

CRYSTAL OSCILLATOR (SPXO)

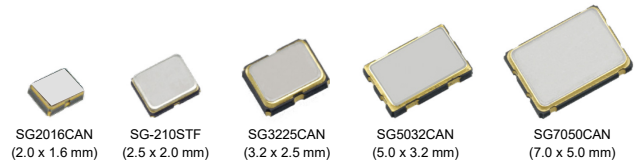
OUTPUT : CMOS



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	f_o	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 $\leq f_o \leq$ 50 MHz, $T_{use} = +105^\circ C$ Max.													
		1.71 V to 3.63 V	$f_o = 72$ MHz, $T_{use} = +85^\circ C$ Max.													
		2.25 V to 3.63 V	$f_o = 72$ MHz, $T_{use} = +105^\circ C$ 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}	$\pm 25 \times 10^{-6}$	-20 °C to +70 °C													
		$\pm 50 \times 10^{-6}$	-40 °C to +85 °C, -40 °C to +105 °C													
Current consumption	I_{CC}	$V_{CC} = 1.8 V \pm 10 \%$	$V_{CC} = 2.5 V \pm 10 \%$	$V_{CC} = 3.3 V \pm 10 \%$												
		1.5 mA Max.	1.6 mA Max.	1.8 mA Max.	No load condition, 4 MHz $\leq f_o \leq$ 20 MHz											
		1.8 mA Max.	2.0 mA Max.	2.2 mA Max.	No load condition, 20 MHz $< f_o \leq$ 40 MHz											
		2.1 mA Max.	2.4 mA Max.	2.6 mA Max.	No load condition, 40 MHz $< f_o \leq$ 50 MHz											
		2.4 mA Max.	2.8 mA Max.	3.0 mA Max.	No load condition, $f_o = 72$ MHz											
Stand-by current	I_{std}	2.1 μ A Max.	2.5 μ A Max.	2.7 μ A Max.	$\overline{ST} = GND$											
Symmetry	SYM	45 % to 55 %	50 % V_{CC} level, $L_{CMOS} \leq 15$ pF													
Output voltage	V_{OH}	90 % V_{CC} Min.	<table border="1"> <tr> <td></td> <td>1.8 V $\pm 10 \%$</td> <td>2.5 V $\pm 10 \%$</td> <td>3.3 V $\pm 10 \%$</td> </tr> <tr> <td>I_{OH}</td> <td>-1.5 mA</td> <td>-3 mA</td> <td>-4 mA</td> </tr> <tr> <td>I_{OL}</td> <td>1.5 mA</td> <td>3 mA</td> <td>4 mA</td> </tr> </table>			1.8 V $\pm 10 \%$	2.5 V $\pm 10 \%$	3.3 V $\pm 10 \%$	I_{OH}	-1.5 mA	-3 mA	-4 mA	I_{OL}	1.5 mA	3 mA	4 mA
		1.8 V $\pm 10 \%$	2.5 V $\pm 10 \%$	3.3 V $\pm 10 \%$												
	I_{OH}	-1.5 mA	-3 mA	-4 mA												
	I_{OL}	1.5 mA	3 mA	4 mA												
V_{OL}	10 % V_{CC} Max.	<table border="1"> <tr> <td></td> <td>1.8 V $\pm 10 \%$</td> <td>2.5 V $\pm 10 \%$</td> <td>3.3 V $\pm 10 \%$</td> </tr> <tr> <td>I_{OH}</td> <td>-3 mA</td> <td>-4 mA</td> <td>-6 mA</td> </tr> <tr> <td>I_{OL}</td> <td>3 mA</td> <td>4 mA</td> <td>6 mA</td> </tr> </table>			1.8 V $\pm 10 \%$	2.5 V $\pm 10 \%$	3.3 V $\pm 10 \%$	I_{OH}	-3 mA	-4 mA	-6 mA	I_{OL}	3 mA	4 mA	6 mA	
	1.8 V $\pm 10 \%$	2.5 V $\pm 10 \%$	3.3 V $\pm 10 \%$													
I_{OH}	-3 mA	-4 mA	-6 mA													
I_{OL}	3 mA	4 mA	6 mA													
V_{OH-2}	$V_{CC} - 0.4$ V Min.															
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	t_r / t_f	3 ns Max. 3.5 ns Max. (@1.8 V $\pm 10 \%$)	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}	$\pm 3 \times 10^{-6}$ / year Max.	+25 °C, First year													

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

Product name SG2016CAN25.000000MHzTJHA

(Standard form) ① ② ③ ④⑤⑥⑦

- ① Model ② Output(C: CMOS) ③ Frequency ④ Supply voltage
- ⑤ Frequency tolerance ⑥ Operating temperature range
- ⑦ Internal identification code("A" is default)

④ Supply voltage *See Figure 1	⑤ Frequency tolerance / ⑥ Operating 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

