

**CRYSTAL OSCILLATOR (SPXO)**
**OUTPUT : CMOS**


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


**Specifications (characteristics)**

Item	Symbol	Specifications					Conditions / Remarks		
Output frequency	fo	4 MHz 14.7456 MHz 25 MHz 33.3333 MHz	8 MHz 16 MHz 26 MHz 40 MHz	10 MHz 20 MHz 27 MHz 48 MHz	12 MHz 24 MHz 32 MHz 50 MHz	12.288 MHz 24.576 MHz 33.33 MHz 72 MHz			
Supply voltage	Vcc	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, SG3225CAN		
		-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 <sup>-6</sup>					-20 °C to +70 °C		
		±50 × 10 <sup>-6</sup>					-40 °C to +85 °C, -40 °C to +105 °C		
Current consumption	Icc	Vcc = 1.8 V ± 10 %	Vcc = 2.5 V ± 10 %		Vcc = 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.		ST =GND		
Symmetry	SYM	45 % to 55 %					50 % Vcc level, L_CMOS ≤ 15 pF		
Output voltage	VOH	90 % Vcc Min.							
	VOL	10 % Vcc Max.							
	VOH-2	Vcc - 0.4 V Min.							
	VOL-2	0.4 V Max.							
Output load condition (CMOS)	L_CMOS	15 pF Max.							
Input voltage	VIH	80 % Vcc Min.					ST terminal		
	VIL	20 % Vcc Max.							
Rise time and Fall time	tr / tf	3 ns Max. 3.5 ns Max. (@ 1.8 V±10 %)					20 % Vcc to 80 % Vcc level, L_CMOS = 15 pF		
Start-up time	t_str	3 ms Max.					T = 0 at 90 % Vcc		
Frequency aging	f_age	±3 × 10 <sup>-6</sup> / year Max.					+25 °C, First year		

[Model : SG2016 / 3225 / 5032 / 7050CAN]

Product name **SG2016CAN 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		⑤Frequency tolerance / ⑥Operating temperature range	
T	1.8 V to 3.3 V Typ.	DB*	$\pm 25 \times 10^{-6}$ / -20 °C to +70 °C
K	2.5 V to 3.3 V Typ.	JG	$\pm 50 \times 10^{-6}$ / -40 °C to +85 °C
		JH	$\pm 50 \times 10^{-6}$ / -40 °C to +105 °C

\* Please refer to Product number list on Full Data Sheet for available frequencies

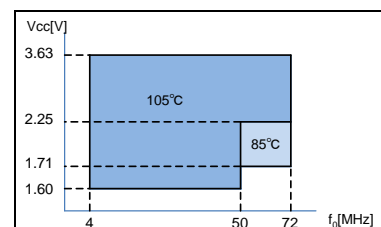


Figure 1 : The upper limit of Operating temperature and the related conditions

Please note that Supply voltage range ( $V_{CC}$ ) depends on Output frequency ( $f_o$ ) and upper limit of Operating temperature ( $T_{use}$  Max.).

[Model : SG-210STF]

Product name **SG-210STF 25.000000MHz Y**

(Standard form) ① ②③ ④ ⑤

①Model ②Function(S: Standby) ③Supply voltage

④Frequency ⑤Frequency tolerance

③Supply voltage *See Figure 1		⑤Frequency tolerance	
T	1.8 V to 3.3 V Typ.	S*	$\pm 25 \times 10^{-6}$ / -20 °C to +70 °C
		L	$\pm 50 \times 10^{-6}$ / -40 °C to +85 °C
		Y	$\pm 50 \times 10^{-6}$ / -40 °C to +105 °C

\* Please refer to Product number list on Full Data Sheet for available frequencies



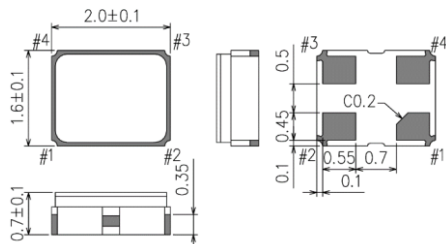
## External dimensions

(Unit:mm)

