VOLTAGE –CONTROLLED CRYSTAL OSCILLATOR (VCXO)
OUTPUT : CMOS

Pb Free RoHS Compliant

Product Number
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 : ±80 × 10⁻⁶, ±65 × 10⁻⁶ ··· VG-4231CA
  ±50 × 10⁻⁶ ··· VG-4232CA
- •External dimensions : 7.0 × 5.0 × 1.4 mm

Specifications (characteristics)

Item	Symbol	VG-4231CA	VG-4232CA	Conditions / Remarks
Output frequency range	fo	1.000 MHz to 60.000 MHz	60.001 MHz to 80.000 MHz	Please contact us about available frequencies.
Supply voltage	Vcc	H:5.0 V ±0.5 V, C:3.3 V ±0.3 V	C:3.3 V ±0.165 V	
Control voltage	Vc	H:2.5 V ±2.0 V, C:1.65 V ±1.5 V	1.65 V ±1.65 V	
Storage temperature	T_stg	-40 °C to +125 °C	-55 °C to +125 °C	Storage as single product.
Operating temperature	T_use	As per table below		
Frequency tolerance	f_tol	As per table below		Vc=2.5 V(**H), Vc=1.65 V(**C)
Current consumption	Icc	H:20 mA Max. , C: 10 mA Max.	35mA Max.	No load condition
Disable current	I_dis	H:15 mA Max. , C: 7 mA Max.	25mA Max.	OE=GND
Frequency control range	F_cont	±130 × 10⁻⁶	—	
Absolute pull range *1	APR	±80 × 10⁻⁶ Min., ±65 × 10⁻⁶ Min.	±50 × 10⁻⁶ Min.	
Modulation characteristics	BW	15 kHz Min.	5 kHz Min.	±3 dB (at 1 kHz)
Input resistance	Rin	50 kΩ Min.	80 kΩ Min.	F or T Type / DC Level
		H:— , C:10 MΩ Min.	—	M or Z Type / DC Level
Frequency change polarity	—	Positive polarity		
Symmetry	SYM	40 % to 60 %	45 % to 55 %	CMOS load: 50 % Vcc level
Output voltage	VOH	Vcc-0.4 V Min.	90 % Vcc Min.	IOH=-4 mA(**H), IOH=-0.8 mA(**C)
	VOL	0.4 V Max.	10 % Vcc Max.	IOL=4 mA(**H), IOL=3.2 mA(**C)
Output load condition	L_CMOS	15 pF Max.		CMOS load
Input voltage	VIH	70 % Vcc Min.		OE terminal
	VIL	30 % Vcc Max.		OE terminal
Rise time and Fall time	tr / tf	4 ns Max.	5 ns Max.	CMOS load: 20 % Vcc to 80 % Vcc level
Start-up time	t_str	10 ms Max.		Time at 90 % Vcc to be 0s
Frequency aging	f_age	±10 × 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 < fo ≤ 60 MHz :±15 × 10⁻⁶ Max.
* Please keep VC pin open or ground while powering up Vcc.

Product Name (Standard form)

VG-4231 CA 35.328000MHz G R C - F
① ② ③ ④⑤⑥ ⑦

VG-4232 CA 65.000000MHz J G C - F
① ② ③ ④⑤⑥ ⑦

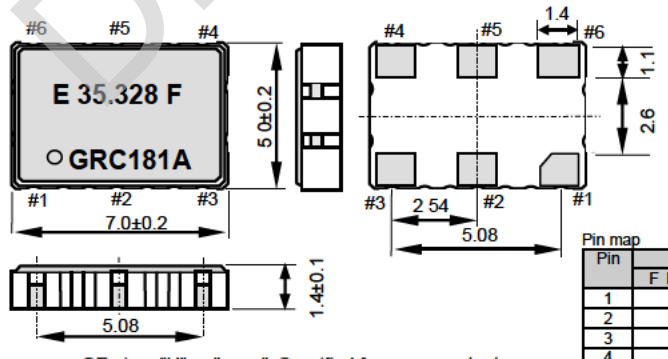
①Model ②Package type ③Frequency ④Frequency tolerance / Operating temperature / (Absolute pull range)(Only VG-4231)
⑤Frequency control range(VG-4231), Absolute pull range(VG-4232) ⑥Supply voltage
⑦Input resistance / OE pin# (Refer to specification table and Pin map)

Model	④Frequency tolerance / Operating temperature / Absolute pull range		⑤Frequency control range	
4231	G	±50 × 10⁻⁶ / −40 to +85 °C / ±65 × 10⁻⁶ Min.	R	±130 × 10⁻⁶
	D	±35 × 10⁻⁶ / −20 to +70 °C / ±80 × 10⁻⁶ Min.		

⑥Supply voltage	
H	5.0V Typ.
C	3.3 V Typ.

Model	④Frequency tolerance / Operating temperature		⑤ Absolute pull range	
4232	G	±50 × 10⁻⁶ / −40 to +85 °C	G	±50 × 10⁻⁶ Min.
	J	±50 × 10⁻⁶ / −20 to +70 °C		
	K	±50 × 10⁻⁶ / 0 to +70 °C		

External dimensions (Unit: mm)

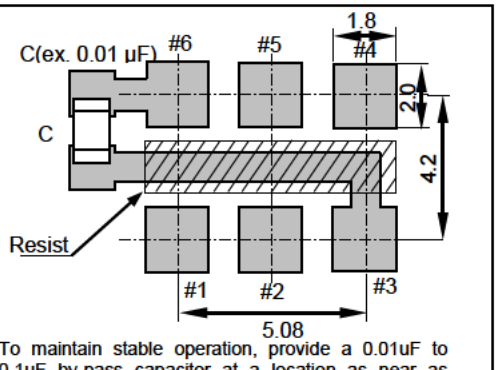


OE pin = "H" or "open": Specified frequency output.
OE pin = "L" : Output is high impedance.

Pin map

Pin	Connection	
	F_M Type	T_Z Type
1	Vc	
2	N.C.	OE
3	GND	
4	OUT	
5	OE	N.C.
6	Vcc	

Footprint (Recommended) (Unit: mm)



To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - 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 IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

IATF 16949 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	►Pb free.
RoHS Compliant	►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.)
For Automotive	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).