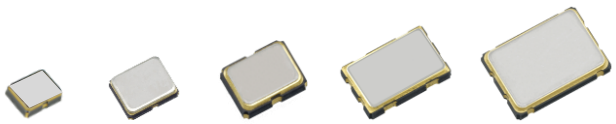
CRYSTAL OSCILLATOR (SPXO)
OUTPUT : CMOS

Pb Free RoHS Compliant

Product Number
SG2016CAN: X1G004801xxxx00
SG-210STF: X1G004171xxxx00
SG3225CAN: X1G005961xxxx15
SG5032CAN: X1G004451xxxx00
SG7050CAN: X1G004481xxxx00

SG2016 / 3225 / 5032 / 7050CAN
SG-210STF

- Frequency range : 1.2 MHz to 75 MHz (SG2016CAN)
  1 MHz to 75 MHz (other than the above)
- Supply voltage : 1.8 V to 3.3 V Typ.
- Function : Standby($\overline{ST}$)
- Operating temperature : -40 °C to +105 °C


SG-210STF (2.5 x 2.0 mm) SG3225CAN (3.2 x 2.5 mm) SG5032CAN (5.0 x 3.2 mm) SG7050CAN (7.0 x 5.0 mm)

Specifications (characteristics)

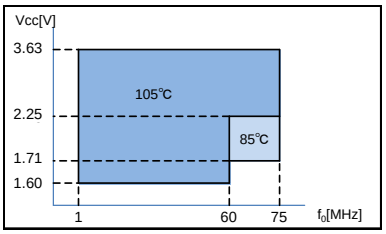
Item	Symbol	Specifications			Conditions / Remarks
Output frequency range	fo	1.2 MHz to 75 MHz			SG2016CAN; Please contact us about available frequencies.
		1 MHz to 75 MHz			All others
Supply voltage	V_{CC}	1.60 V to 3.63 V			1 MHz ≤ fo ≤ 60 MHz, T_use = +105 °C Max. (Refer to figure *1)
		1.71 V to 3.63 V			60 MHz < fo ≤ 75 MHz, T_use = +85 °C Max.
		2.25 V to 3.63 V			60 MHz < fo ≤ 75 MHz, T_use = +105 °C Max.
Storage temperature	T_stg	-55 °C to +125 °C			SG2016CAN
		-40 °C to +125 °C			All others
Operating temperature	T_use	-20 °C to +70 °C, -40 °C to +85 °C, -40 °C to +105 °C			See of figure *1
Frequency tolerance	f_tol	±25 × 10^{-6}, ±50 × 10^{-6}			-20 °C to +70 °C
		±50 × 10^{-6}			-40 °C to +85 °C
		±50 × 10^{-6}, ±100 × 10^{-6}			-40 °C to +105 °C
Current consumption	I_{CC}	V_{CC} = 1.8 V ± 10 %	V_{CC} = 2.5 V ± 10 %	V_{CC} = 3.3 V ± 10 %	
		1.5 mA Max.	1.6 mA Max.	1.8 mA Max.	No load condition, 1 MHz ≤ fo ≤ 20 MHz
		1.8 mA Max.	2.0 mA Max.	2.2 mA Max.	No load condition, 20 MHz < fo ≤ 40 MHz
		2.1 mA Max.	2.4 mA Max.	2.6 mA Max.	No load condition, 40 MHz < fo ≤ 60 MHz
		2.4 mA Max.	2.8 mA Max.	3.0 mA Max.	No load condition, 60 MHz < fo ≤ 75 MHz
Stand-by current	I_std	2.1 µA Max.	2.5 µA Max.	2.7 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.			1.8 V ± 10 %: I_{OH} -1.5 mA, I_{OL} 1.5 mA; 2.5 V ± 10 %: I_{OH} -3 mA, I_{OL} 3 mA; 3.3 V ± 10 %: I_{OH} -4 mA, I_{OL} 4 mA
	V_{OL}	10 % V_{CC} Max.			
	V_{OH-2}	V_{CC} - 0.4 V Min.			1.8 V±10 %: I_{OH} -3 mA, I_{OL} 3 mA; 2.5 V±10 %: I_{OH} -4 mA, I_{OL} 4 mA; 3.3 V±10 %: I_{OH} -6 mA, I_{OL} 6 mA
	V_{OL-2}	0.4 V Max.			
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 and Fall time	tr / tf	3 ns Max. 3.5 ns Max. (@1.8 V±10 %)			20 % V_{CC} to 80 % V_{CC} level, L_CMOS = 15 pF
Start-up time	t_str	3 ms Max.			T = 0 at 90 % V_{CC}
Frequency aging	f_age	±3 × 10^{-6} / year Max.			+25 °C, First year

[Model : SG2016 / 3225 / 5032 / 7050CAN]
Product name SG2016 C AN 25.000000MHz T J G A (⑤⑥: Available code DB, JB, JG, JH, LG, LH)
(Standard form) ① ② ③ ④⑤⑥⑦
①Model ②Output(C:CMOS) ③Frequency ④Supply voltage
⑤Frequency tolerance ⑥Operating temperature range ⑦Internal identification code("A" is default)

④Supply voltage	See *1
T	1.60 to 3.63 V
K	2.25 to 3.63 V

⑤Frequency tolerance	
D	±25 × 10^{-6}
J	±50 × 10^{-6}
L	±100 × 10^{-6}

⑥Operating temperature range	
B	-20 °C to +70 °C
G	-40 °C to +85 °C
H	-40 °C to +105 °C



*1 : The upper limit of Operating temperature and the related conditions
Please note that Supply voltage range (V_{CC}) depends on Output frequency(fo) and upper limit of Operationg temperature(T_use Max.).

