

**VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO)**  
**OUTPUT : CMOS**



Product Number (please contact us)  
 VG-4231CA: Q3614CA00xxxx00  
 VG-4232CA: X1G003921xxxx00

**VG-4231CA**  
**VG-4232CA**

- Frequency range : 1 MHz to 80 MHz
- Supply voltage : 3.3 V / 5.0V ... VG-4231CA  
 3.3 V ... VG-4232CA
- Absolute pull range :  $\pm 80 \times 10^{-6}$ ,  $\pm 65 \times 10^{-6}$ ... VG-4231CA  
 $\pm 50 \times 10^{-6}$  ... VG-4232CA
- External dimensions : 7.0 x 5.0 x 1.4 mm



Actual size



**Specifications (characteristics)**

| Item                       | Symbol                             | VG-4231CA  | VG-4232CA  | Conditions / Remarks   |
|----------------------------|------------------------------------|--|--|--|
| Output frequency range     | f <sub>o</sub>                     | 1.000 MHz to 60.000 MHz                                    | 60.001 MHz to 80.000 MHz                               | Please contact us about available frequencies.   |
| Supply voltage             | V <sub>cc</sub>                    | H:5.0 V $\pm$ 0.5 V, C:3.3 V $\pm$ 0.3 V                   | C:3.3 V $\pm$ 0.165 V                                  |  |
| Control voltage            | V <sub>c</sub>                     | H:2.5 V $\pm$ 2.0 V, C:1.65 V $\pm$ 1.5 V                  | 1.65 V $\pm$ 1.65 V                                    |  |
| Storage temperature        | T <sub>stg</sub>                   | -40 °C to +125 °C  | -55 °C to +125 °C                                      | Storage as single product.   |
| Operating temperature      | T <sub>use</sub>                   | As per table below   |  |  |
| Frequency tolerance        | f <sub>tol</sub>                   | As per table below   |  | V <sub>c</sub> =2.5 V(**H), V <sub>c</sub> =1.65 V(**C)  |
| Current consumption        | I <sub>cc</sub>                    | H:20 mA Max., C: 10 mA Max.                                | 35mA Max.  | No load condition  |
| Disable current            | I <sub>dis</sub>                   | H:15 mA Max., C: 7 mA Max.                                 | 25mA Max.  | OE=GND   |
| Frequency control range    | F <sub>cont</sub>                  | $\pm 130 \times 10^{-6}$                                   |  |  |
| Absolute pull range *1     | APR                                | $\pm 80 \times 10^{-6}$ Min., $\pm 65 \times 10^{-6}$ Min. | $\pm 50 \times 10^{-6}$ Min.                           |  |
| Modulation characteristics | BW                                 | 15 kHz Min.  | 5 kHz Min.   | $\pm 3$ dB (at 1 kHz)  |
| Input resistance           | R <sub>in</sub>                    | 50 k $\Omega$ Min.<br>H: — , C:10 M $\Omega$ Min.          | 80 k $\Omega$ Min.                                     | F or T Type<br>M or Z Type   |
| Frequency change polarity  | —                                  | Positive polarity  |  |  |
| Symmetry                   | SYM                                | 40 % to 60 %   | 45 % to 55 %   | CMOS load: 50 % V <sub>cc</sub> level  |
| Output voltage             | V <sub>OH</sub><br>V <sub>OL</sub> | V <sub>cc</sub> -0.4 V Min.<br>0.4 V Max.                  | 90 % V <sub>cc</sub> Min.<br>10 % V <sub>cc</sub> Max. | I <sub>OH</sub> =-4 mA(**H), I <sub>OH</sub> =-0.8 mA(**C)<br>I <sub>OL</sub> =4 mA(**H), I <sub>OL</sub> =3.2 mA(**C) |
| Output load condition      | L <sub>CMOS</sub>                  | 15 pF Max.   |  | CMOS load  |
| Input voltage              | V <sub>IH</sub><br>V <sub>IL</sub> | 70 % V <sub>cc</sub> Min.<br>30 % V <sub>cc</sub> Max.     |  | OE terminal  |
| Rise time and Fall time    | t <sub>r</sub> / t <sub>f</sub>    | 4 ns Max.  | 5 ns Max.  | CMOS load: 20 % V <sub>cc</sub> to 80 % V <sub>cc</sub> level  |
| Start-up time              | t <sub>str</sub>                   | 10 ms Max.   |  | Time at 90 % V <sub>cc</sub> to be 0s  |
| Frequency aging            | f <sub>aging</sub>                 | $\pm 10 \times 10^{-6}$ Max.*2                             | Included in Frequency tolerance.                       | +25 °C, 10 years   |

\*1 Absolute pull range = Frequency control range- (Frequency tolerance + 10 years Aging + Free fall + Vibration) \*2 50 MHz < f<sub>o</sub>  $\leq$  60 MHz :  $\pm 15 \times 10^{-6}$  Max.

