

CRYSTAL OSCILLATOR (SPXO)

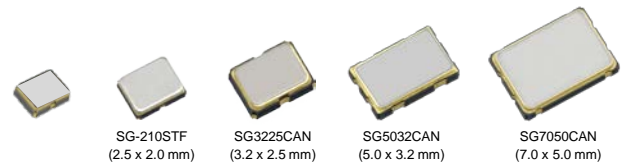
OUTPUT : CMOS



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



Specifications (characteristics)

Item	Symbol	Specifications	Conditions / Remarks														
Output frequency range	fo	1.2 MHz to 75 MHz	SG2016CAN														
		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.														
		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.	<table border="1"> <tr> <td></td> <td>1.8 V ± 10 %</td> <td>2.5 V ± 10 %</td> <td>3.3 V ± 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 ± 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
		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.	<table border="1"> <tr> <td></td> <td>1.8 V ± 10 %</td> <td>2.5 V ± 10 %</td> <td>3.3 V ± 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 ± 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	
	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 _{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	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 SG2016CAN25.000000MHzTJGA (ⓄⓄ : Available code DB, JB, JG, JH, LG, LH)

(Standard form) ① ② ③ ④⑤⑥⑦

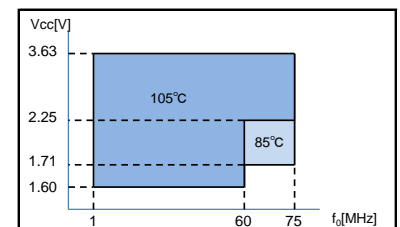
①Model ②Output(C:CMOS) ③Frequency ④Supply voltage

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



[Model : SG-210STF]

Product name SG-210STF25.000000MHzL

(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

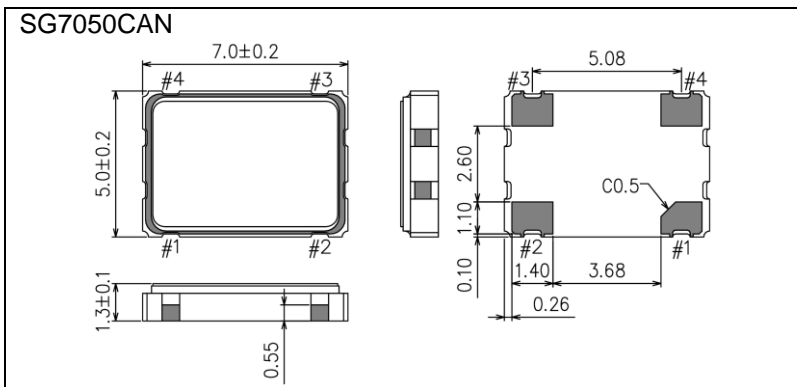
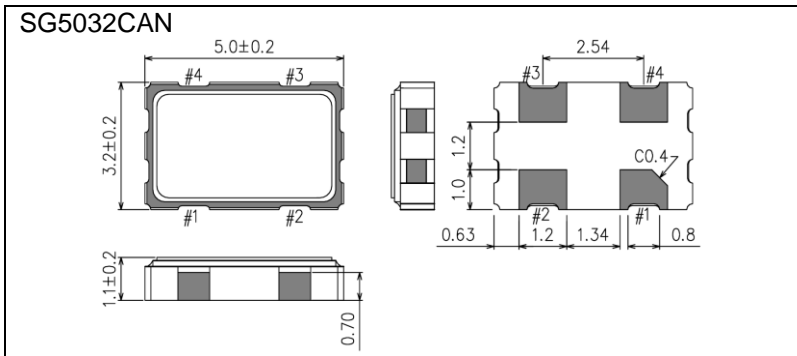
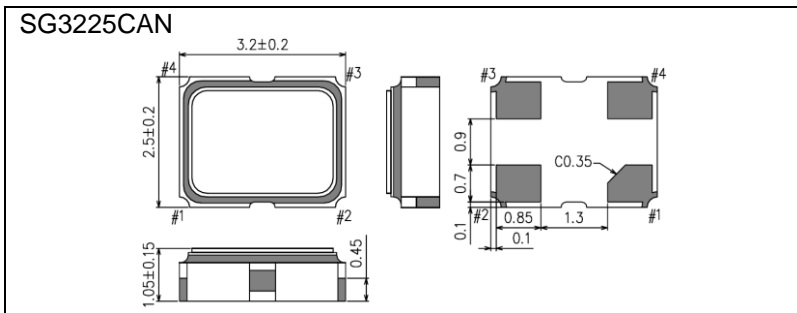
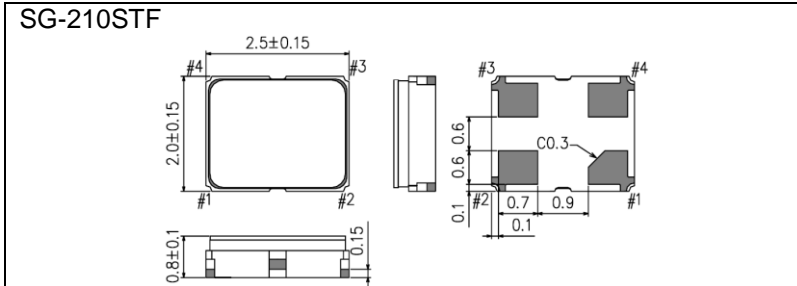
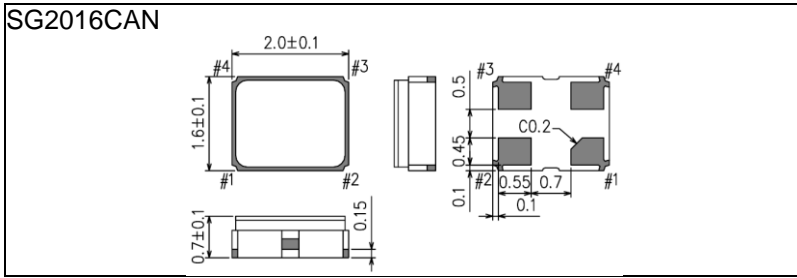
⑤Frequency tolerance	
S	±25 × 10 ⁻⁶ / -20 °C to +70 °C
L	±50 × 10 ⁻⁶ / -40 °C to +85 °C
Y	±50 × 10 ⁻⁶ / -40 °C to +105 °C
W	±100 × 10 ⁻⁶ / -40 °C to +105 °C

