CRYSTAL OSCILLATOR (SPXO)

OUTPUT : CMOS

SG - 210 S*B

- Frequency range : 2 MHz to 60 MHz
- Supply voltage : 1.5 V Typ. / 1.8 V Typ. / 2.5 V Typ. / 3.3 V Typ.
- Current consumption : 0.9 mA Typ. (SEB: 1.8 V No load condition 48 MHz)
- Function : Standby($\overline{ST}$)
- External dimensions : 2.5 × 2.0 × 0.8 mm
- Operation temperature : +105 °C / +125 °C

Pb Free RoHS Compliant

Product Number (please contact us)
Q33210Bx0xxxx00

Actual size

Specifications (characteristics)

Item	Symbol	SG-210SGB	SG-210SEB	SG-210SDB	SG-210SCB	Conditions / Remarks
Output frequency range	f_0	2 MHz to 32 MHz	2 MHz to 60 MHz			Please contact us about available frequencies
Supply voltage	V_{CC}	1.5 V Typ. 1.3 V to 1.7 V	1.8 V Typ. 1.6 V to 2.2 V	2.5 V Typ. 2.2 V to 3.0 V	3.3 V Typ. 2.7 V to 3.6 V	
Storage temperature	T_stg	-40 °C to +125 °C				Storage as single product.
Operating temperature	T_use	-40 °C to +85 °C / -40 °C to +105 °C / -40 °C to +125 °C				
Frequency tolerance	f_tol	F: ±20 × 10^{-6}				-10 °C to +60 °C, $f_0 \leq$ 32 MHz, V_{CC} ±10%, except reflow drift.
		B: ±50 × 10^{-6}, C: ±100 × 10^{-6}				-20 °C to +70 °C
		L:±50 × 10^{-6},M:±100 × 10^{-6}				-40 °C to +85 °C
		–	Y:±50 × 10^{-6},W:±100 × 10^{-6}			-40 °C to +105 °C
		–	Z:±100 × 10^{-6},X:±150 × 10^{-6}			-40 °C to +125 °C
Current consumption	I_{CC}	1.0 mA Max.	1.6 mA Max.	2.4 mA Max.	3.0 mA Max.	No load condition
		–	2.0 mA Max	3.0 mA Max.	4.0 mA Max.	No load condition +105 °C,+125 °C
Stand-by current	I_std	0.3 µA Max.	0.5 µA Max.	1.0 µA Max.	1.0 µA Max.	$\overline{ST}$ =GND
		–	1.6 µA Max.	2.4 µA Max.	3.0 µA Max.	$\overline{ST}$ =GND +105 °C,+125 °C
Symmetry	SYM	45 % to 55 %	45 % to 55 %	45 % to 55 %	45 % to 55 %	2 MHz≤f_0≤16 MHz / 16 MHz<f_0≤32 MHz / 32 MHz<f_0≤60 MHz: 50 % V_{CC} level, L_CMOS ≤ 15 pF
		40 % to 60 %				
		–	40 % to 60 %	40 % to 60 %		
		–	40 % to 60 %			+105 °C,+125 °C
Output voltage	V_{OH}	90 % V_{CC} Min.				I_{OH}=-1 mA
	V_{OL}	10 % V_{CC} Max.				I_{OL}= 1 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	t_r/ t_f	5 ns Max.	4 ns Max.	3 ns Max.		+85 °C: 20 % V_{CC} to 80 % V_{CC} level, L_CMOS=15 pF
		–	7 ns Max			+105 °C,+125 °C
Start-up time	t_str	3 ms Max.				t=0 at 90 % V_{CC} (+105 °C,+125 °C : 5 ms Max.)
Frequency aging	f_aging	±3 × 10^{-6} / year Max.				+25 °C, First year, V_{CC}=1.5 V,1.8 V, 2.5 V, 3.3 V

Product Name (Standard form)

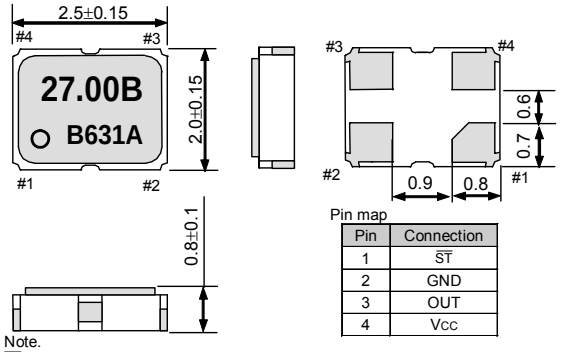
SG-210 S G B 27.000000MHz L
① ②③ ④ ⑤

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

③Supply voltage	
G	1.5 V Typ.
E	1.8 V Typ.
D	2.5 V Typ.
C	3.3 V Typ.

⑤Frequency tolerance	*Except for SGB
F	±20 × 10^{-6} / -10 to +60°C($f_0 \leqq$ 32 MHz)
B	±50 × 10^{-6} / -20 to +70°C
C	±100 × 10^{-6} / -20 to +70°C
L	±50 × 10^{-6} / -40 to +85°C
M	±100 × 10^{-6} / -40 to +85°C
Y*	±50 × 10^{-6} / -40 to +105°C
W*	±100 × 10^{-6} / -40 to +105°C
Z*	±100 × 10^{-6} / -40 to +125°C
X*	±150 × 10^{-6} / -40 to +125°C

External dimensions (Unit:mm)

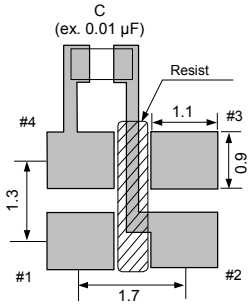


Pin map

Pin	Connection
1	$\overline{ST}$
2	GND
3	OUT
4	V_{CC}

Note.
$\overline{ST}$ pin = HIGH or "open" : Specified frequency output.
$\overline{ST}$ pin = LOW : Output is high impedance, oscillation stops.

Footprint (Recommended) (Unit:mm)



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).