\* Please keep VC pin open or ground while powering up V<sub>cc</sub>.

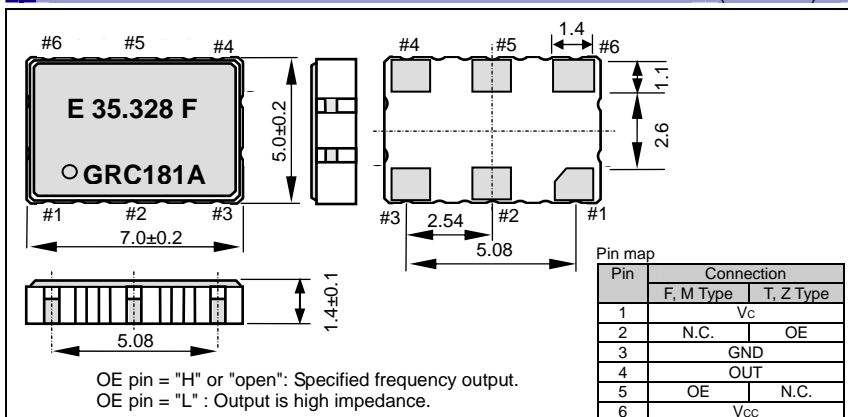
Product Name VG-4231 CA 35.328000MHz G R C - F VG-4232 CA 65.000000MHz J G C - F  
 (Standard form) ① ② ③ ④⑤⑥ ⑦ ① ② ③ ④⑤⑥ ⑦

- ①Model ②Package type ③Frequency ④Frequency tolerance / Operating temperature / (Absolute pull range)(Only VG-4231)
- ⑤Frequency control range(VG-4231), Absolute pull range(VG-4232) ⑥Supply voltage
- ⑦Input resistance / OE pin# (Refer to specification table and Pin map)

| Model | ④Frequency tolerance / Operating temperature / Absolute pull range       | ⑤Frequency control range                | ⑥Supply voltage          |                              |
|-------|--|---|--------------------------|------------------------------|
|       |  |   | H                        | C                            |
| 4231  | G $\pm 50 \times 10^{-6}$ / -40 to +85 °C / $\pm 65 \times 10^{-6}$ Min. | R                                       | $\pm 130 \times 10^{-6}$ | 5.0V Typ.                    |
|       | D $\pm 35 \times 10^{-6}$ / -20 to +70 °C / $\pm 80 \times 10^{-6}$ Min. |   | 3.3 V Typ.               |                              |
| Model | ④Frequency tolerance / Operating temperature                             |   | ⑤ Absolute pull range    |                              |
|       | G  | $\pm 50 \times 10^{-6}$ / -40 to +85 °C | G                        | $\pm 50 \times 10^{-6}$ Min. |
|       | J  | $\pm 50 \times 10^{-6}$ / -20 to +70 °C |                          |                              |
| K     | $\pm 50 \times 10^{-6}$ / 0 to +70 °C                                    |   |                          |                              |

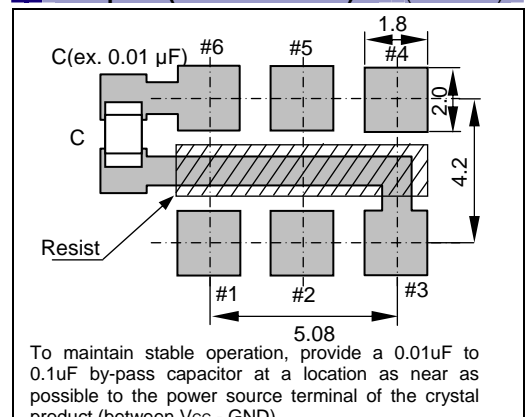
**External dimensions**

(Unit: mm)



**Footprint (Recommended)**

(Unit: mm)



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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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|   |   |
|---|---|
|  | ► 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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#### Как с нами связаться

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