

# CRYSTAL OSCILLATOR (SPXO)

## OUTPUT : CMOS

# SG-210 STF

- Frequency range : 1 MHz to 75 MHz
- Supply voltage : 1.8 V to 3.3 V Typ.
- Function : Standby( $\overline{ST}$ )
- External dimensions : 2.5 × 2.0 × 0.8 mm
- Operation temperature : -40 °C to +105 °C



Product Number (please contact us)  
X1G004171xxxx00



Actual size

### Specifications (characteristics)

Item	Symbol	Specifications	Conditions / Remarks		
Output frequency range	$f_o$	1 MHz to 75 MHz	Please contact us about available frequencies.		
Supply voltage	$V_{CC}$	1.60 V to 3.63 V	1 MHz $\leq f_o \leq$ 60 MHz, $T_{use} = +105^\circ\text{C}$ Max.		
		1.71 V to 3.63 V	60 MHz $< f_o \leq$ 75 MHz, $T_{use} = +85^\circ\text{C}$ Max.		
		2.25 V to 3.63 V	60 MHz $< f_o \leq$ 75 MHz, $T_{use} = +105^\circ\text{C}$ Max.		
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	See of figure *1		
Frequency tolerance	$f_{tol}$	S: $\pm 25 \times 10^{-6}$	-20 °C to +70 °C		
		L: $\pm 50 \times 10^{-6}$	-40 °C to +85 °C		
		Y: $\pm 50 \times 10^{-6}$ , W: $\pm 100 \times 10^{-6}$	-40 °C to +105 °C		
Current consumption	$I_{CC}$	$V_{CC} = 1.8 \text{ V} \pm 10\%$	$V_{CC} = 2.5 \text{ V} \pm 10\%$	$V_{CC} = 3.3 \text{ V} \pm 10\%$	No load condition, 1 MHz $< f_o \leq$ 20 MHz
		1.5 mA Max.	1.6 mA Max.	1.8 mA Max.	No load condition, 20 MHz $< f_o \leq$ 40 MHz
		1.8 mA Max.	2.0 mA Max.	2.2 mA Max.	No load condition, 40 MHz $< f_o \leq$ 60 MHz
		2.1 mA Max.	2.4 mA Max.	2.6 mA Max.	No load condition, 60 MHz $< f_o \leq$ 75 MHz
		2.4 mA Max.	2.8 mA Max.	3.0 mA Max.	$\overline{ST} = \text{GND}$
Stand-by current	$I_{std}$	2.1 $\mu\text{A}$ Max.	2.5 $\mu\text{A}$ Max.	2.7 $\mu\text{A}$ Max.	
Symmetry	SYM	45 % to 55 %	50 % $V_{CC}$ level, $L_{CMOS} \leq 15 \text{ pF}$		
Output voltage	$V_{OH}$	$V_{CC} - 0.4 \text{ V Min.}$			
	$V_{OL}$	0.4 V Max.			
Output load condition (CMOS)	$L_{CMOS}$		1.8 V $\pm 10\%$	2.5 V $\pm 10\%$	3.3 V $\pm 10\%$
		$I_{OH}$	-3 mA	-4 mA	-6 mA
		$I_{OL}$	3 mA	4 mA	6 mA
Input voltage	$V_{IH}$	80 % $V_{CC}$ Min.			
	$V_{IL}$	20 % $V_{CC}$ Max.			
Rise time and Fall time	$tr/ tf$	3 ns Max.			
		3.5 ns Max. (@1.8 V $\pm 10\%$ )			
Start-up time	$t_{str}$	3 ms Max.	t=0 at 90 % $V_{CC}$		
Frequency aging	$f_{aging}$	$\pm 3 \times 10^{-6}$ / year Max.	+25 °C, First year		
Phase noise	C/N	-145 dBc/Hz Typ.	@1 kHz, $f_o = 48 \text{ MHz}$		
		-158 dBc/Hz Typ.	@100 kHz, $f_o = 48 \text{ MHz}$		
		-161 dBc/Hz Typ.	@Floor Lv.		

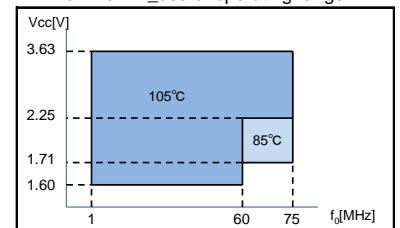
Product Name  
(Standard form)

SG-210 S T F 25.000000MHz L  
 ① Model ② Function (S:Standby)  
 ③ Supply voltage ④ Frequency  
 ⑤ Frequency tolerance

③ Supply voltage	
T	1.60 to 3.63 V See of figure *1

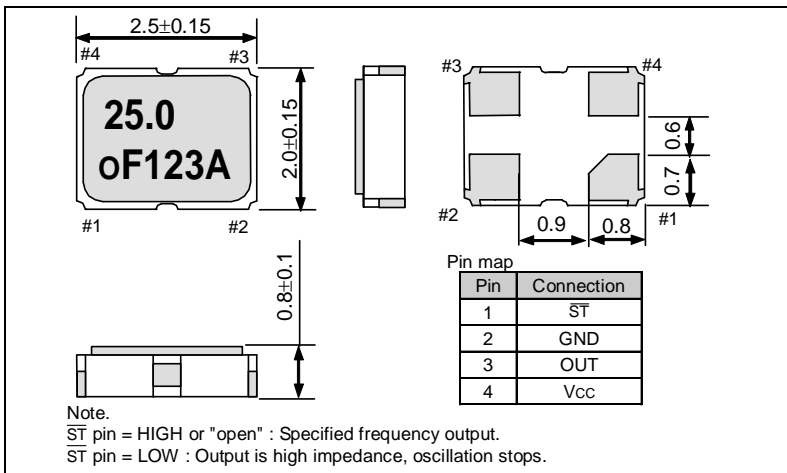
⑤ Frequency tolerance	
S	$\pm 25 \times 10^{-6}$ / -20 °C to +70 °C
L	$\pm 50 \times 10^{-6}$ / -40 °C to +85 °C
Y	$\pm 50 \times 10^{-6}$ / -40 °C to +105 °C
W	$\pm 100 \times 10^{-6}$ / -40 °C to +105 °C

\*1 : Maximum  $T_{use}$  of operating range



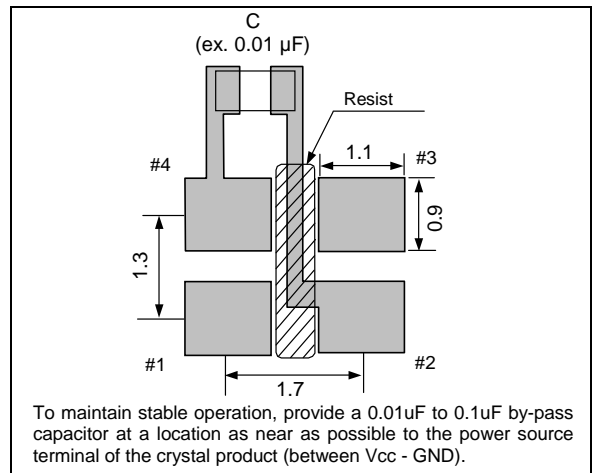
### External dimensions

(Unit:mm)



### Footprint (Recommended)

(Unit:mm)



## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

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In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

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### ► Explanation of the mark that are using it for the catalog

	► Pb free.
	► 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.)
	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).

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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

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