



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($\bar{S}T$)
- 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 \pm 0.5 V		3.3 V \pm 0.3 V	2.5 V \pm 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: $\pm 100 \times 10^{-6}$				-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 μ A Max.	—	$\bar{S}T$ =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.	—			$L_{CMOS} \leq 15$ 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, $\bar{S}T$ Terminal (SCE)
	V_{IL}	0.8 V Max.		20 % V_{CC} Max.		
Output rise and fall time	t_r / t_f	7 ns Max.		5 ns Max.		CMOS load:20 % V_{CC} to 80 % V_{CC} level TTL load:0.4 V to 2.4 V level
		5 ns Max.		—		
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}	$\pm 5 \times 10^{-6}$ / 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: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$			-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 μ A Max.	$\bar{S}T$ =GND (SCG)
Symmetry	SYM	40 % to 60 %		45 % to 55 %	50 % V_{CC} level, L_{CMOS} =25 pF
		2.4 V Min.		—	1.4 V level, L_{CMOS} =25 pF
High output voltage	V_{OH}	—		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, $\bar{S}T$ Terminal
	V_{IL}	0.8 V Max.		20 % V_{CC} Max.	
Output rise and fall time	t_r / t_f	—		4 ns Max.	20 % V_{CC} to 80 % V_{CC} level, $L_{CMOS} \leq 25$ pF TTL load:0.4 V to 2.4 V level, $L_{CMOS} \leq 25$ pF
		2.4 ns Max.		3.4 ns Max.	
Oscillation start up time	t_{osc}	12 ms Max.			t=0 at 90 % V_{CC}
Frequency aging	f_{aging}	$\pm 5 \times 10^{-6}$ / 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			
Frequency tolerance	f _{tol(osc)}	—		-40 °C to +85 °C	SG-645PCW / SCW Only -20 °C to +70 °C *1 -40 °C to +85 °C : SG-645PCW / SCW Only
		B: ±50 × 10 ⁻⁶ C: ±100 × 10 ⁻⁶		—	
Current consumption	I _{cc}	45 mA Max.		28 mA Max.	No load condition(Max. frequency range)
Output disable current	I _{dis}	30 mA Max.		16 mA Max.	
Stand-by current	I _{std}	50 μA Max.			ST = GND (STW, SHW, SCW)
Symmetry	SYM	—		40 % to 60 %	50 % V _{cc} level, L _{CMOS} =Max. 1.4 V level, L _{CMOS} =Max.
		40 % to 60 %		—	
High output voltage	V _{OH}	V _{cc} -0.4 V Min.			I _{OH} =-16 mA(P _{TW} , S _{TW} , P _{HW} , S _{HW}) /-8 mA(P _{CW} , S _{CW})
Low output voltage	V _{OL}	0.4 V Max.			I _{OL} = 16 mA(P _{TW} , S _{TW} , P _{HW} , S _{HW}) / 8 mA(P _{CW} , S _{CW})
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 / 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	—		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 < f₀ ≤ 135 MHz

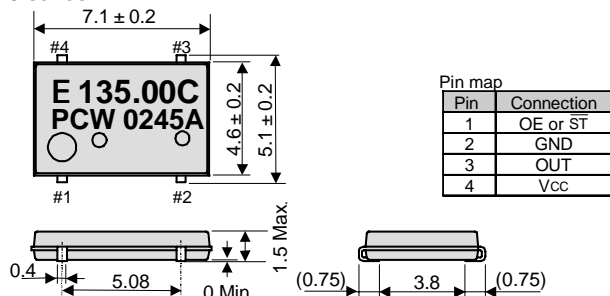
External dimensions

(Unit:mm)

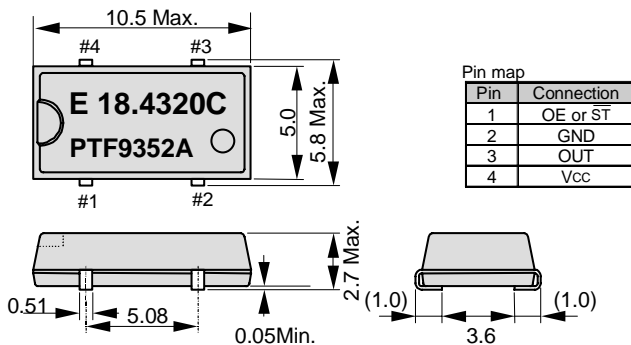
Footprint (Recommended)

(Unit:mm)

SG-645 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.

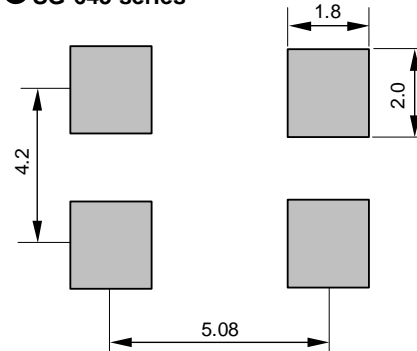
Note.

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.

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

ST pin (SCE)
ST pin = "H" or "open" : Specified frequency output.
ST pin = "L" : Output is low level, oscillation stops.

SG-645 series



SG-636 series

