



CRYSTAL OSCILLATOR (SPXO)

OUTPUT : CMOS, TTL

SG-636 series

- Frequency range : 2.21675 MHz to 135 MHz
- Supply voltage : 2.5 V Typ. / 3.3 V Typ. / 5.0 V Typ.
- Function : Output enable(OE) or Standby(\overline{ST})
- External dimensions : 10.5 × 5.8 × 2.7 mm (t: Max.)



Product Number (please contact us)
SG-636 : Q33636xx2xxxx00



Actual size

SG-636 series



Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		SG-636 PTF	SG-636 PCE SG-636 SCE	SG-636 PDE	
Output frequency range	f _o	2.21675 MHz to 41.000 MHz	2.21675 MHz to 40.000 MHz	2.21675 MHz to 40.000 MHz	Please contact us about available frequencies.
Supply voltage	V _{cc}	5.0 V ±0.5 V	3.3 V ±0.3 V	2.5 V ±0.25 V	
Storage temperature	T _{stg}	-55 °C to +100 °C			Storage as single product.
Operating temperature	T _{use}	-20 °C to +70 °C			
Frequency tolerance	f _{tol}	C: ±100 × 10 ⁻⁶			-20 °C to +70 °C
Current consumption	I _{cc}	17 mA Max.	9 mA Max.	5 mA Max.	No load condition
Disable current	I _{dis}	10 mA Max.	5 mA Max.	3 mA Max.	OE=GND
Stand-by current	I _{std}	—	2 μA Max.	—	\overline{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
Output voltage	V _{OH}	V _{cc} -0.4 V Min.			I _{OH} =-8 mA(PTF) / -4 mA(SCE,PCE) / -3.2 mA(PDE)
	V _{OL}	0.4 V Max.			I _{OL} =16 mA(PTF) / 4 mA(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.	30 pF Max.	15 pF Max.	
Input voltage	V _{IH}	2.0 V Min.	80 % V _{cc} Min.		OE Terminal or \overline{ST} Terminal (SCE)
	V _{IL}	0.8 V Max.	20 % V _{cc} Max.		
Rise time / Fall time	t _r / t _f	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
Start-up time	t _{str}	4 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			Conditions / Remarks
		SG-636 PTG	SG-636 PHG	SG-636 PCG SG-636 SCG	
Output frequency range	f _o	2.21675 MHz to 33.000 MHz *1			Please contact us about available frequencies.
Supply voltage	V _{cc}	4.5 V to 5.5 V		2.7 V to 3.6 V	
Storage temperature	T _{stg}	-55 °C to +100 °C			Storage as single product.
Operating temperature	T _{use}	-20 °C to +70 °C			
Frequency tolerance	f _{tol}	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
Disable curren	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
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
	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.			
Input voltage	V _{IH}	2.0 V Min.		70 % V _{cc} Min.	OE Terminal or ST Terminal
	V _{IL}	0.8 V Max.		20 % V _{cc} Max.	
Rise time / Fall time	tr / tr	—	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
Start-up time	t _{str}	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_o < 4.4336 MHz, 8.2500 MHz < f_o < 8.8672 MHz, 16.500 MHz < f_o < 17.7344 MHz : Unavailable

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Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		SG-636 PTW / STW	SG-636 PHW / SHW	SG-636 PCW / SCW	
Output frequency range	f_0	32.001 MHz to 135.000 MHz			Please contact us about available frequencies.
Supply voltage	V_{cc}	5.0 V ± 0.5 V			3.3 V ± 0.3 V
Storage temperature	T_{stg}	-55 °C to +100 °C			Storage as single product.
Operating temperature	T_{use}	-20 °C to +70 °C			
Frequency tolerance	f_{tol}	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$ (40 MHz $< f_0 \leq 135$ MHz)			-20 °C to +70 °C
Current consumption	I_{cc}	45 mA Max.			28 mA Max.
Disable current	I_{dis}	30 mA Max.			16 mA Max.
Stand-by current	I_{std}	50 μ A 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.
Output voltage	V_{OH}	V_{cc} -0.4 V Min.			I_{OH} =-16 mA(PTW , STW , PHW , SHW) /-8 mA(PCW , SCW)
	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.	—	—	$f_0 \leq 90$ MHz, Max. Supply voltage.
Output load condition (CMOS)	L_{CMOS}	15 pF Max.			Max. frequency, Max. Supply voltage.
Input voltage	V_{IH}	2.0 V Min.			70 % V_{cc} Min.
	V_{IL}	0.8 V Max.			20 % V_{cc} Max.
Rise time / Fall time	t_r / t_f	4 ns Max.			4 ns Max.
		4 ns Max.			20 % V_{cc} to 80 % V_{cc} level, $L_{CMOS} \leq$ Max.
Start-up time	t_{str}	10 ms Max.			0.4 V to 2.4 V level
Frequency aging	f_{aging}	$\pm 5 \times 10^{-6}$ / year Max.			Time at minimum supply voltage to be 0 s
					+25 °C, V_{cc} =5.0 V / 3.3 V, First year

