CRYSTAL OSCILLATOR (SPXO)
OUTPUT : CMOS

Pb Free

RoHS Compliant

SG2016CAN / SG3225CAN / SG5032CAN / SG7050CAN / SG-210STF

- Frequency   : 1.2 MHz to 75 MHz
- 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	1.2 MHz to 75 MHz					Please contact us for frequencies other than the standard ones.			
		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					Standard frequency			
Supply voltage range	V_{CC}	1.60 V to 3.63 V					1.2 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 range	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 × 10⁻⁶					-20 °C to +70 °C, -40 °C to +105 °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, 1.2 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 %	2.5 V ± 10 %	3.3 V ± 10 %
	V_{OL}	10 % V_{CC} Max.					I_{OH} / I_{OL}	-1.5 mA / 1.5 mA	-3 mA / 3 mA	-4 mA / 4 mA
	V_{OH-2}	V_{CC} - 0.4 V Min.						1.8 V±10 %	2.5 V±10 %	3.3 V±10 %
	V_{OL-2}	0.4 V Max.					I_{OH} / I_{OL}	-3 mA / 3 mA	-4 mA / 4 mA	-6 mA / 6 mA
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 : SG2016CAN / SG3225CAN / SG5032CAN / SG7050CAN]

Product name   SG2016CAN   25.000000MHz   T   J   H   A
(Standard form)   a   b   c   d e f g

a: Model   b: Output(C: CMOS)   c: Frequency   d: Supply voltage   e: Frequency tolerance
f: Operating temperature range   g: Internal identification code ("A" is default)

d: Supply voltage *See Figure 1	
T	1.8 V to 3.3 V Typ.
K	2.5 V to 3.3 V Typ.

e: Frequency tolerance / f: Operating temperature range	
DB*	±25 × 10⁻⁶ / -20 °C to +70 °C
DG*	±25 × 10⁻⁶ / -40 °C to +85 °C
JG	±50 × 10⁻⁶ / -40 °C to +85 °C
JH	±50 × 10⁻⁶ / -40 °C to +105 °C

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

[Model : SG-210STF]

Product name   SG210STF   25.000000MHz   L
(Standard form)   a   bc   d   e

a: Model   b: Function (S: Standby)   c: Supply voltage   d: Frequency   e: Frequency tolerance

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

e: Frequency tolerance	
S*	±25 × 10⁻⁶ / -20 °C to +70 °C
J*	±25 × 10⁻⁶ / -40 °C to +85 °C
L	±50 × 10⁻⁶ / -40 °C to +85 °C
Y	±50 × 10⁻⁶ / -40 °C to +105 °C

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

Vcc[V]
3.63
2.25
1.71
1.60
        105℃
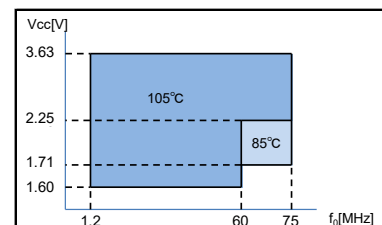   85℃
1.2   60 75   f₀[MHz]

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.).

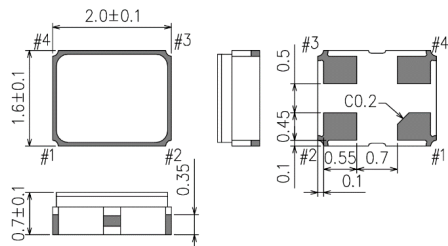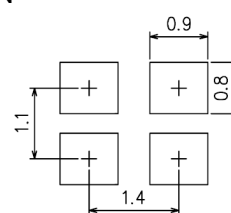## External dimensions (Unit:mm)

Footprint (Recommended) (Unit:mm)

SG2016CAN
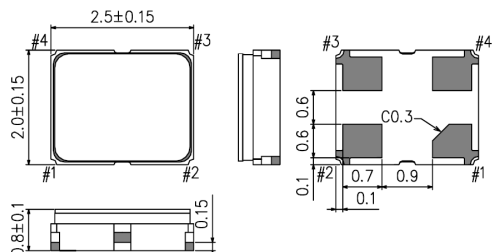
SG-210STF

SG3225CAN
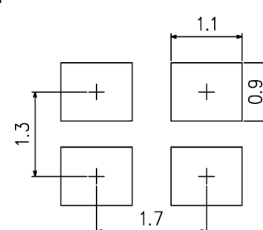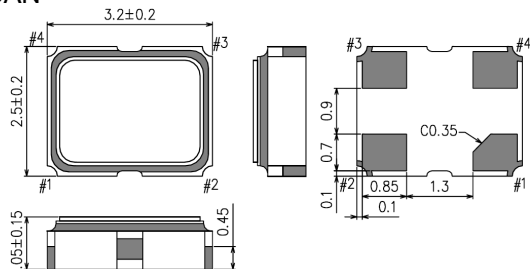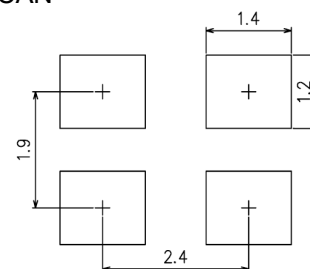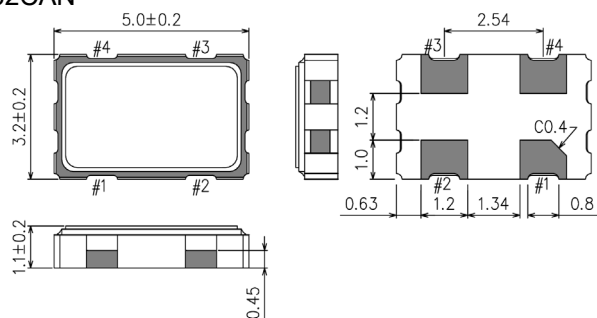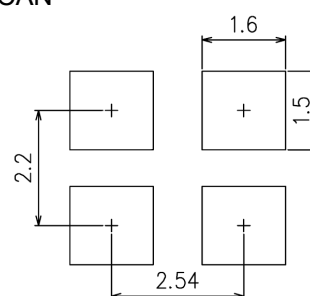
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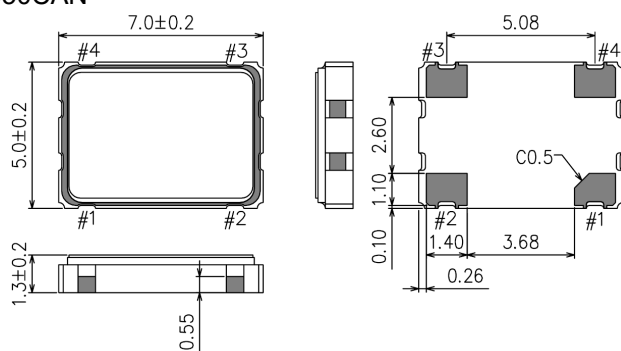
SG7050CAN
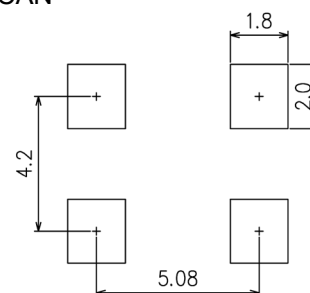
Pin Map

Pin	Connection	Function			
1	$\overline{\text{ST}}$	$\overline{\text{ST}}$ terminal			
		$\overline{\text{ST}}$ 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).

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 general equipment.
Automotive Safety	►Designed for automotive applications related to driving and safety.

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