

CRYSTAL OSCILLATOR SPXO

SG-645 / SG-636 series

- Frequency range : 2.21675 MHz to 135 MHz
- Supply voltage : 2.5 V / 3.3 V / 5.0 V
- Function : Output enable(OE) Standby($\overline{ST}$)
- Thickness : SG-645:1.5 mm Max.
SG-636:2.7 mm Max.



Actual size

SG-645 series



SG-636 series



Specifications (characteristics)

Item		Symbol	Specifications				Remarks
			SG-636 PTF	SG-636 PH	SG-636 PCE SG-636 SCE	SG-636 PDE	
Output frequency range		f ₀	2.21675 MHz to 41.000 MHz	41.001 MHz to 70.000 MHz	2.21675 MHz to 40.000 MHz	2.21675 MHz to 40.000 MHz	
Supply voltage		V _{cc}	5.0 V ±0.5 V		3.3 V ±0.3 V	2.5 V ±0.25 V	
Temperature range	Storage temperature	T _{stg}	-55 °C to +100 °C				Store as bare product after unpacking
	Operating temperature	T _{use}	-20 °C to +70 °C				
Frequency tolerance		F _{tol(osc)}	C: ±100 × 10 ⁻⁶				-20 °C to +70 °C
Current consumption		I _{cc}	17 mA Max.	35 mA Max.	9 mA Max.	5 mA Max.	No load condition
Output disable current		I _{dis}	10 mA Max.	20 mA Max.	5 mA Max.	3 mA Max.	OE=GND
Stand-by current		I _{std}	—		2 μA Max.	—	ST =GND(SCE)
Symmetry		SYM	40 % to 60 %		45 % to 55 %		CMOS load:50 % V _{cc} level
			45 % to 55 %	—		TTL load: 1.4 V level	
High output voltage		V _{OH}	V _{cc} -0.4 V Min.				I _{OH} = -8 mA(PTF)/-4 mA(PH,SCE,PCE), /-3.2 mA(PDE)
Low output voltage		V _{OL}	0.4 V Max.				I _{OL} =16 mA(PTF)/4mA(PH,SCE,PCE) /3.2 mA(PDE)
Output load condition (TTL)		L _{TTL}	10 TTL Max.	—			L _{CMOS} ≤ 15 pF
Output load condition (CMOS)		L _{CMOS}	50 pF Max.	20 pF Max.(≤55 MHz) 15 pF Max.(>55 MHz)	30 pF Max.	15 pF Max.	
Output enable / disable input voltage		V _{IH}	2.0 V Min.		80 % V _{cc} Min.		OE Terminal, ST Terminal (SCE)
		V _{IL}	0.8 V Max.		20 % V _{cc} Max.		
Output rise and fall time		tr / tf	7 ns Max.	5 ns Max.			CMOS load:20 % V _{cc} to 80 % V _{cc} level
			5 ns Max.	—			TTL load:0.4 V to 2.4 V level
Oscillation start up time		t _{osc}	4 ms Max.	10 ms Max.	4 ms Max.		Time at minimum supply voltage to be 0 s
Frequency aging		F _{aging}	±5 × 10 ⁻⁶ / year Max.				+25 °C, V _{cc} =5.0 V/3.3 V/2.5 V, First year

Specifications (characteristics)