*2 SG-636 series "C" tolerance : 40 MHz $<f_0 \leq 135$ MHz

Product Name SG-636 P T W 135.000000MHz B
(Standard form) ① ②③ ④ ⑤

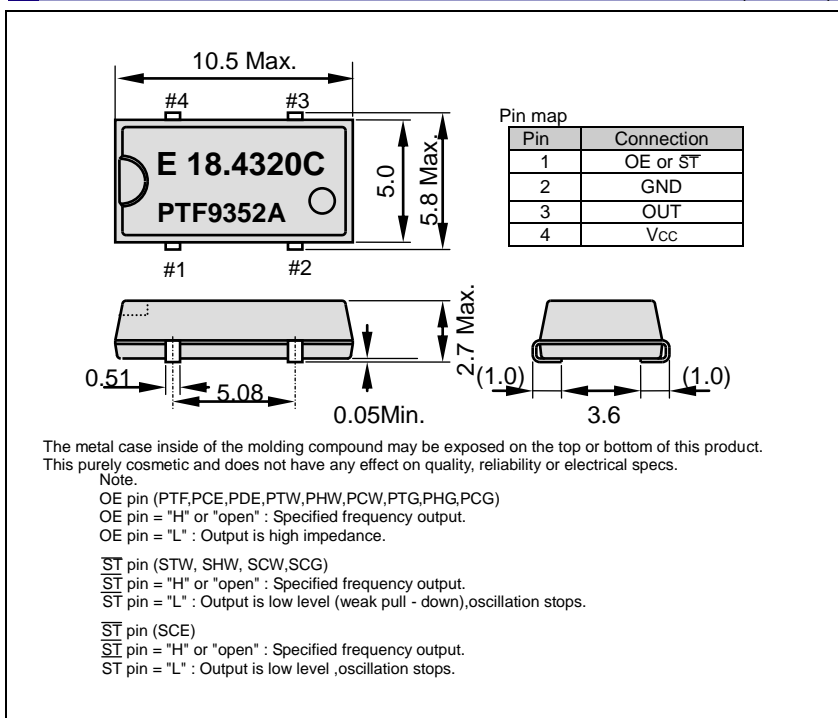
① Model ② Function (P: Output enable, S: Standby)
③ Supply voltage ④ Frequency
⑤ Frequency tolerance

③ Supply voltage	
D	2.5 V Typ.
C	3.3 V Typ.
T,H	5.0 V Typ.

⑤ Frequency tolerance	
B	$\pm 50 \times 10^{-6}$ / -20 to +70°C
C	$\pm 100 \times 10^{-6}$ / -20 to +70°C

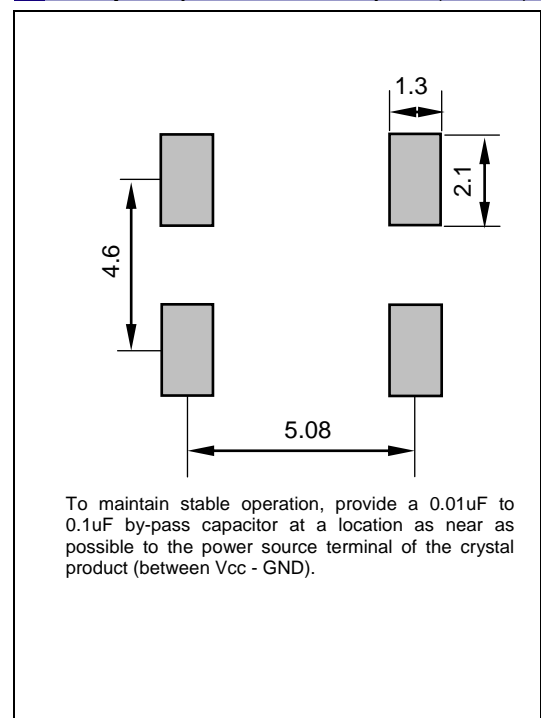
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

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	► Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
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	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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