PIC16C6X

8-Bit CMOS Microcontrollers

Devices included in this data sheet:

- PIC16C61
- PIC16C62
- PIC16C62A
- PIC16CR62
- PIC16C63
- PIC16CR63
- PIC16C64
- PIC16C64A
- PIC16CR64
- PIC16C65
- PIC16C65A
- PIC16CR65
- PIC16C66
- PIC16C67

PIC16C6X Microcontroller Core Features:

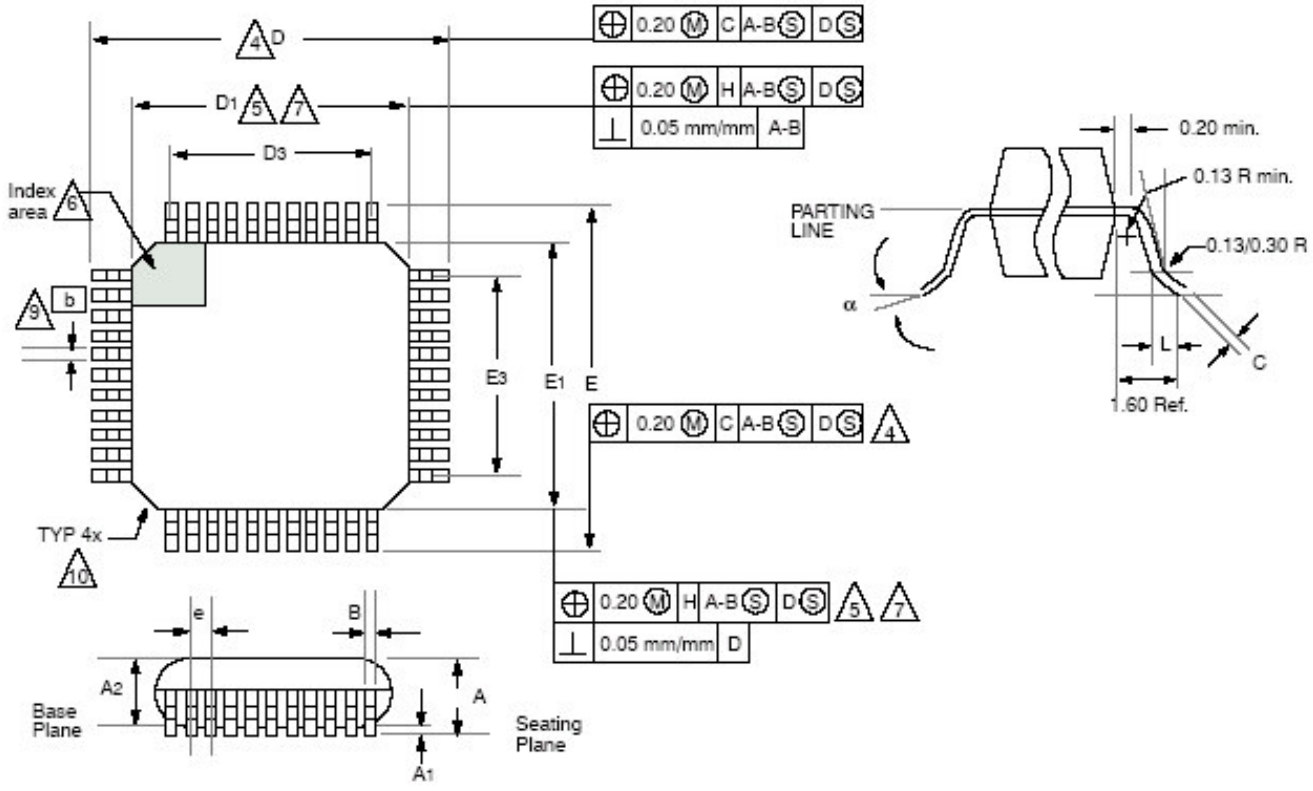
- High performance RISC CPU
- Only 35 single word instructions to learn
- All single cycle instructions except for program branches which are two-cycle
- Operating speed: DC - 20 MHz clock input
  DC - 200 ns instruction cycle
- Interrupt capability
- Eight level deep hardware stack
- Direct, indirect, and relative addressing modes
- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code-protection
- Power saving SLEEP mode
- Selectable oscillator options
- Low-power, high-speed CMOS EPROM/ROM technology
- Fully static design
- Wide operating voltage range: 2.5V to 6.0V
- Commercial, Industrial, and Extended temperature ranges
- Low-power consumption:
  - < 2 mA @ 5V, 4 MHz
  - 15 µA typical @ 3V, 32 kHz
  - < 1 µA typical standby current