Item		Symbol	Specifications			Remarks
			SG-636 PTG	SG-636 PHG	SG-636 PCG SG-636 SCG	
Output frequency range		f ₀	2.21675 MHz to 33.000 MHz *1			
Supply voltage		V _{cc}	4.5 V to 5.5 V		2.7 V to 3.6 V	
Temperature range	Storage temperature	T _{stg}	-55 °C to +100 °C			Store as bare product after unpacking
	Operating temperature	T _{use}	-20 °C to +70 °C			
Frequency tolerance		F _{tol(osc)}	B: ±50 × 10 ⁻⁶ C: ±100 × 10 ⁻⁶			-20 °C to +70 °C
Current consumption		I _{cc}	25 mA Max.		12 mA Max.	No load condition
Output disable current		I _{dis}	20 mA Max.		10 mA Max.	OE=GND (PTG,PHG,PCG)
Stand-by current		I _{std}	—		50 μA Max.	ST =GND (SCG)
Symmetry	SYM	—		45 % to 55 %		50 % V _{cc} level, L _{CMOS} =25 pF 1.4 V level, L _{CMOS} =25 pF
		40 % to 60 %		—		
High output voltage	V _{OH}	2.4 V Min.		—	V _{cc} -0.4 V Min.	I _{OH} =-8 mA
		—		V _{cc} -0.4 V Min.		I _{OH} =-16 mA
Low output voltage	V _{OL}	—		—	0.4 V Max.	I _{OL} =8 mA
		0.4 V Max.		—	—	I _{OL} =16 mA
Output load condition		L _{CMOS}	25 pF Max.			
Output enable / disable input voltage	V _{IH}	2.0 V Min.		70 % V _{cc} Min.		OE Terminal , ST Terminal
	V _{IL}	0.8 V Max.		20 % V _{cc} Max.		
Output rise and fall time	t _r / t _f	—		3.4 ns Max.		20 % V _{cc} to 80 % V _{cc} level, L _{CMOS} ≤ 25 pF TTL load:0.4 V to 2.4 V level, L _{CMOS} ≤ 25 pF
		2.4 ns Max.		—		
Oscillation start up time		t _{osc}	12 ms Max.			t=0 at 90 % V _{cc}
Frequency aging		F _{aging}	±5 × 10 ⁻⁶ / year Max.			+25 °C, V _{cc} =5.0 V/ 3.3 V, First year

*1 4.1250 MHz < f_0 < 4.4336 MHz, 8.2500 MHz < f_0 < 8.8672 MHz, 16.500 MHz < f_0 < 17.7344 MHz : Unavailable

Specifications (characteristics)

Item		Symbol	Specifications			Remarks
			SG-636 PTW / STW SG-645 PTW / STW	SG-636 PHW / SHW SG-645 PHW / SHW	SG-636 PCW / SCW SG-645 PCW / SCW	
Output frequency range		f ₀	32.001 MHz to 135.000 MHz			
Supply voltage		V _{cc}	5.0 V ±0.5 V		3.3 V ±0.3 V	
Temperature range	Storage temperature	T _{stg}	SG-636P**-55 °C to +100 °C / SG-645P**-55 °C to +125 °C			Store as bare product after unpacking
	Operating temperature	T _{use}	-20 °C to +70 °C			
			—			-40 °C to +85 °C
Frequency tolerance		F _{tol(osc)}	B: ±50 × 10 ⁻⁶ C: ±100 × 10 ⁻⁶			SG-645PCW / SCW Only
						-20 °C to +70 °C *1
						M: ±50 × 10 ⁻⁶
Current consumption		I _{cc}	45 mA Max.		28 mA Max.	-40 °C to +85 °C : SG-645PCW / SCW Only
Output disable current		I _{dis}	30 mA Max.		16 mA Max.	No load condition(Max. frequency range)
Stand-by current		I _{std}	50 μA Max.			OE=GND (PTW,PHW,PCW) ST =GND (STW,SHW,SCW)
Symmetry		SYM	—		40 % to 60 %	50 % V _{cc} level, L _{CMOS} =Max.
			40 % to 60 %		—	1.4 V level, L _{CMOS} =Max.
High output voltage		V _{OH}	V _{cc} -0.4 V Min.			I _{OH} =-16 mA(PTW , STW , PHW , SHW) /-8 mA(PCW , SCW)
Low output voltage		V _{OL}	0.4 V Max.			I _{OL} = 16 mA(PTW , STW , PHW , SHW) / 8 mA(PCW , SCW)
Output load condition (TTL)		L _{TTL}	5 TTL Max.	—	—	f ₀ ≤ 90 MHz, Max.Supply voltage.
Output load condition (CMOS)		L _{CMOS}	15 pF Max.			Max.frequency, Max.Supply voltage.
Output enable /		V _{IH}	2.0 V Min.		70 % V _{cc} Min.	OE Terminal , ST Terminal
disable input voltage		V _{IL}	0.8 V Max.		20 % V _{cc} Max.	
Output rise and fall time		tr / tr	—		4 ns Max.	20 % V _{cc} to 80 % V _{cc} level, L _{CMOS} ≤ Max. 0.4 V to 2.4 V level
			4 ns Max.		—	
Oscillation start up time		t _{osc}	10 ms Max.			Time at minimum supply voltage to be 0 s
Frequency aging		F _{aging}	±5 × 10 ⁻⁶ / year Max.			+25 °C, V _{cc} =5.0 V / 3.3 V, First year

