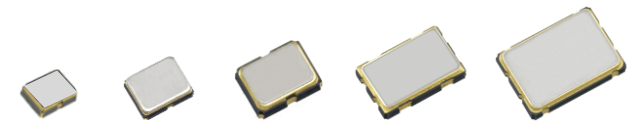
CRYSTAL OSCILLATOR (SPXO)
OUTPUT : CMOS

Pb Free RoHS Compliant

Product Number (please contact us)
SG2016CAN: X1G004801xxxx00
SG-210STF: X1G004171xxxx00
SG3225CAN: X1G005961xxxx15
SG5032CAN: X1G004451xxxx00
SG7050CAN: X1G004481xxxx00

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

- Frequency : 20 standard frequencies
- Supply voltage : 1.8 V to 3.3 V Typ.
- Function : Standby($\overline{ST}$)
- Operating temperature : -40 °C to +105 °C



SG2016CAN (2.0 x 1.6 mm) 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	fo	4 MHz 8 MHz 10 MHz 12 MHz 12.288 MHz 14.7456 MHz 16 MHz 20 MHz 24 MHz 24.576 MHz 25 MHz 26 MHz 27 MHz 32 MHz 33.33 MHz 33.3333 MHz 40 MHz 48 MHz 50 MHz 72 MHz			
Supply voltage	V_{CC}	1.60 V to 3.63 V			4 MHz ≤ fo ≤ 50 MHz, T_use = +105 °C Max. — Refer to Figure 1
		1.71 V to 3.63 V			fo = 72 MHz, T_use = +85 °C Max.
		2.25 V to 3.63 V			fo = 72 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}			-20 °C to +70 °C
		±50 × 10^{-6}			-40 °C to +85 °C, -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, 4 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 ≤ 50 MHz
		2.4 mA Max.	2.8 mA Max.	3.0 mA Max.	No load condition, fo = 72 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 % / 2.5 V ± 10 % / 3.3 V ± 10 % I_{OH} -1.5 mA / -3 mA / -4 mA I_{OL} 1.5 mA / 3 mA / 4 mA
	V_{OL}	10 % V_{CC} Max.			
	V_{OH-2}	V_{CC} - 0.4 V Min.			1.8 V±10 % / 2.5 V±10 % / 3.3 V±10 % I_{OH} -3 mA / -4 mA / -6 mA I_{OL} 3 mA / 4 mA / 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 H A
(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 Figure 1	
T	1.8 V to 3.3 V Typ.
K	2.5 V to 3.3 V Typ.

⑤Frequency tolerance / ⑥Operating temperature range	
DB	±25 × 10^{-6} / -20 °C to +70 °C
JG	±50 × 10^{-6} / -40 °C to +85 °C
JH	±50 × 10^{-6} / -40 °C to +105 °C

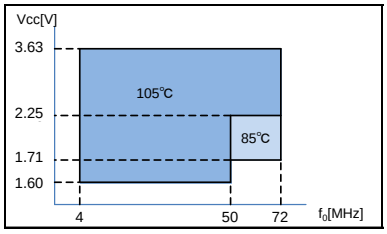


Figure 1 : The upper limit of Operating temperature and the related conditions

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 Y
(Standard form) ① ②③ ④ ⑤

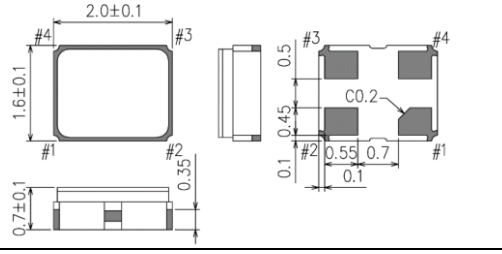
①Model ②Function(S:Standby) ③Supply voltage
④Frequency ⑤Frequency tolerance

③Supply voltage *See Figure 1	
T	1.8 V to 3.3 V Typ.