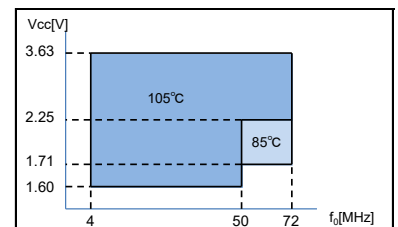


Figure 1 : The upper limit of Operating temperature and the related conditions

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

[Model : SG-210STF]

Product name SG-210STF25.000000MHzY

(Standard form) ① ②③ ④ ⑤

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

③ Supply voltage *See Figure 1	⑤ Frequency 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

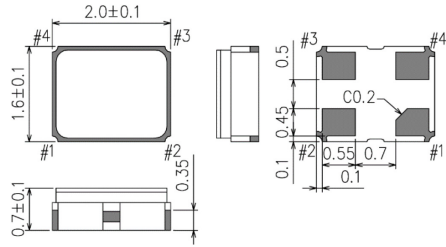
External dimensions

(Unit:mm)

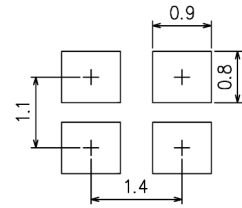
Footprint (Recommended)

(Unit:mm)

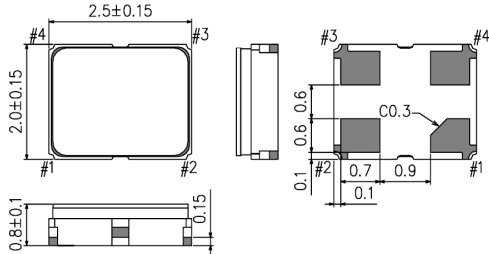
SG2016CAN



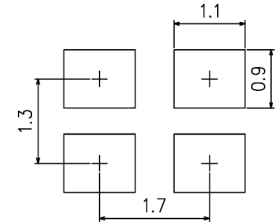
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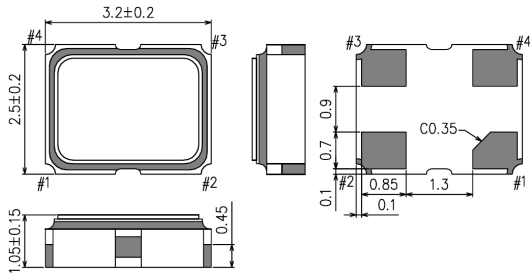
SG-210STF



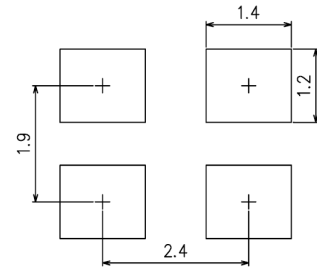
SG-210STF



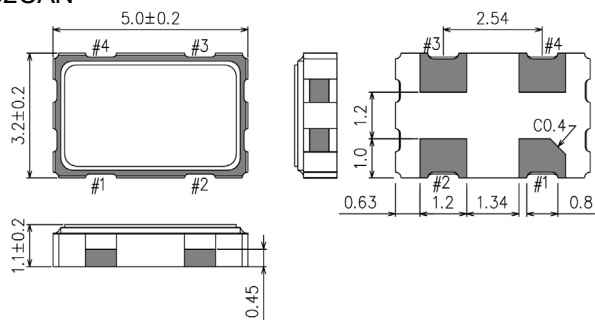
SG3225CAN



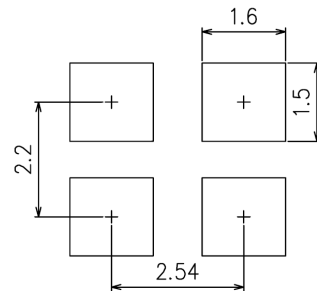
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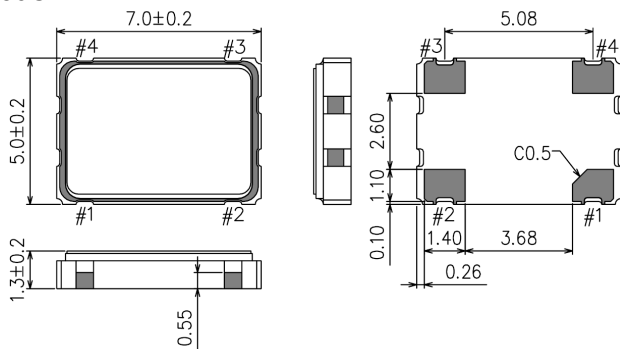
SG5032CAN



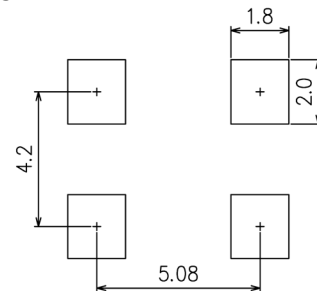
SG5032CAN



SG7050CAN



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 V_{cc} - 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.
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