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

Pb Free RoHS Compliant

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	f0	2.000 MHz to 48.000 MHz			3.000 MHz to 80.000 MHz		Please contact us about available frequencies.
Supply voltage	Vcc	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 ℃					Storage as single product.
Operating temperature	T_use	-40 °C to +85 ℃			-40 °C to +85 ℃ (+105 ℃)		Please contact us about +85 ℃ < T_use
Frequency tolerance	f_tol	B: ±50 × 10^{-6}, C: ±100 × 10^{-6}					-20 °C to +70 °C
		L: ±50 × 10^{-6}, M: ±100 × 10^{-6}					-40 °C to +85 °C
		–			D:±20 × 10^{-6} ,S:±25 × 10^{-6}		-20 °C to +70 °C
		–			R:±25 × 10^{-6} ,P:±20 × 10^{-6}		-30 °C to +85 °C
		–			J:±25 × 10^{-6}		-40 °C to +85 °C
Current consumption	Icc	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≤f0≤ 4 MHz
		1.5 mA Max.	1.5 mA Max.	2.0 mA Max.			No load condition, 4 MHz<f0≤ 8 MHz
		1.5 mA Max.	2.0 mA Max.	2.5 mA Max.			No load condition, 8 MHz<f0≤16 MHz
		2.0 mA Max.	2.0 mA Max.	2.5 mA Max.			No load condition, 16 MHz<f0≤25 MHz
		2.0 mA Max.	2.5 mA Max.	3.5 mA Max.			No load condition, 25 MHz<f0≤33 MHz
		3.0 mA Max.	3.5 mA Max.	4.5 mA Max.			No load condition, 33 MHz<f0≤48 MHz
		–			6.0 mA Max.	7.0 mA Max.	No load condition, 48 MHz<f0≤80 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.		$\overline{ST}$ =GND
Symmetry	SYM	45 % to 55 %	45 % to 55 %	45 % to 55 %	45 % to 55 %		2 MHz≤f0≤16 MHz / 50 % Vcc level
		40 % to 60 %	40 % to 60 %				16 MHz<f0≤40 MHz / L_CMOS ≤ 15 pF
							40 MHz<f0≤80 MHz
Output voltage	VOH	90 % Vcc Min.					IOH=-3 mA
	VOL	10 % Vcc Max.					IOL= 3 mA
Output load condition (CMOS)	L_CMOS	15 pF Max.					
Input voltage	VIH	80 % Vcc Min.			70 % Vcc Min.		$\overline{ST}$ terminal
	VIL	20 % Vcc Max.			30 % Vcc Max.		
Rise time / Fall time	tr/ tf	4 ns Max.					20 % Vcc to 80 % Vcc level, L_CMOS=15 pF
Start-up time	t_str	10 ms Max.			2 ms Max.		t=0 at 90 % Vcc
Frequency aging	f_aging	±5 × 10^{-6} / year Max.			±3 × 10^{-6} / year Max.		+25 ℃, First year, V cc=1.8 V, 2.5 V, 3.3 V
		–			±10 × 10^{-6} Max.		+25 ℃, 10 years

Product Name (Standard form)

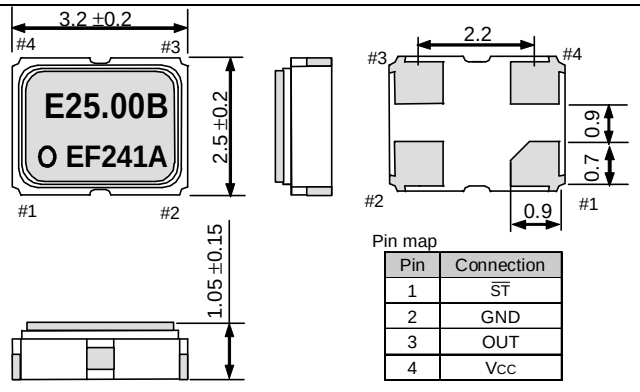
SG-310 S E F 25.000000MHz L
① ②③ ④ ⑤

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

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

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

External dimensions (Unit:mm)

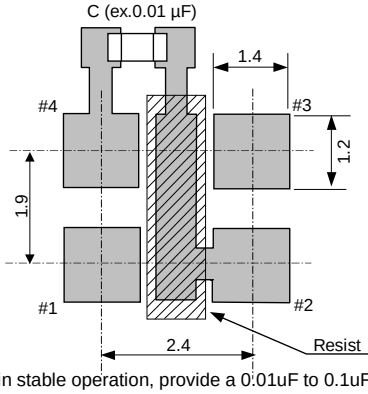


Pin map

Pin	Connection
1	$\overline{ST}$
2	GND
3	OUT
4	Vcc

Note.
$\overline{ST}$ pin = HIGH or "open" : Specified frequency output.
$\overline{ST}$ pin = LOW : Output is high impedance, oscillation stops.

Footprint (Recommended) (Unit:mm)



To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

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.

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

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

►Explanation of the mark that are using it for the catalog

Pb Free	►Pb free.
RoHS Compliant	►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.)
For Automotive	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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