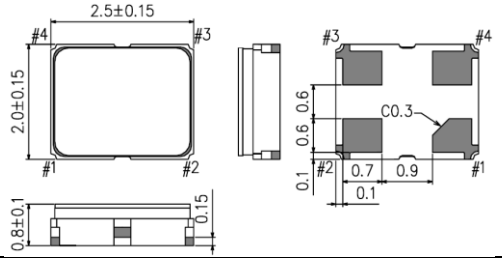
⑤Frequency tolerance	
S	±25 × 10^{-6} / -20 °C to +70 °C
L	±50 × 10^{-6} / -40 °C to +85 °C
Y	±50 × 10^{-6} / -40 °C to +105 °C

External dimensions (Unit:mm)

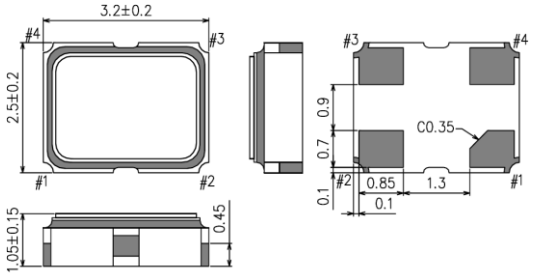
SG2016CAN



SG-210STF



SG3225CAN



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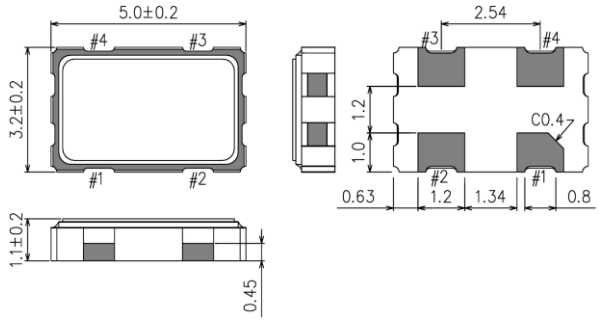
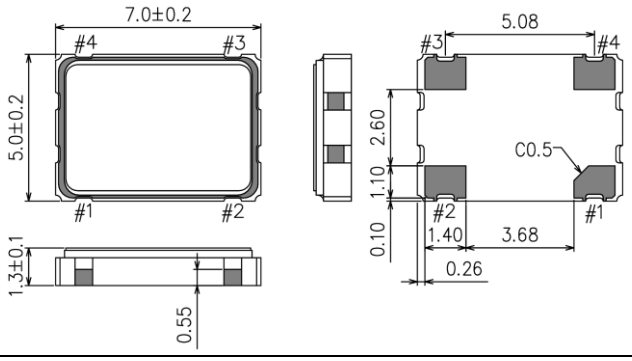
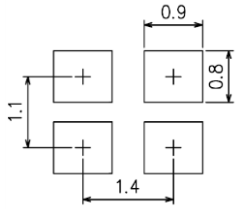


SG7050CAN

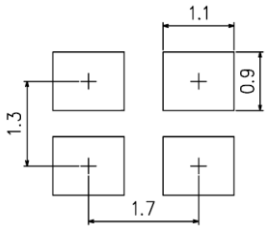


Footprint (Recommended) (Unit:mm)

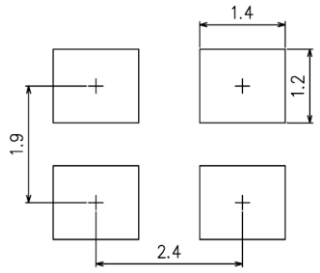
SG2016CAN



SG-210STF



SG3225CAN



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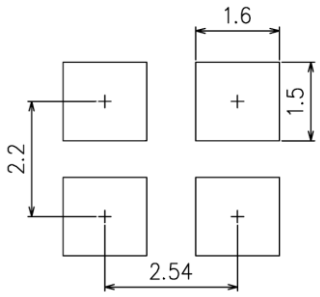

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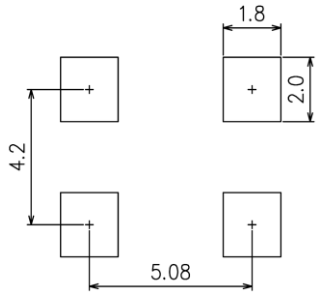

Pin Map

Pin	Connection	Function
1	ST	ST terminal
2	GND	Ground
3	OUT	Clock output
4	V_{CC}	Power supply

ST function	Oscillator circuit	Output
HIGH or "open"	Oscillation	Specified frequency: Enable
LOW	Oscillation stop	High impedance: Disable

■**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	►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).