



CRYSTAL OSCILLATOR (SPXO)
OUTPUT : CMOS

SG-310 series

- Frequency range : 2 MHz to 80 MHz
- Supply voltage : 1.8 V Typ. / 2.5 V Typ. / 3.3 V Typ.
- Current consumption : 1.5 mA Typ.
(SEF: 1.8 V No load condition 48 MHz)
- Function : Standby(\overline{ST})
- External dimensions : 3.2 x 2.5 x 1.05 mm



Product Number (please contact us)
Q33310xx0xxxx00



Actual size

Specifications (characteristics)

Item	Symbol	SG-310 SEF	SG-310 SDF	SG-310 SCF	SG-310 SDN	SG-310 SCN	Conditions / Remarks
Output frequency range	f ₀	2.000 MHz to 48.000 MHz			3.000 MHz to 80.000 MHz		Please contact us about available frequencies.
Supply voltage	V _{cc}	1.8 V Typ. 1.6 V to 2.2 V	2.5 V Typ. 2.2 V to 3.0 V	3.3 V Typ. 2.7 V to 3.6 V	2.5 V Typ. 2.2 V to 2.7 V	3.3 V Typ. 2.7 V to 3.6 V	
Storage temperature	T _{stg}	-40 °C to +125 °C					Storage as single product.
Operating temperature	T _{use}	-40 °C to +85 °C					Please contact us about +85 °C < T _{use}
Frequency tolerance	f _{tol}	B: ±50 × 10 ⁻⁶ , C: ±100 × 10 ⁻⁶ L: ±50 × 10 ⁻⁶ , M: ±100 × 10 ⁻⁶			D: ±20 × 10 ⁻⁶ , S: ±25 × 10 ⁻⁶ R: ±25 × 10 ⁻⁶ , P: ±20 × 10 ⁻⁶ J: ±25 × 10 ⁻⁶		-20 °C to +70 °C -40 °C to +85 °C -20 °C to +70 °C -30 °C to +85 °C -40 °C to +85 °C
		-			-		-
		-			-		-
		-			-		-
Current consumption	I _{cc}	1.5 mA Max.	1.5 mA Max.	1.5 mA Max.	4.0 mA Max.	5.0 mA Max.	No load condition, 2 MHz < f ₀ ≤ 4 MHz
		1.5 mA Max.	1.5 mA Max.	2.0 mA Max.			No load condition, 4 MHz < f ₀ ≤ 8 MHz
		1.5 mA Max.	2.0 mA Max.	2.5 mA Max.			No load condition, 8 MHz < f ₀ ≤ 16 MHz
		2.0 mA Max.	2.0 mA Max.	2.5 mA Max.			No load condition, 16 MHz < f ₀ ≤ 25 MHz
		2.0 mA Max.	2.5 mA Max.	3.5 mA Max.			No load condition, 25 MHz < f ₀ ≤ 33 MHz
		3.0 mA Max.	3.5 mA Max.	4.5 mA Max.			No load condition, 33 MHz < f ₀ ≤ 48 MHz
Stand-by current	I _{std}	0.7 μA Max. (0.2 μA Typ.)	1.5 μA Max. (0.5 μA Typ.)	2.0 μA Max. (1.0 μA Typ.)	10 μA Max.		No load condition, 48 MHz < f ₀ ≤ 80 MHz \overline{ST} = GND
Symmetry	SYM	45 % to 55 %	45 % to 55 %	45 % to 55 %	45 % to 55 %		2 MHz < f ₀ ≤ 16 MHz
		40 % to 60 %					40 % to 60 %
Output voltage	V _{OH}	90 % V _{cc} Min.					I _{OH} = -3 mA
	V _{OL}	10 % V _{cc} Max.					I _{OL} = 3 mA
Output load condition (CMOS)	L _{CMOS}	15 pF Max.					
Input voltage	V _{IH}	80 % V _{cc} Min.			70 % V _{cc} Min.		\overline{ST} terminal
	V _{IL}	20 % V _{cc} Max.			30 % V _{cc} Max.		
Rise time / Fall time	t _r / t _f	4 ns Max.					20 % V _{cc} to 80 % V _{cc} level, L _{CMOS} = 15 pF
Start-up time	t _{str}	10 ms Max.			2 ms Max.		t=0 at 90 % V _{cc}
Frequency aging	f _{aging}	±5 × 10 ⁻⁶ / year Max.			±3 × 10 ⁻⁶ / year Max.		+25 °C, First year, V _{cc} = 1.8 V, 2.5 V, 3.3 V
		-			±10 × 10 ⁻⁶ Max.		+25 °C, 10 years

