

**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

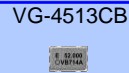


VG-4513CB  
(5.0 × 3.2 × 1.3 mm)



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	$f_o$	100.000 MHz to 250.000 MHz	Please contact us about available frequencies.
Supply voltage	$V_{cc}$	3.3 V $\pm$ 0.165 V	
Storage temperature range	$T_{stg}$	-55 °C to +125 °C	
Operating temperature range	$T_{use}$	-40 °C to +85 °C	
Current consumption	$I_{cc}$	65 mA Max.	
Frequency tolerance	$f_{tol}$	100 MHz $\leq f_o \leq$ 200 MHz : $\pm 50 \times 10^{-6}$ Max. 200 MHz $< f_o \leq$ 250 MHz : $\pm 70 \times 10^{-6}$ Max.	Includes initial tolerance, temperature change, $V_{cc}$ change and 10years aging
Absolute pull range	APR	120 MHz $\leq f_o \leq$ 200 MHz $\pm 30 \times 10^{-6}$ Min. $\pm 50 \times 10^{-6}$ Min. $\pm 100 \times 10^{-6}$ Min. 100 MHz $\leq f_o <$ 120 MHz, 200 MHz $< f_o \leq$ 250 MHz $\pm 30 \times 10^{-6}$ Min. $\pm 50 \times 10^{-6}$ Min.	$V_c = 1.65 V \pm 1.65 V$
Input resistance	$R_{in}$	100 k $\Omega$ Min.	DC level
Output load condition	$L_{ECL}$	50 $\Omega$ at $V_{cc} - 2.0V$	
High output voltage	$V_{OH}$	$V_{cc} - 1.1 V$ Min.	
Low output voltage	$V_{OL}$	$V_{cc} - 1.5 V$ Max.	
Symmetry	SYM	40 % to 60 %	at $V_{cc} - 1.30 V$ , $V_c = 1/2V_{cc}$
Rise/Fall times	$t_r/t_f$	0.5 ns Max.	at 20 % to 80 % output swing
High input voltage	$V_{IH}$	70% $V_{cc}$ Min.	
Low input voltage	$V_{IL}$	30% $V_{cc}$ Max.	
Oscillation start up time	$t_{str}$	10ms Max.	

Item	Offset frequency	122.88 MHz	153.6 MHz	245.76 MHz
Phase noise (Typical value) APR $\pm 50 \times 10^{-6}$ 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-4513 CA - 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

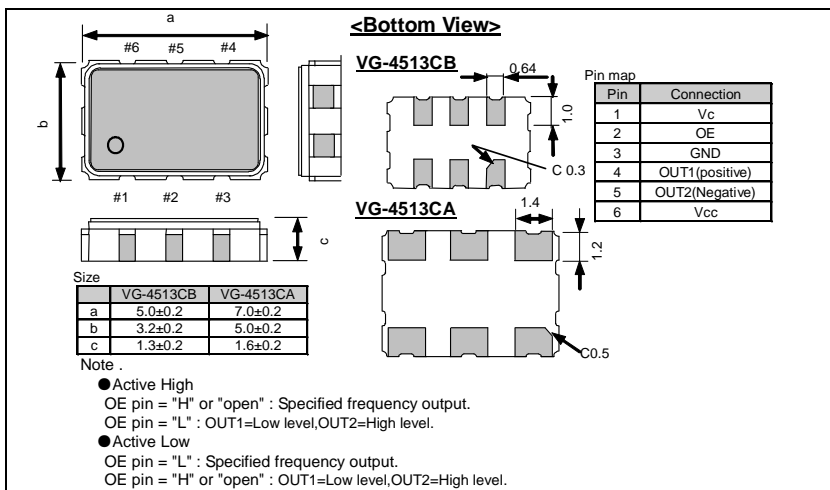
⑤Absolute pull range	
H*	$\pm 100 \times 10^{-6}$ Min.
G	$\pm 50 \times 10^{-6}$ Min.
F	$\pm 30 \times 10^{-6}$ Min.

⑦OE function	
T	Active High
L	Active Low

\*Only 120 MHz  $\leq f_o \leq$  200 MHz are available.

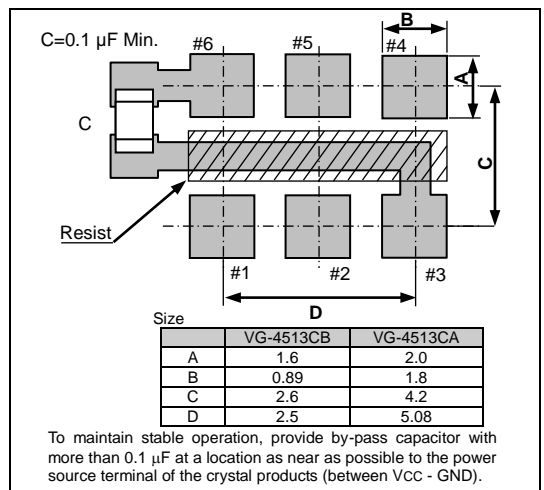
**External dimensions**

(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.

## 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. *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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