

CRYSTAL OSCILLATOR SPXO

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 : 2.7 mm Max.
- Lead(Pb)-free : Contains high melting temperature type solder (Pb85 %) exempted by RoHS directive.



Actual size



Specifications (characteristics)

Item		Symbol	Specifications				Remarks
			PTF	PH	PCE / SCE	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				Stored 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
			PTG	PHG	PCG / SCG	
Output frequency range		f _o	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			Stored 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
			40 % to 60 %	—		1.4 V level, L _{CMOS} =25 pF
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		tr / tf	—	3.4 ns Max.	4 ns Max.	20 % V _{cc} to 80 % V _{cc} level, L _{CMOS} ≤ 25 pF
			2.4 ns Max.	—	—	TTL load:0.4 V to 2.4 V level, L _{CMOS} ≤ 25 pF
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

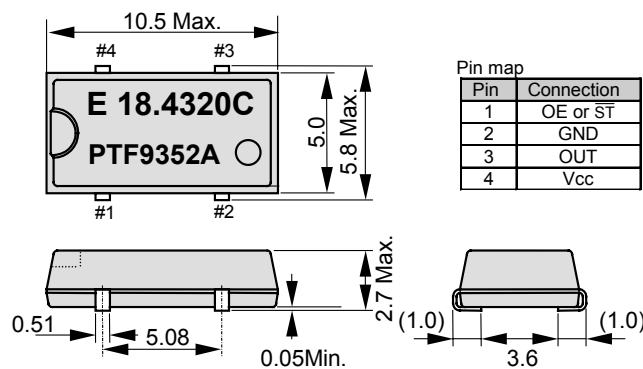
Specifications (characteristics)

Item	Symbol	Specifications			Remarks
		PTW / STW	PHW / SHW	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	-55 °C to +100 °C			Stored 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 *1
Current consumption	I _{cc}	45 mA Max.			28 mA Max.
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.
		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 / disable input voltage	V _{IH}	2.0 V Min.			70 % V _{cc} Min.
	V _{IL}	0.8 V Max.			20 % V _{cc} Max.
Output rise and fall time	tr / tf	4 ns Max.			20 % V _{cc} to 80 % V _{cc} level, L _{CMOS} ≤ Max.
		4 ns Max.			0.4 V to 2.4 V level
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 "C" tolerance : 40 MHz < f₀ ≤ 135 MHz

External dimensions

(Unit:mm)



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.

Footprint (Recommended)

(Unit:mm)

