

**CRYSTAL OSCILLATOR  
SPXO**

**SG-310 series**

- Frequency range : 2 MHz to 48 MHz
- Supply voltage : 1.8 V Typ. / 2.5 V Typ. / 3.3 V Typ.
- Current consumption : SEF1.8 V No load condition 48 MHz  
1.5 mA Typ.
- Function : Standby( $\overline{ST}$ )
- Thickness : 1.05 mm Typ.



Actual size

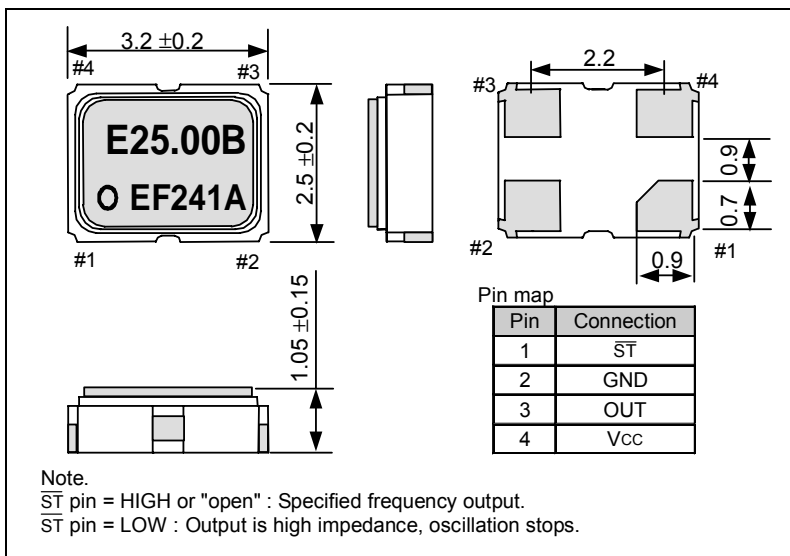


**Specifications (characteristics)**

Item	Symbol	Specifications					Remarks
		SG-310 SEF	SG-310 SDF	SG-310 SCF	SG-310 SDN	SG-310 SCN	
Output frequency range	$f_0$	2.000 MHz to 48.000 MHz			3.000 MHz to 48.000 MHz		
Supply voltage	$V_{CC}$	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	2.5 V Typ. 2.2 V to 2.7 V	3.3 V Typ. 2.7 V to 3.6 V	
Temperature range	Storage temperature	-40 °C to +125 °C					Store as bare product after unpacking
	Operating temperature	-40 °C to +85 °C					
Frequency tolerance	$F_{tol}$ (osc)	B: $\pm 50 \times 10^{-6}$ , C: $\pm 100 \times 10^{-6}$			-		-20 °C to +70 °C
		M: $\pm 100 \times 10^{-6}$			-		-40 °C to +85 °C
		-			D: $\pm 20 \times 10^{-6}$ , S: $\pm 25 \times 10^{-6}$		-20 °C to +70 °C
		-			R: $\pm 25 \times 10^{-6}$		-30 °C to +85 °C
		-			P: $\pm 20 \times 10^{-6}$ J: $\pm 25 \times 10^{-6}$		-30 °C to +85 °C
Current consumption	$I_{CC}$	1.5 mA Max.	1.5 mA Max.	1.5 mA Max.	-		No load condition, 2 MHz <math>f_0 \leq 4 MHz
		1.5 mA Max.	1.5 mA Max.	2.0 mA Max.	-		No load condition, 4 MHz <math>f_0 \leq 8 MHz
		1.5 mA Max.	2.0 mA Max.	2.5 mA Max.	-		No load condition, 8 MHz <math>f_0 \leq 16 MHz
		2.0 mA Max.	2.0 mA Max.	2.5 mA Max.	-		No load condition, 16 MHz <math>f_0 \leq 25 MHz
		2.0 mA Max.	2.5 mA Max.	3.5 mA Max.	-		No load condition, 25 MHz <math>f_0 \leq 33 MHz
		3.0 mA Max.	3.5 mA Max.	4.5 mA Max.	-		No load condition, 33 MHz <math>f_0 \leq 48 MHz
Stand-by current	$I_{std}$	0.7 $\mu$ A Max. (0.2 $\mu$ A Typ.)	1.5 $\mu$ A Max. (0.5 $\mu$ A Typ.)	2.0 $\mu$ A Max. (1.0 $\mu$ A Typ.)	1.5 $\mu$ A Max.	3.0 $\mu$ A Max.	$\overline{ST}$ = GND
Symmetry	SYM	45 % to 55 %	45 % to 55 %	45 % to 55 %	45 % to 55 %		2 MHz <math>f_0 \leq 16 MHz
		40 % to 60 %	40 % to 60 %	40 % to 60 %	40 % to 60 %		16 MHz <math>f_0 \leq 40 MHz 40 MHz <math>f_0 \leq 48 MHz
High output voltage	$V_{OH}$	90 % $V_{CC}$ Min.					$I_{OH} = -3$ mA
Low output voltage	$V_{OL}$	10 % $V_{CC}$ Max.					$I_{OL} = 3$ mA
Output load condition (CMOS)	$L_{CMOS}$	15 pF Max.					
Output enable / disable input voltage	$V_{IH}$	80 % $V_{CC}$ Min.			70 % $V_{CC}$ Min.		$\overline{ST}$ terminal
	$V_{IL}$	20 % $V_{CC}$ Max.			30 % $V_{CC}$ Max.		
Output rise and fall time	tr/ tf	4 ns Max.					20 % $V_{CC}$ to 80 % $V_{CC}$ level, $L_{CMOS} = 15$ pF
Oscillation start up time	$t_{osc}$	10 ms Max.			2 ms Max.		t=0 at 90 % $V_{CC}$
Frequency aging	$F_{aging}$	$\pm 5 \times 10^{-6}$ / year Max.			$\pm 3 \times 10^{-6}$ / year Max.		+25 °C, First year, $V_{CC} = 1.8$ V, 2.5 V, 3.3 V

**External dimensions**

(Unit:mm)



**Footprint (Recommended)**

(Unit:mm)

