



# CRYSTAL OSCILLATOR

## Low Profile / High stability SPXO

# SG-211 S\*E

- Frequency range : 2.375 MHz to 60.000 MHz
- Supply voltage : 1.8 V / 2.5 V / 3.3 V
- Current consumption : 1.2 mA Typ.  
(SEE: 1.8 V No load condition 40 MHz)
- Function : Standby( $\overline{ST}$ )
- External dimensions : 2.5 × 2.0 × 0.7 mm



Product Number (please contact us)  
X1G0036x1xxxx00



Actual size



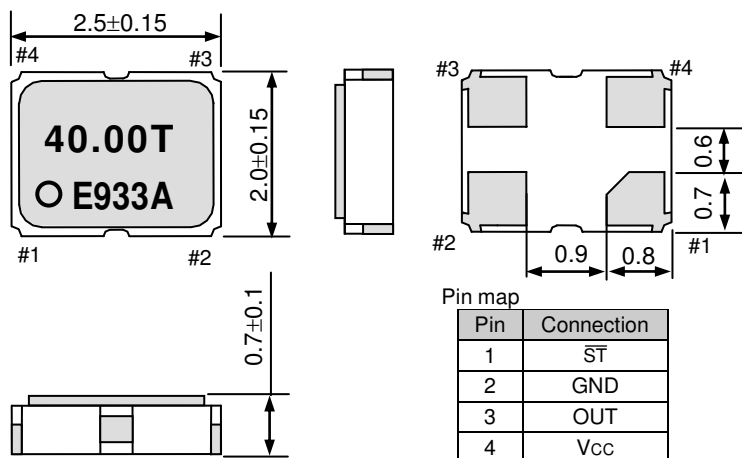
## Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		SG-211SEE	SG-211SDE	SG-211SCE	
Output frequency range	$f_0$	2.375 MHz to 60.000 MHz			Please contact us for inquiries regarding the available frequencies.
Supply voltage	$V_{CC}$	1.8 V Typ. 1.6 V to 2.2 V	2.5 V Typ. 2.2 V to 2.7 V	3.3 V Typ. 2.7 V to 3.6 V	
Storage temperature	$T_{stg}$	-40 °C to +125 °C			Store as bare product.
Operating temperature	$T_{use}$	-40 °C to +90 °C			
Frequency tolerance *	$f_{tol}$	D: $\pm 20 \times 10^{-6}$ , E: $\pm 15 \times 10^{-6}$			-20 °C to +70 °C
		H: $\pm 20 \times 10^{-6}$ , T: $\pm 15 \times 10^{-6}$			-40 °C to +85 °C
		a: $\pm 15 \times 10^{-6}$ , b: $\pm 20 \times 10^{-6}$ , d: $\pm 25 \times 10^{-6}$			-40 °C to +90 °C
Current consumption	$I_{CC}$	2.3 mA Max.	2.5 mA Max.	3.5 mA Max.	No load condition, 2.375 MHz <math>f_0 \leq 32 MHz
		2.8 mA Max.	3.0 mA Max.	4.0 mA Max.	No load condition, 32 MHz <math>f_0 \leq 40 MHz
		3.3 mA Max.	3.5 mA Max.	4.5 mA Max.	No load condition, 40 MHz <math>f_0 \leq 48 MHz
		4.5 mA Max.	5.0 mA Max.	6.0 mA Max.	No load condition, 48 MHz <math>f_0 \leq 60 MHz
Stand-by current	$I_{std}$	5.0 $\mu$ 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.			$I_{OH} = -4$ mA
	$V_{OL}$	10 % $V_{CC}$ Max.			$I_{OL} = 4$ 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 / Fall time	$t_r / t_f$	4.5 ns Max.			20 % $V_{CC}$ to 80 % $V_{CC}$ level, $L_{CMOS} = 15$ pF
Start-up time	$t_{str}$	5 ms Max.			$t = 0$ at 90 % $V_{CC}$
Frequency aging	$f_{aging}$	This is included in frequency tolerance specification.			+25 °C, First year, $V_{CC} = 1.8$ V, 2.5 V, 3.3 V

\* Please contact us for inquiries regarding available frequency tolerance.

## External dimensions

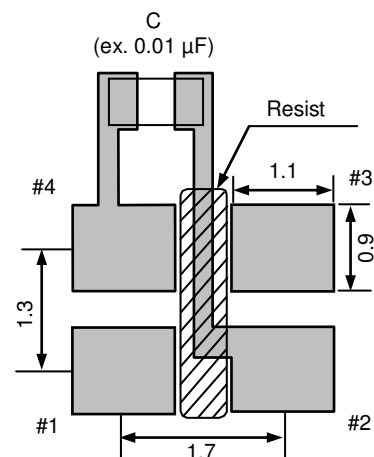
(Unit:mm)



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

## Footprint (Recommended)

(Unit:mm)



To maintain stable operation, provide a 0.01 $\mu$ F to 0.1 $\mu$ F by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between  $V_{CC}$  - GND).