CRYSTAL OSCILLATOR (SPXO)

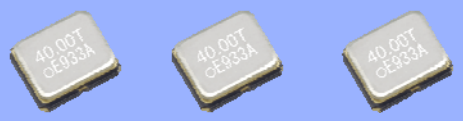
OUTPUT : CMOS

SG - 211 S*E

- Frequency range : 2.375 MHz to 60.000 MHz
- Supply voltage : 1.8 V Typ. / 2.5 V Typ. / 3.3 V Typ.
- Current consumption : 1.2 mA Typ. (SEE: 1.8 V No load condition 40 MHz)
- Function : Standby($\overline{ST}$)
- External dimensions : 2.5 × 2.0 × 0.7 mm

Pb Free RoHS Compliant

Product Number (please contact us)
X1G0036x1xxxx00



Actual size

Specifications (characteristics)

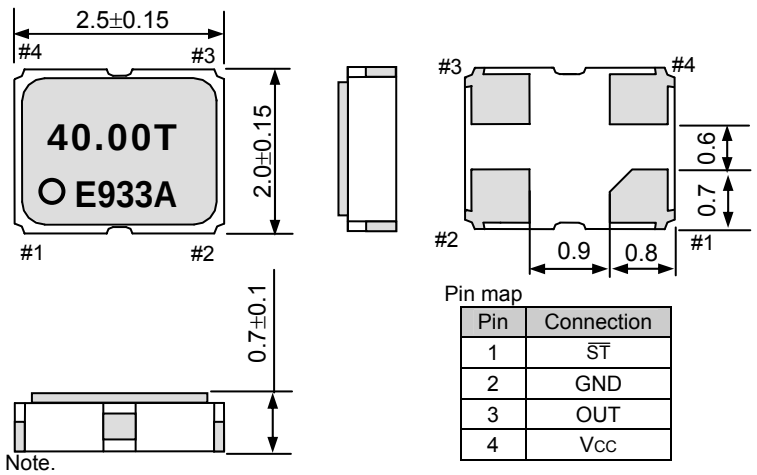
Item	Symbol	Specifications SG-211SEE	SG-211SDE	SG-211SCE	Conditions / Remarks	
Output frequency range	f_0	2.375 MHz to 60.000 MHz			Please contact us about available frequencies.	
Supply voltage	V_{CC}	1.8 V Typ. 1.6 V to 2.2 V	2.5 V Typ. 2.2 V to 2.7 V	3.3 V Typ. 2.7 V to 3.6 V		
Storage temperature	T_stg	-40 °C to +125 °C			Storage as single product.	
Operating temperature	T_use	-40 °C to +90 °C				
Frequency tolerance	f_tol	D: ±20 × 10^{-6}, E: ±15 × 10^{-6}			-20 °C to +70 °C	V_{CC} ±10% included in reflow drift
		H: ±20 × 10^{-6}, T: ±15 × 10^{-6}			-40 °C to +85 °C	
		a: ±15 × 10^{-6}, b: ±20 × 10^{-6},d: ±25 × 10^{-6}			-40 °C to +90 °C	
Current consumption	I_{CC}	2.3 mA Max.	2.5 mA Max.	3.5 mA Max.	No load condition,2.375 MHz≤f_0≤32 MHz	
		2.8 mA Max.	3.0 mA Max.	4.0 mA Max.	No load condition,32 MHz<f_0≤40 MHz	
		3.3 mA Max.	3.5 mA Max.	4.5 mA Max.	No load condition,40 MHz<f_0≤48 MHz	
		4.5 mA Max.	5.0 mA Max.	6.0 mA Max.	No load condition,48 MHz<f_0≤60 MHz	
Stand-by current	I_std	5.0 µA Max.			$\overline{ST}$ =GND	
Symmetry	SYM	45 % to 55 %			50 % V_{CC} level,L_CMOS ≤ 15 pF	
Output voltage	V_{OH}	90 % V_{CC} Min.			I_{OH}=-4 mA	
	V_{OL}	10 % V_{CC} Max.			I_{OL}= 4 mA	
Output load condition (CMOS)	L_CMOS	15 pF Max.				
Input voltage	V_{IH}	80 % V_{CC} Min.			$\overline{ST}$ terminal	
	V_{IL}	20 % V_{CC} Max.				
Rise time / Fall time	t_r/ t_f	4.5 ns Max.			20 % V_{CC} to 80 % V_{CC} level,L_CMOS=15 pF	
Start-up time	t_str	5 ms Max.			t=0 at 90 % V_{CC}	
Frequency aging	f_aging	This is included in frequency tolerance specification.			+25 °C, First year, V_{CC}= 1.8 V, 2.5 V, 3.3 V	

Product Name (Standard form)
SG-211 S E E 40.000000MHz D
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	
D	±20 × 10^{-6} / -20 to +70°C
E	±15 × 10^{-6} / -20 to +70°C
H	±20 × 10^{-6} / -40 to +85°C
T	±15 × 10^{-6} / -40 to +85°C
a	±15 × 10^{-6} / -40 to +90°C
b	±20 × 10^{-6} / -40 to +90°C
d	±25 × 10^{-6} / -40 to +90°C

External dimensions (Unit:mm)

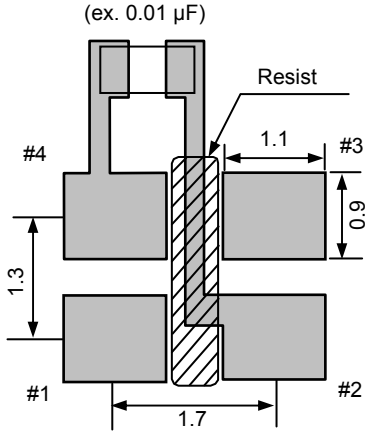


Pin map

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

Note.
$\overline{ST}$ pin = HIGH : 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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SG-211SCE 24.0000MT3 SG-211SCE 25.0000MT3 SG-211SCE 27.0000MT3 SG-211SCE 10.0004MTX SG-211SCE 16.0000MaX SG-211SCE 2.8000ME SG-211SCE 24.0000MH SG-211SCE 25.0000Mb SG-211SCE 50.0000MDX SG-211SEE 24.0000MT SG-211SEE 24.0000MT3 SG-211SEE 26.0000MH0 SG-211SEE 26.0000MT SG-211SEE 38.4000MT3 SG-211SCE 40.0000MH SG-211SCE 50.0000ME SG-211SCE 50.0000MT SG-211SCE 60.0000ME SG-211SCE 60.0000MH SG-211SDE 54.0000MT3 SG-211SCE 25.0000MD SG-211SCE 25.0000MH SG-211SCE 25.0000MH0 SG-211SCE 26.0000MT SG-211SCE 26.0000MT3 SG-211SCE 31.2500MT SG-211SCE 12.0000MH SG-211SCE 16.0000MH3 SG-211SCE 16.3840MH SG-211SCE 24.0000MD3 SG-211SCE 25.0000Ma SG-211SCE 25.0000Ma3 SG-211SCE 50.0000MH3 SG-211SCE 50.0000MTX SG-211SCE 8.0000MHX SG-211SEE 15.6250MT0 SG-211SEE 26.0000MHX SG-211SEE 26.0000MTX SG-211SCE 36.0000MH3 SG-211SCE 16.0000Ma SG-211SCE 30.7200MH SG-211SCE 32.0000MH3 SG-211SCE 26.0000ME SG-211SCE 16.0000Ma0 SG-211SCE 20.0000MH