CRYSTAL OSCILLATOR (SPXO)

OUTPUT : CMOS

Low Jitter

SG - 210 S*D

- Frequency range : 50.000 MHz to 80.000 MHz
- Supply voltage : 1.8 V Typ. / 2.5 V Typ. / 3.3 VTyp.
- Current consumption : 7.0 mA Max.
  : (SDD: 2.5 V No load condition 80 MHz)
- Function : Standby($\overline{ST}$)
- External dimensions : 2.5 × 2.0 × 0.8 mm

Pb Free RoHS Compliant

Product Number (please contact us)
X1G0029x1xxxx00

Actual size

Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		SG-210SED	SG-210SDD	SG-210SCD	
Output frequency range	f_0	50.000 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	
Storage temperature	T_stg	-40 °C to +125 °C			Storage as single product.
Operating temperature	T_use	-40 °C to +85 °C			
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
Current consumption	I_{CC}	6.0 mA Max.	7.0 mA Max.	8.0 mA Max.	No load condition
Stand-by current	I_std	10.0 µA Max.			$\overline{ST}$ =GND
Symmetry	SYM	45 % to 55 %			50 % V_{CC} level,L_CMOS ≤ 30 pF
Output voltage	V_{OH}	V_{CC} -0.4 V Min.			I_{OH}=-8 mA(SCD,SDD), -4 mA(SED)
	V_{OL}	0.4 V Max.			I_{OL}= 8 mA(SCD,SDD), 4 mA(SED)
Output load condition (CMOS)	L_CMOS	30 pF Max.			
Input voltage	V_{IH}	70 % V_{CC} Min.			$\overline{ST}$ terminal
	V_{IL}	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 ≤ 30 pF
Start-up time	t_str	2 ms Max.			t=0 at 90 % V_{CC}
Frequency aging	f_aging	±3 × 10^{-6}/ year Max..			+25 °C, First year, V_{CC}= 1.8 V, 2.5 V, 3.3 V
		±10 × 10^{-6}/ 10 years Max.			+25 °C, 10 years, V_{CC}= 1.8 V, 2.5 V, 3.3 V
Jitter *1	t_{DJ}	0.1 ps Typ.	0.1 ps Typ.		Deterministic Jitter
	t_{RJ}	3.2 ps Typ.	2.7 ps Typ.		Random Jitter
	t_{RMS}	30 ps Typ.	25 ps Typ.		Peak to Peak
Phase Jitter	t_{PJ}	1.0 ps Max.			Offset frequency: 12 kHz to 20 MHz

L_CMOS ≤ 15 pF

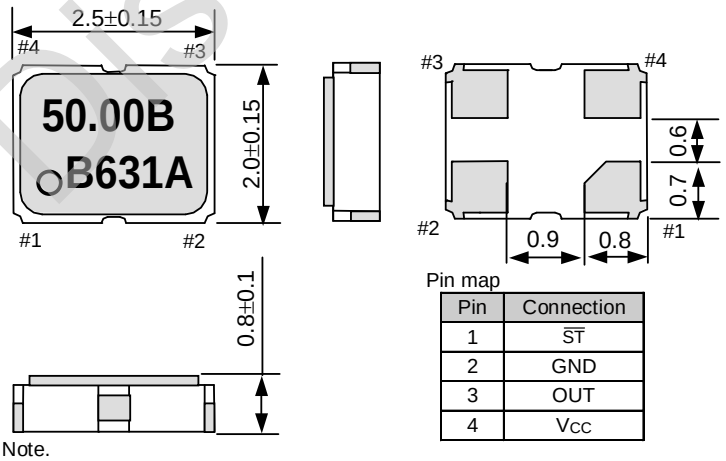
*1 Tested using a DTS-2075 Digital timing system made by WAVECREST with jitter analysis software VISI6.

Product Name (Standard form): SG-210 S E D 50.000000MHz 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	
B	±50 × 10^{-6} / -20 to +70°C
C	±100 × 10^{-6} / -20 to +70°C
L	±50 × 10^{-6} / -40 to +85°C
M	±100 × 10^{-6} / -40 to +85°C

External dimensions (Unit:mm)

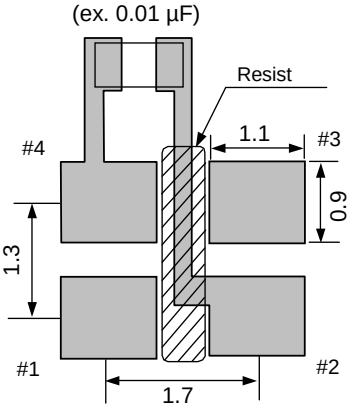


Pin map

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

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.

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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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