

# CRYSTAL OSCILLATOR (SPXO)

OUTPUT : CMOS

Low Jitter

## SG-210S\*H

- Frequency range : 80.000 MHz to 170.000 MHz  
Fundamental mode oscillator
- Supply voltage : 1.8 V Typ. / 2.5 V Typ. / 3.3 V Typ.
- Output : CMOS
- Function : Standby( $\overline{ST}$ )
- External dimensions : 2.5 × 2.0 × 0.8 mm



Product Number (please contact us)  
 SG-210SCH: X1G003931xxxx00  
 SG-210SDH: X1G003941xxxx00  
 SG-210SEH: X1G003951xxxx00



Actual size

### Specifications (characteristics)

| Item                         | Symbol  | Specifications  |             |              | Conditions / Remarks                           |
|------------------------------|---------|---|-------------|--------------|--|
|                              |         | SG-210SEH   | SG-210SDH   | SG-210SCH    |  |
| Output frequency range       | fo      | 80.000 MHz to 170.000 MHz                               |             |              | Please contact us about available frequencies. |
|                              |         | 100MHz, 106.25MHz, 125MHz, 133.33MHz, 150MHz, 156.25MHz |             |              | Standard frequency. *1                         |
| Supply voltage               | Vcc     | 1.8 V ± 10%   | 2.5 V ± 10% | 3.3 V ± 10%  | *2   |
| Storage temperature          | T_stg   | -40 °C to +125 °C                                       |             |              | Storage as single product.                     |
| Operating temperature        | T_use   | -40 °C to +85 °C  |             |              |  |
| Frequency tolerance          | f_tol   | B: ±50 × 10 <sup>-6</sup> , C: ±100 × 10 <sup>-6</sup>  |             |              | -20 °C to +70 °C                               |
|                              |         | L: ±50 × 10 <sup>-6</sup> , M: ±100 × 10 <sup>-6</sup>  |             |              | -40 °C to +85 °C                               |
| Current consumption          | Icc     | 6.0 mA Max.   | 7.0 mA Max. | 9.0 mA Max.  | No load condition, 80 MHz ≤ fo ≤ 125 MHz       |
|                              |         | 8.0 mA Max.   | 9.0 mA Max. | 11.0 mA Max. | No load condition, 125 MHz < fo ≤ 170 MHz      |
| Stand-by current             | I_std   | 10.0 µA Max.  |             |              | $\overline{ST}$ = GND                          |
| Symmetry                     | SYM     | 45 % to 55 %  |             |              | 50 % Vcc level, L_CMOS ≤ 15 pF                 |
| Output voltage               | VoH     | 90 % Vcc Min.   |             |              | IoH = -4mA                                     |
|                              | VoL     | 10 % Vcc Max.   |             |              | IoL = 4mA                                      |
| Output load condition (CMOS) | L_CMOS  | 15 pF Max.  |             |              |  |
| Input voltage                | ViH     | 80 % Vcc Min.   |             |              | $\overline{ST}$ terminal                       |
|                              | ViL     | 20 % Vcc Max.   |             |              |  |
| Rise time / Fall time        | tr/ tr  | 3 ns Max.   | 2 ns Max.   |              | 20 % Vcc to 80 % Vcc level, L_CMOS ≤ 15 pF     |
| Start-up time                | t_str   | 5 ms Max.   |             |              | T=0 at 90 % Vcc                                |
| Frequency aging              | f_aging | ±5 × 10 <sup>-6</sup> / year Max.                       |             |              | +25 °C, First year                             |
| Jitter *3                    | tp-p    | 22 ps Typ.  | 20 ps Typ.  |              | Peak to Peak                                   |
| Phase Jitter                 | tpj     | 0.7 ps Max.   | 0.6 ps Max. |              | Offset frequency:<br>12kHz to 20MHz            |

\*1 Please contact us for requirements not listed in the specification.

\*2 fo ≥ 157MHz: Vcc ± 5%

\*3 Based on SIA-3100C signal integrity analyzer made from WAVECREST.

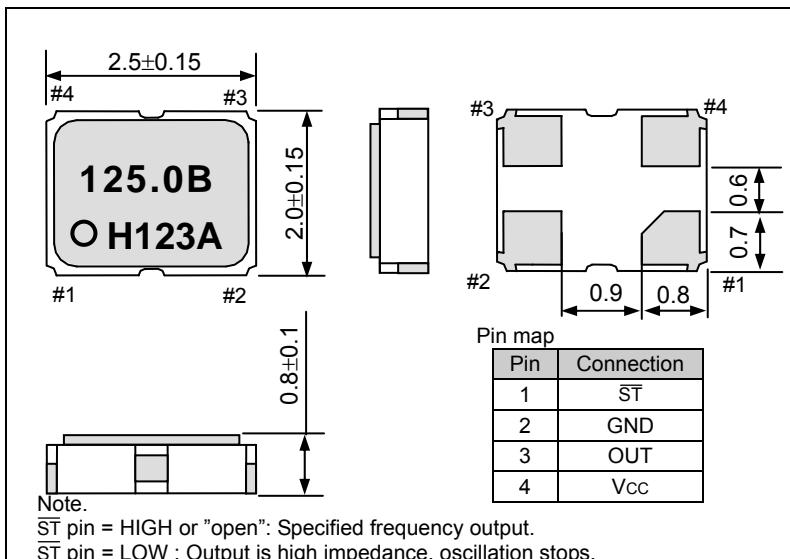
Product Name SG-210 S E H 125.000000MHz L  
 (Standard form) ① ②③ ④ ⑤  
 ①Model ②Function (S:Standby) ③Supply voltage  
 ④Frequency ⑤Frequency tolerance

| ③Supply voltage |            |
|-----------------|------------|
| E               | 1.8 V Typ. |
| D               | 2.5 V Typ. |
| C               | 3.3 V Typ. |

| ⑤Frequency tolerance |  |
|----------------------|--|
| B                    | ±50 × 10 <sup>-6</sup> / -20 to +70°C  |
| C                    | ±100 × 10 <sup>-6</sup> / -20 to +70°C |
| L                    | ±50 × 10 <sup>-6</sup> / -40 to +85°C  |
| M                    | ±100 × 10 <sup>-6</sup> / -40 to +85°C |

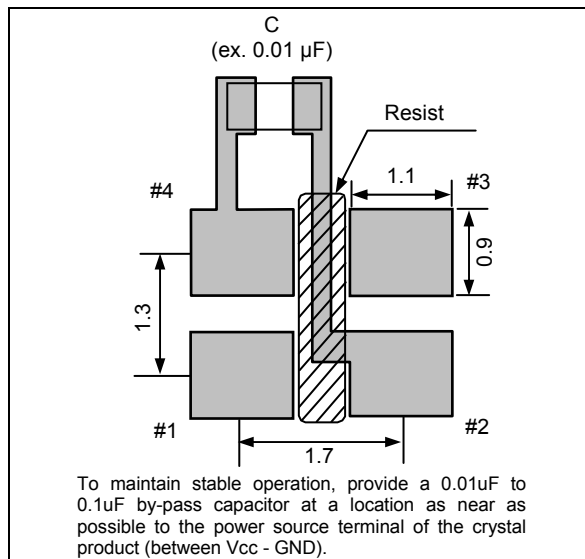
### External dimensions

(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.





## WORKING FOR HIGH QUALITY

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.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

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

|   |   |
|---|---|
|  | ► Pb free.  |
|  | ► Complies with EU RoHS directive.<br>*About the products without the Pb-free mark.<br>Contains Pb in products exempted by EU RoHS directive.<br>(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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