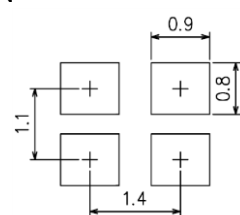
## Footprint (Recommended)

(Unit:mm)

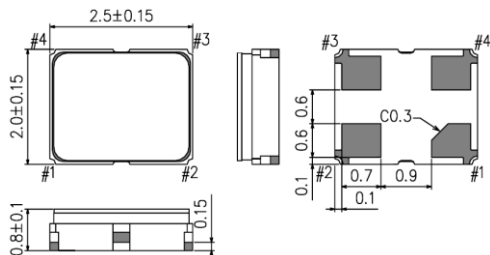
SG2016CAN



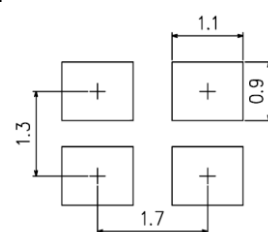
SG2016CAN



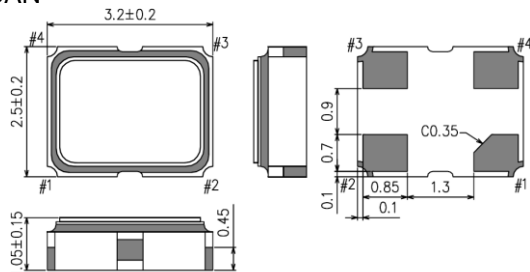
SG-210STF



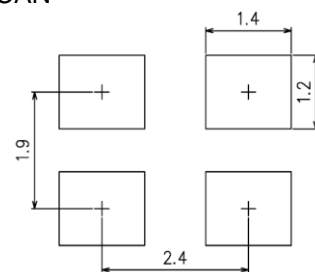
SG-210STF



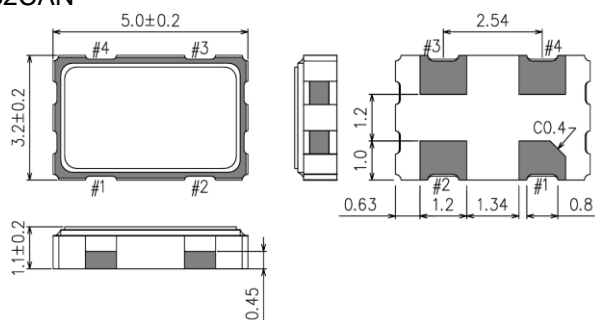
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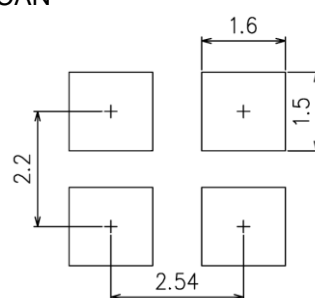
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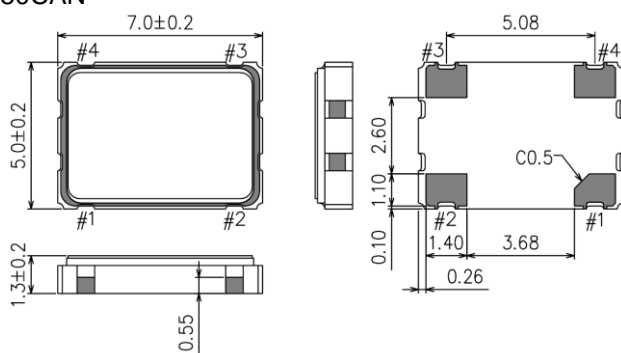
SG5032CAN



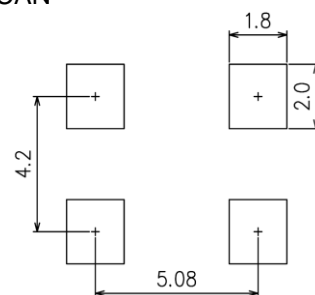
SG5032CAN



SG7050CAN



SG7050CAN



## Pin Map

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

■Notes: To maintain stable operation, provide a 0.01μF to 0.1μF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between V<sub>CC</sub> - 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.

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	► 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 ).

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