PIC16C6X Peripheral Features:

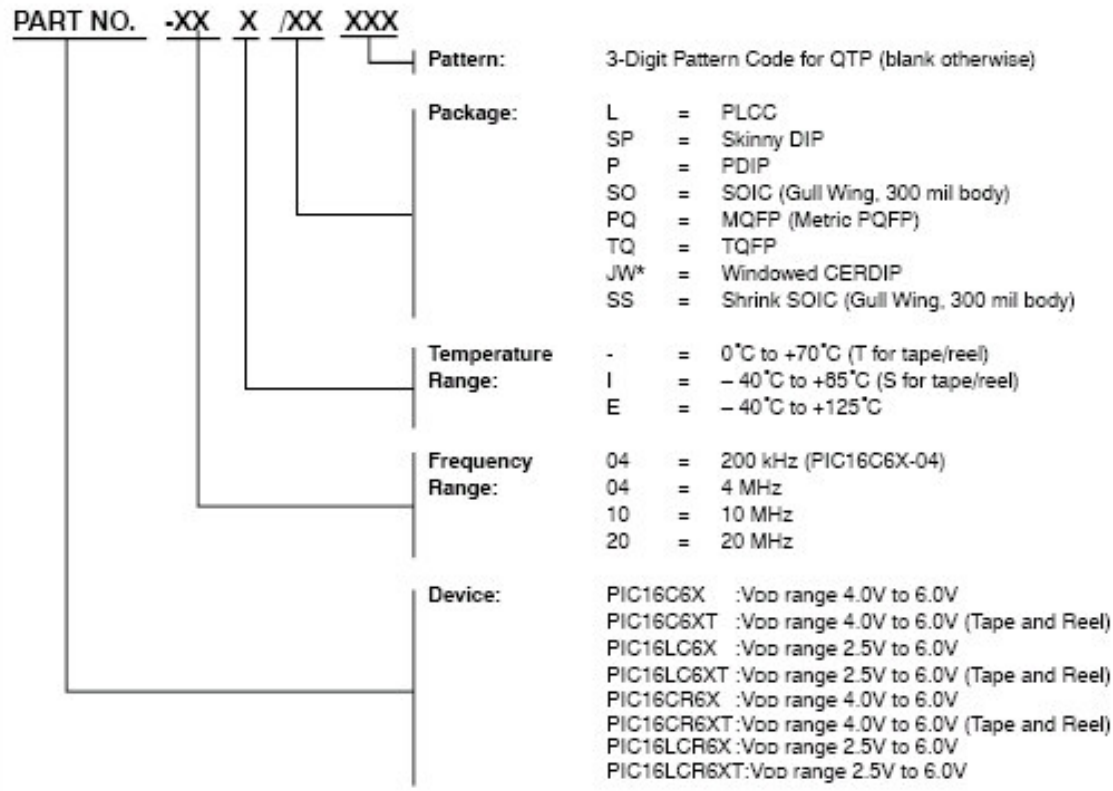
- Timer0: 8-bit timer/counter with 8-bit prescaler
- Timer1: 16-bit timer/counter with prescaler, can be incremented during sleep via external crystal/clock
- Timer2: 8-bit timer/counter with 8-bit period register, prescaler and postscaler
- Capture/Compare/PWM (CCP) module(s)
- Capture is 16-bit, max resolution is 12.5 ns, Compare is 16-bit, max resolution is 200 ns, PWM max resolution is 10-bit.
- Synchronous Serial Port (SSP) with SPI™ and I²C™
- Universal Synchronous Asynchronous Receiver Transmitter (USART/SCI)
- Parallel Slave Port (PSP) 8-bits wide, with external $\overline{RD}$, $\overline{WR}$ and $\overline{CS}$ controls
- Brown-out detection circuitry for Brown-out Reset (BOR)

