

**VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO)**

**OUTPUT : LV-PECL**



Product Number (Please contact us)  
**VG-4513CB: X1G004151xxxxxx**  
**VG-4513CA: X1G004141xxxxxx**

**VG-4513CB**  
**VG-4513CA**

- Frequency range : 100 MHz to 250 MHz
- Supply voltage : 3.3 V
- Absolute pull range :  $\pm 30 \times 10^{-6}$  Min,  $\pm 50 \times 10^{-6}$  Min,  $\pm 100 \times 10^{-6}$  Min
- Function : Output Enable(OE)  
Active High or Low
- Output : LV-PECL



VG-4513CB  
(5.0 × 3.2 × 1.3 mm)



VG-4513CA  
(7.0 × 5.0 × 1.6 mm)

Actual size

VG-4513CB

VG-4513CA

**Specifications (characteristics)**

| Item                        | Symbol                         | Specifications  | Conditions / Remarks   |
|-----------------------------|--------------------------------|---|--|
| Output frequency range      | f <sub>o</sub>                 | 100.000 MHz to 250.000 MHz  | Please contact us about available frequencies.   |
| Supply voltage              | V <sub>cc</sub>                | 3.3 V ± 0.165 V   |  |
| Storage temperature range   | T <sub>stg</sub>               | -55 °C to +125 °C   |  |
| Operating temperature range | T <sub>use</sub>               | -40 °C to +85 °C  |  |
| Current consumption         | I <sub>cc</sub>                | 65 mA Max.  |  |
| Frequency tolerance         | f <sub>tol</sub>               | 100 MHz ≤ f <sub>o</sub> ≤ 200 MHz : ±50 × 10 <sup>-6</sup> Max.<br>200 MHz < f <sub>o</sub> ≤ 250 MHz : ±70 × 10 <sup>-6</sup> Max.  | Includes initial tolerance, temperature change, V <sub>cc</sub> change and 10years aging |
| Absolute pull range         | APR                            | 120 MHz ≤ f <sub>o</sub> ≤ 200 MHz<br>±30 × 10 <sup>-6</sup> Min. ±50 × 10 <sup>-6</sup> Min. ±100 × 10 <sup>-6</sup> Min.<br>100 MHz ≤ f <sub>o</sub> < 120 MHz, 200 MHz < f <sub>o</sub> ≤ 250 MHz<br>±30 × 10 <sup>-6</sup> Min. ±50 × 10 <sup>-6</sup> Min. | V <sub>c</sub> = 1.65 V ± 1.65 V   |
| Input resistance            | R <sub>in</sub>                | 100 kΩ Min.   | DC level   |
| Output load condition       | L <sub>ECL</sub>               | 50Ω at V <sub>cc</sub> -2.0V  |  |
| High output voltage         | V <sub>OH</sub>                | V <sub>cc</sub> -1.1 V Min.   |  |
| Low output voltage          | V <sub>OL</sub>                | V <sub>cc</sub> -1.5 V Max.   |  |
| Symmetry                    | SYM                            | 40 % to 60 %  | at V <sub>cc</sub> -1.30 V, V <sub>c</sub> =1/2V <sub>cc</sub>                           |
| Rise/Fall times             | t <sub>r</sub> /t <sub>f</sub> | 0.5 ns Max.   | at 20 % to 80 % output swing   |
| High input voltage          | V <sub>IH</sub>                | 70% V <sub>cc</sub> Min.  |  |
| Low input voltage           | V <sub>IL</sub>                | 30% V <sub>cc</sub> Max.  |  |
| Oscillation start up time   | t <sub>str</sub>               | 10ms Max.   |  |

| Item  | Offset frequency | 122.88 MHz  | 153.6 MHz   | 245.76 MHz  |
|---|------------------|-------------|-------------|-------------|
| Phase noise<br>(Typical value)<br>APR ±50 × 10 <sup>-6</sup> Min. | 10 Hz            | -75 dBc/Hz  | -70 dBc/Hz  | -64 dBc/Hz  |
|   | 100 Hz           | -105 dBc/Hz | -100 dBc/Hz | -94 dBc/Hz  |
|   | 1 kHz            | -129 dBc/Hz | -124 dBc/Hz | -118 dBc/Hz |
|   | 10 kHz           | -147 dBc/Hz | -143 dBc/Hz | -138 dBc/Hz |
|   | 100 kHz          | -151 dBc/Hz | -152 dBc/Hz | -149 dBc/Hz |

Product Name **VG-4513CA - 122.880000 - G F C T**

(Standard form) ① ② ③ ④⑤⑥⑦

- ①Model ②Package type ③Frequency(MHz) ④Operating temperature range ⑤Absolute pull range  
 ⑥Supply voltage (C: 3.3V Typ.) ⑦OE function

④Operating temperature

|   |              |
|---|--------------|
| G | -40 to +85°C |
| J | -20 to +70°C |
| K | 0 to +70°C   |

⑤Absolute pull range

|    |                              |
|----|------------------------------|
| H* | ±100 × 10 <sup>-6</sup> Min. |
| G  | ±50 × 10 <sup>-6</sup> Min.  |
| F  | ±30 × 10 <sup>-6</sup> Min.  |

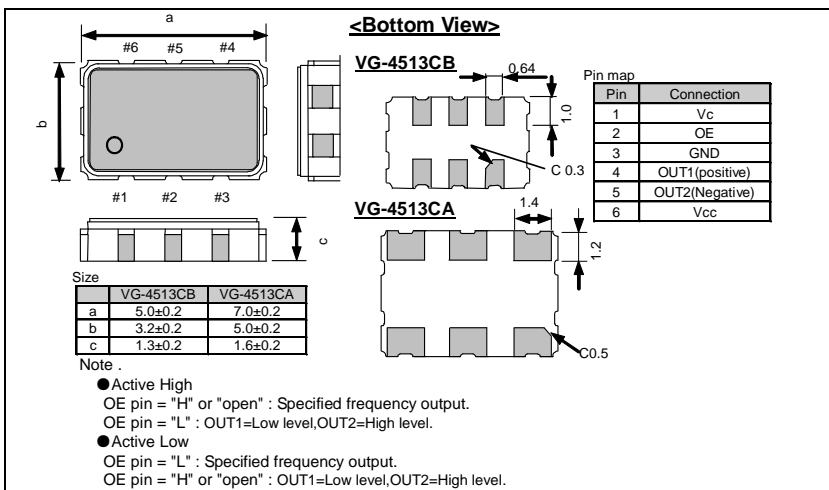
⑦OE function

|   |             |
|---|-------------|
| T | Active High |
| L | Active Low  |

\*Only 120 MHz ≤ f<sub>o</sub> ≤ 200 MHz are available.

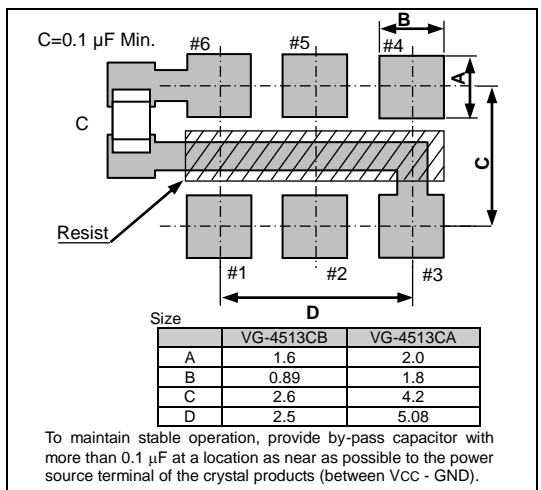
**External dimensions**

(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,

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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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Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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