



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 × 2.5 × 1.05 mm



Product Number (please contact us)
Q33310xx0xxxx00



Actual size

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: $\pm 50 \times 10^{-6}$, C: $\pm 100 \times 10^{-6}$ L: $\pm 50 \times 10^{-6}$, M: $\pm 100 \times 10^{-6}$					-20 °C to +70 °C		
		-					-40 °C to +85 °C		
		-					D: $\pm 20 \times 10^{-6}$, S: $\pm 25 \times 10^{-6}$	-20 °C to +70 °C	
		-					R: $\pm 25 \times 10^{-6}$, P: $\pm 20 \times 10^{-6}$ J: $\pm 25 \times 10^{-6}$	-30 °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 μ A Max. (0.2 μ A Typ.)	1.5 μ A Max. (0.5 μ A Typ.)	2.0 μ A Max. (1.0 μ A Typ.)	10 μ A Max.		\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 %	16 MHz < f_0 ≤ 40 MHz	50 % V_{CC} level
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}	$\pm 5 \times 10^{-6}$ / year Max.			$\pm 3 \times 10^{-6}$ / year Max.		+25 °C, First year, V_{CC} = 1.8 V, 2.5 V, 3.3 V		
		-			$\pm 10 \times 10^{-6}$ Max.		+25 °C, 10 years		

Product Name SG-310 S E F 25.000000MHz L
(Standard form) ① ② ③ ④ ⑤

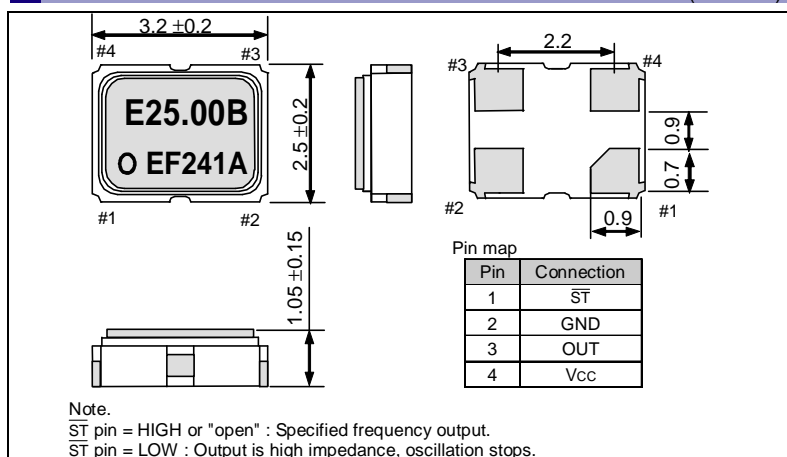
① Model ② Function (S: Standby)
③ Supply voltage ④ Frequency
⑤ Frequency tolerance

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	$\pm 50 \times 10^{-6}$ / -20 to +70 °C	D* $\pm 20 \times 10^{-6}$ / -20 to +70 °C
C	$\pm 100 \times 10^{-6}$ / -20 to +70 °C	S* $\pm 25 \times 10^{-6}$ / -20 to +70 °C
L	$\pm 50 \times 10^{-6}$ / -40 to +85 °C	R* $\pm 25 \times 10^{-6}$ / -30 to +85 °C
M	$\pm 100 \times 10^{-6}$ / -40 to +85 °C	P* $\pm 20 \times 10^{-6}$ / -30 to +85 °C
		J* $\pm 25 \times 10^{-6}$ / -40 to +85 °C

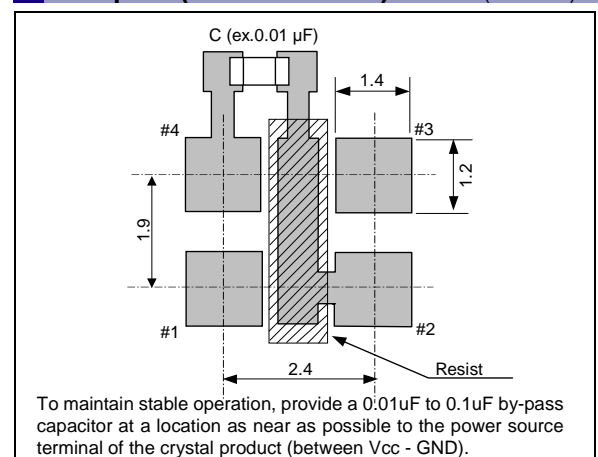
External dimensions

(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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

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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.)
	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc.)

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