PIC16C6X Features	61	62	62A	R62	63	R63	64	64A	R64	65	65A	R65	66	67
Program Memory (EPROM) x 14	1K	2K	2K	—	4K	—	2K	2K	—	4K	4K	—	8K	8K
(ROM) x 14	—	—	—	2K	—	4K	—	—	2K	—	—	4K	—	—
Data Memory (Bytes) x 8	36	128	128	128	192	192	128	128	128	192	192	192	368	368
I/O Pins	13	22	22	22	22	22	33	33	33	33	33	33	22	33
Parallel Slave Port	—	—	—	—	—	—	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes
Capture/Compare/PWM Module(s)	—	1	1	1	2	2	1	1	1	2	2	2	2	2
Timer Modules	1	3	3	3	3	3	3	3	3	3	3	3	3	3
Serial Communication	—	SPI/ I²C	SPI/ I²C	SPI/ I²C	SPI/I²C, USART	SPI/I²C, USART	SPI/ I²C	SPI/ I²C	SPI/ I²C	SPI/I²C, USART	SPI/I²C, USART	SPI/I²C, USART	SPI/I²C, USART	SPI/I²C, USART
In-Circuit Serial Programming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brown-out Reset	—	—	Yes	Yes	Yes	Yes	—	Yes	Yes	—	Yes	Yes	Yes	Yes
Interrupt Sources	3	7	7	7	10	10	8	8	8	11	11	11	10	11
Sink/Source Current (mA)	25/20	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25

25.12 44-Lead Plastic Surface Mount (MQFP 10x10 mm Body 1.6/0.15 mm Lead Form) (PQ)



Package Group: Plastic MQFP						
	Millimeters			Inches		
Symbol	Min	Max	Notes	Min	Max	Notes
α	0°	7°		0°	7°	
A	2.000	2.350		0.078	0.093	
A1	0.050	0.250		0.002	0.010	
A2	1.950	2.100		0.768	0.083	
b	0.300	0.450	Typical	0.011	0.018	Typical
C	0.150	0.180		0.006	0.007	
D	12.950	13.450		0.510	0.530	
D1	9.900	10.100		0.390	0.398	
D3	8.000	8.000	Reference	0.315	0.315	Reference
E	12.950	13.450		0.510	0.530	
E1	9.900	10.100		0.390	0.398	
E3	8.000	8.000	Reference	0.315	0.315	Reference
e	0.800	0.800		0.031	0.032	
L	0.730	1.030		0.028	0.041	
N	44	44		44	44	
CP	0.102	–		0.004	–	



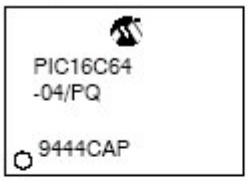
Examples:

a)PIC16C62A - 04/P 301 = Commercial temp., PDIP package, 4 MHz, normal VDD limits, QTP pattern #301
b)PIC16LC65A - 04I/PQ = Industrial temp., MQFP package, 4 MHz, extended VDD limits
c)PIC16C67 - 10E/P = Extended temp., PDIP package, 10 MHz, normal VDD limits

* JW Devices are UV erasable and can be programmed to any device configuration. JW Devices meet the electrical requirement of each oscillator type (including LC devices).

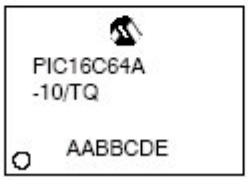
44-Lead MQFP

Example



44-Lead TQFP

Example



Legend:	MM...M	Microchip part number information
	XX...X	Customer specific information*
	AA	Year code (last 2 digits of calender year)
	BB	Week code (week of January 1 is week '01')
	C	Facility code of the plant at which wafer is manufactured. C = Chandler, Arizona, U.S.A. S = Tempe, Arizona, U.S.A.
	D_1	Mask revision number for microcontroller
	E	Assembly code of the plant or country of origin in which part was assembled.
Note:	In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line thus limiting the number of available characters for customer specific information.	

* Standard OTP marking consists of Microchip part number, year code, week code, facility code, mask revision number, and assembly code. For OTP marking beyond this, certain price adders apply. Please check with your Microchip Sales Office. For QTP devices, any special marking adders are included in QTP price.