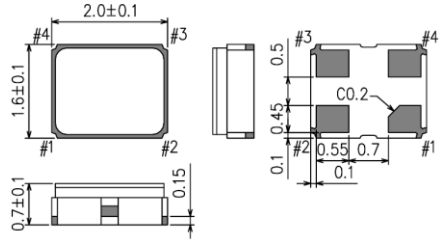
[Model : SG-210STF]
Product name SG-210 S T F 25.000000MHz L
(Standard form) ① ②③ ④ ⑤
①Model ②Function(S:Standby) ③Supply voltage
④Frequency ⑤Frequency tolerance

③Supply voltage	See *1
T	1.60 to 3.63 V

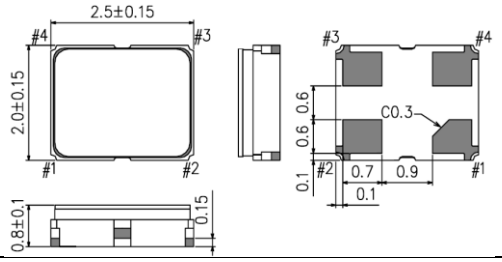
⑤Frequency tolerance	
S	±25 × 10^{-6} / -20 °C to +70 °C
L	±50 × 10^{-6} / -40 °C to +85 °C
Y	±50 × 10^{-6} / -40 °C to +105 °C
W	±100 × 10^{-6} / -40 °C to +105 °C

External dimensions (Unit:mm)

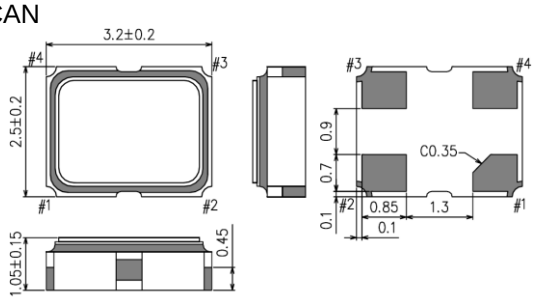
SG2016CAN



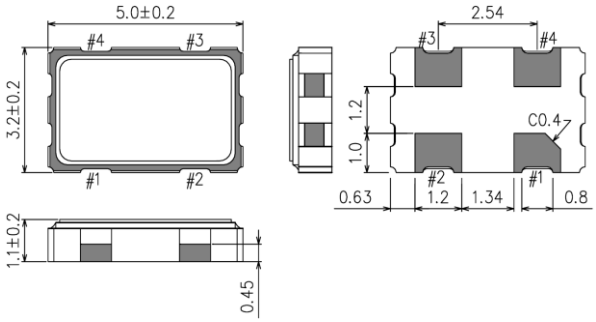
SG-210STF



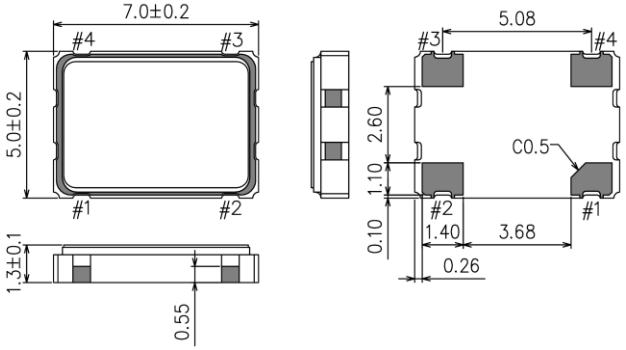
SG3225CAN



SG5032CAN

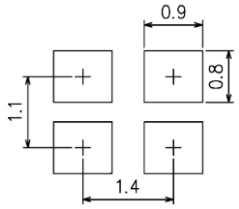


SG7050CAN

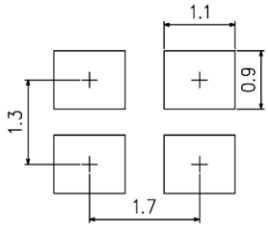


Footprint (Recommended) (Unit:mm)

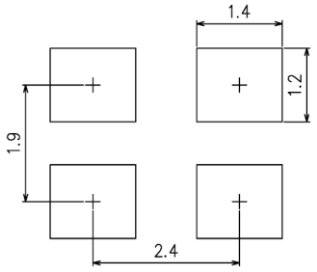
SG2016CAN



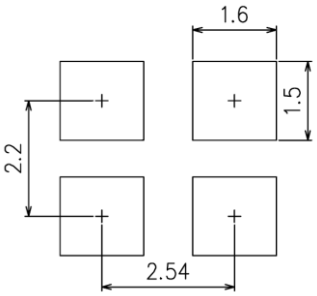
SG-210STF



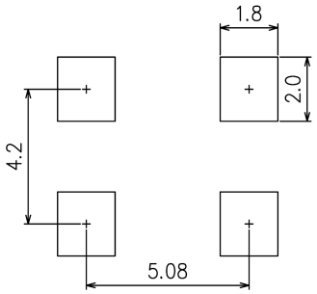
SG3225CAN



SG5032CAN



SG7050CAN



Pin Map

Pin	Connection	Function
1	ST	ST terminal ST function / Oscillator circuit / Output HIGH or "open" / Oscillation / Specified frequency: Enable LOW / Oscillation stop / High impedance: Disable
2	GND	Ground
3	OUT	Clock output
4	V_{CC}	Power supply

■**Notes:** 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 IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

IATF 16949 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.
	►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).