*1 SG-636 series "C" tolerance : 40 MHz< f_0 <135 MHz

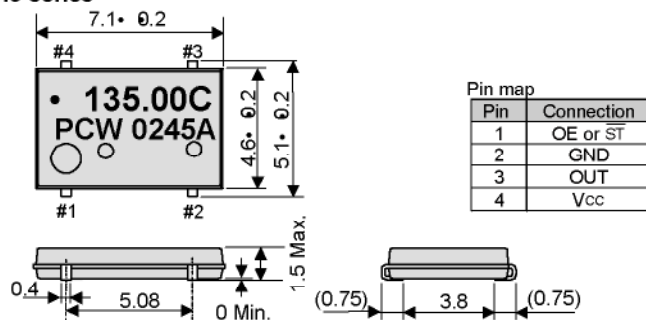
External dimensions

(Unit:mm)

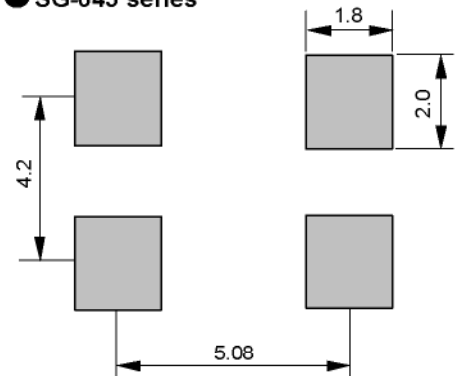
Footprint (Recommended)

(Unit:mm)

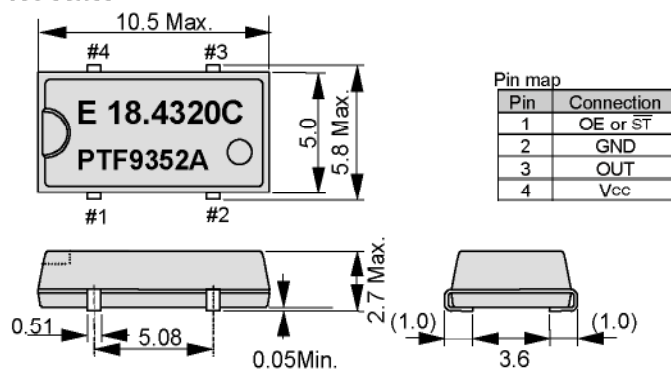
● SG-645 series



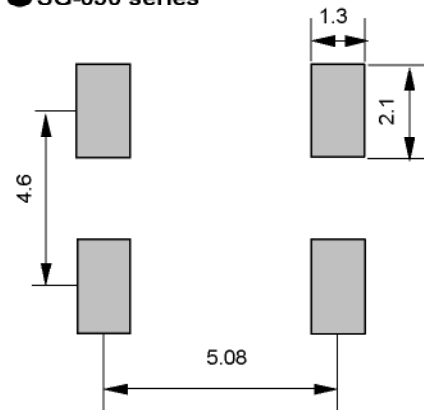
● SG-645 series



● SG-636 series



● SG-636 series



Metal may be exposed on the top or bottom of this product.
This will not affect any quality, reliability or electrical spec.

Note.

OE pin (PTF,PH,PCE,PDE,PTW,PHW,PCW,PTG,PHG,PCG)

OE pin = "H" or "open" : Specified frequency output.

OE pin = "L" : Output is high impedance.

 $\overline{ST}$ pin (STW, SHW, SCW,SCG) $\overline{ST}$ pin = "H" or "open" : Specified frequency output. $\overline{ST}$ pin = "L" : Output is low level (weak pull - down),oscillation stops. $\overline{ST}$ pin (SCE) $\overline{ST}$ pin = "H" or "open" : Specified frequency output. $\overline{ST}$ pin = "L" : Output is low level ,oscillation stops.