HCT377E	SCHS184	CD74HCT4020E	SCHS201
CD74HCT245M96	SCHS119	CD74HCT377M	SCHS184	CD74HCT4020M	SCHS201
CD74HCT251E	SCHS169	CD74HCT377M96	SCHS184	CD74HCT4020M96	SCHS201
CD74HCT251M	SCHS169	CD74HCT390E	SCHS185	CD74HCT4024M	SCHS202
CD74HCT251M96	SCHS169	CD74HCT390M	SCHS185	CD74HCT4040E	SCHS203
CD74HCT253E	SCHS170	CD74HCT390M96	SCHS185	CD74HCT4040M	SCHS203
CD74HCT253M	SCHS170	CD74HCT393E	SCHS186	CD74HCT4040M96	SCHS203
CD74HCT253M96	SCHS170	CD74HCT393M	SCHS186	CD74HCT4046AE	SCHS204
CD74HCT257E	SCHS171	CD74HCT393M96	SCHS186	CD74HCT4046AM	SCHS204
CD74HCT257M	SCHS171	CD74HCT423E	SCHS142	CD74HCT4046AM96	SCHS204
CD74HCT257M96	SCHS171	CD74HCT423M96	SCHS142	CD74HCT4051E	SCHS122A
CD74HCT258E	SCHS172	CD74HCT533E	SCHS187	CD74HCT4051M	SCHS122A
CD74HCT259E	SCHS173	CD74HCT534E	SCHS188	CD74HCT4052E	SCHS122A
CD74HCT259M	SCHS173	CD74HCT540E	SCHS189	CD74HCT4052M	SCHS122A
CD74HCT259M96	SCHS173	CD74HCT540M	SCHS189	CD74HCT4052M96	SCHS122A
CD74HCT273E	SCHS174	CD74HCT540M96	SCHS189	CD74HCT4053E	SCHS122A
CD74HCT273M	SCHS174	CD74HCT541E	SCHS189	CD74HCT4053M	SCHS122A
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CD74HCT280E	SCHS175	CD74HCT541M96	SCHS189	CD74HCT4060E	SCHS207
CD74HCT283E	SCHS176	CD74HCT563E	SCHS187	CD74HCT4060M	SCHS207
CD74HCT283M	SCHS176	CD74HCT563M	SCHS187	CD74HCT4060M96	SCHS207
CD74HCT283M96	SCHS176	CD74HCT564E	SCHS188	CD74HCT4066E	SCHS208
CD74HCT297E	SCHS177	CD74HCT564M	SCHS188	CD74HCT4066M	SCHS208
CD74HCT299E	SCHS178	CD74HCT573E	SCHS182	CD74HCT4066M96	SCHS208
CD74HCT299M	SCHS178	CD74HCT573M	SCHS182	CD74HCT4067M	SCHS209
CD74HCT354E	SCHS179	CD74HCT573M96	SCHS182	CD74HCT4075E	SCHS210
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CD74HCT356M96	SCHS277	CD74HCT574M	SCHS183	CD74HCT4094M	SCHS211
CD74HCT365E	SCHS180	CD74HCT574M96	SCHS183	CD74HCT4094M96	SCHS211
CD74HCT365M	SCHS180	CD74HCT597E	SCHS191	CD74HCT4316E	SCHS212
CD74HCT365M96	SCHS180	CD74HCT597M	SCHS191	CD74HCT4316M	SCHS212
CD74HCT367E	SCHS181	CD74HCT597M96	SCHS191	CD74HCT4316M96	SCHS212
CD74HCT367M	SCHS181	CD74HCT640E	SCHS192	CD74HCT4351E	SCHS213
CD74HCT367M96	SCHS181	CD74HCT640M	SCHS192	CD74HCT4511E	SCHS279
CD74HCT368E	SCHS181	CD74HCT646M96	SCHS278	CD74HCT4514E	SCHS280

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DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE	DEVICE	LITERATURE REFERENCE
CD74HCT4520E	SCHS216	CD74HCT4543E	SCHS281	CD74HCT40103M96	SCHS221
CD74HCT4520M	SCHS216	CD74HCT7046AE	SCHS218	CD74HCT40105E	SCHS222
CD74HCT4520M96	SCHS216	CD74HCT7046AM	SCHS218	CD74HCT40105M	SCHS222
CD74HCT4538E	SCHS123	CD74HCT7046AM96	SCHS218	CD74HCT40105M96	SCHS222
CD74HCT4538M	SCHS123	CD74HCT40103E	SCHS221		
CD74HCT4538M96	SCHS123	CD74HCT40103M	SCHS221		

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