*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 Operating temperature(T_{use} Max.).

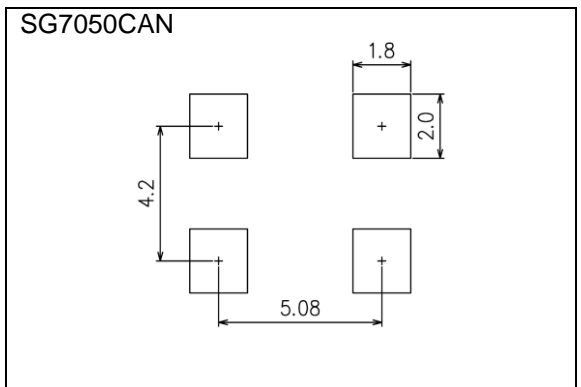
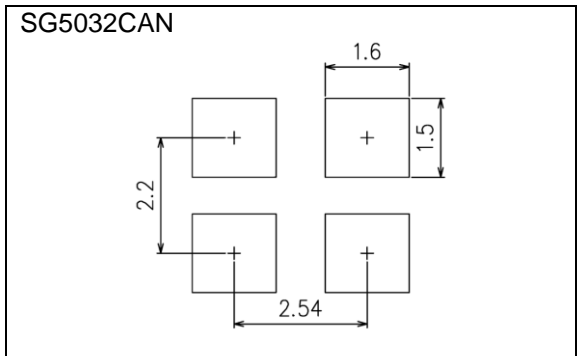
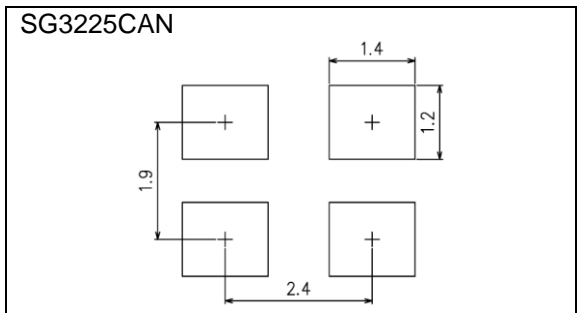
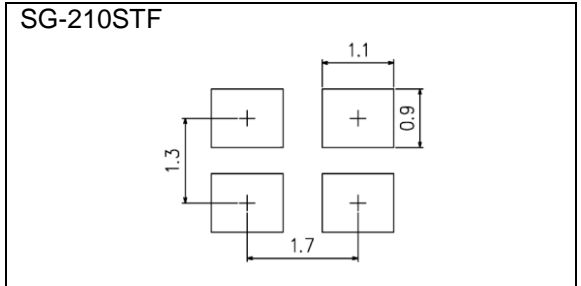
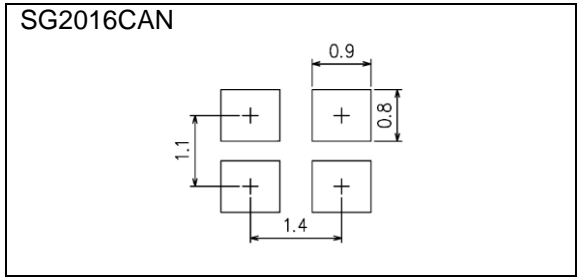
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



Pin Map

Pin	Connection	Function		
		ST terminal	Oscillator circuit	Output
1	ST	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).

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	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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