



## CRYSTAL OSCILLATOR (SPXO)

OUTPUT : CMOS

HIGH-STABILITY

## HG-2150CA series

- Frequency range : 1 MHz to 60 MHz
- Supply voltage : 3.3 V Typ. / 5.0 V Typ.
- Frequency tolerance :  $\pm 15 \times 10^{-6}$  / -20 °C to +70 °C
- Function : Output enable (OE)
- External dimensions : 7.0 × 5.0 × 1.4 mm



Product Number (please contact us)  
Q3514CA00xxx00



Actual size



## Specifications (characteristics)

| Item                   | Symbol                          | Specifications                        |                | Conditions / Remarks                               |
|------------------------|---------------------------------|---------------------------------------|----------------|--|
|                        |                                 | SVH / BXH                             | SVC / BXC      |  |
| Output frequency range | f <sub>0</sub>                  | 1.000 MHz to 60.000 MHz               |                | Please contact us about available frequencies.     |
| Supply voltage         | V <sub>cc</sub>                 | H:5.0 V ±0.5 V                        | C:3.3 V ±0.3 V |  |
| Storage temperature    | T <sub>stg</sub>                | -40 °C to +125 °C                     |                | Storage as single product.                         |
| Operating temperature  | T <sub>use</sub>                | V:-20 °C to +70 °C X:-40 °C to +85 °C |                |  |
| Frequency tolerance    | f <sub>tol</sub>                | S: ±15 × 10 <sup>-6</sup> *1          |                | -20 °C to +70 °C                                   |
|                        |                                 | B: ±25 × 10 <sup>-6</sup> *1          |                | -40 °C to +85 °C                                   |
| Current consumption    | I <sub>cc</sub>                 | 30 mA Max.                            | 25 mA Max.     | No load condition, OE = V <sub>cc</sub>            |
| Disable current        | I <sub>dis</sub>                | 15 mA Max.                            | 12 mA Max.     | OE=GND   |
| Symmetry               | SYM                             | 45 % to 55 %                          |                | 50 % V <sub>cc</sub> level                         |
| Output voltage         | V <sub>OH</sub>                 | V <sub>cc</sub> -0.4 V Min.           |                | I <sub>OH</sub> =-4 mA                             |
|                        | V <sub>OL</sub>                 | 0.4 V Max.                            |                | I <sub>OL</sub> = 4 mA                             |
| Output load condition  | L <sub>CMOS</sub>               | 15 pF Max.                            |                | CMOS load  |
| Input voltage          | V <sub>IH</sub>                 | 70 % V <sub>cc</sub> Min.             |                | OE terminal  |
|                        | V <sub>IL</sub>                 | 30 % V <sub>cc</sub> Max.             |                |  |
| Rise time / Fall time  | t <sub>r</sub> / t <sub>f</sub> | 4 ns Max.                             |                | 20 % V <sub>cc</sub> to 80 % V <sub>cc</sub> level |
| Start-up time          | t <sub>str</sub>                | 10 ms Max.                            |                | Time at minimum supply voltage to be 0 s.          |
| Frequency aging        | f <sub>aging</sub>              | ±10 × 10 <sup>-6</sup> Max. *2        |                | +25 °C, 10 years                                   |

\*1 Frequency tolerance includes variation in reflow soldering drift, operating temperature range, supply voltage range and load change.

\*2 50 MHz < f<sub>0</sub> ≤ 60 MHz:  $\pm 15 \times 10^{-6}$  Max.

Product Name                      HG-2150CA 35.328000MHz S V H  
(Standard form)                      ①                      ②                      ③④⑤

①Model    ②Frequency    ③Frequency tolerance    ④Operating temperature    ⑤Supply voltage

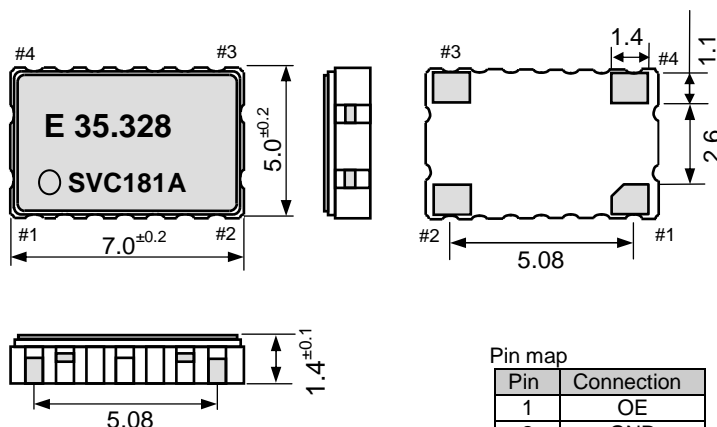
| ③Frequency tolerance |  |
|----------------------|--|
| S                    | $\pm 15 \times 10^{-6}$ / -20 to +70°C |
| B                    | $\pm 25 \times 10^{-6}$ / -40 to +85°C |

| ④Operating temperature |              |
|------------------------|--------------|
| V                      | -20 to +70°C |
| X                      | -40 to +85°C |

| ⑤Supply voltage |            |
|-----------------|------------|
| C               | 3.3 V Typ. |
| H               | 5.0 V Typ. |

## External dimensions

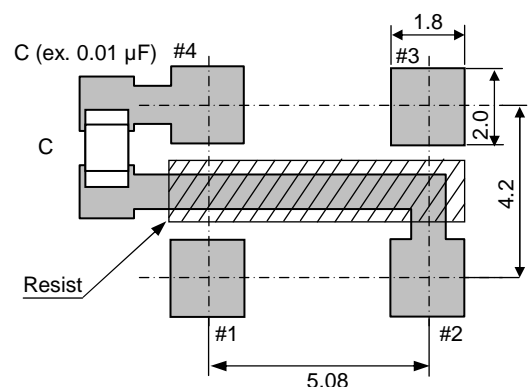
(Unit:mm)



Note.  
OE Pin  
OE pin = "H" or "open" : Specified frequency output.  
OE pin = "L" : Output is high impedance

## Footprint (Recommended)

(Unit:mm)



To maintain stable operation, provide a 0.01µF to 0.1µF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between V<sub>cc</sub> - GND).

## 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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