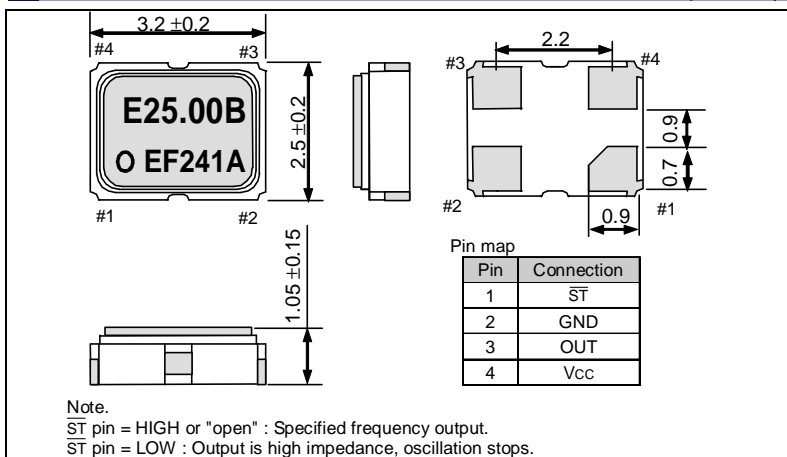
Product Name SG-310 S E F 25.000000MHz L
(Standard form) ① ② ③ ④ ⑤
① Model ② Function (S: Standby)
③ Supply voltage ④ Frequency
⑤ Frequency tolerance

③ Supply voltage	
E	1.8 V Typ.
D	2.5 V Typ.
C	3.3 V Typ.

⑤ Frequency tolerance	*Only SDN, SCN are available	
B	±50 × 10 ⁻⁶ / -20 to +70 °C	D* ±20 × 10 ⁻⁶ / -20 to +70 °C
C	±100 × 10 ⁻⁶ / -20 to +70 °C	S* ±25 × 10 ⁻⁶ / -20 to +70 °C
L	±50 × 10 ⁻⁶ / -40 to +85 °C	R* ±25 × 10 ⁻⁶ / -30 to +85 °C
M	±100 × 10 ⁻⁶ / -40 to +85 °C	P* ±20 × 10 ⁻⁶ / -30 to +85 °C
		J* ±25 × 10 ⁻⁶ / -40 to +85 °C

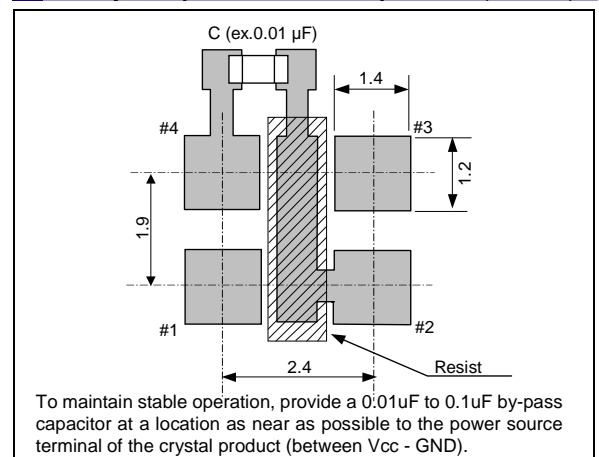
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



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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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	► Pb free.
	► 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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