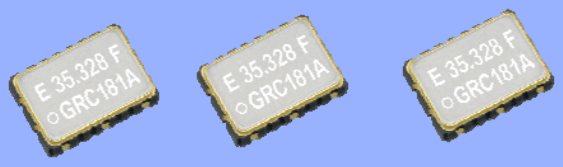
VOLTAGE –CONTROLLED CRYSTAL OSCILLATOR (VCXO)
OUTPUT : CMOS

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

Pb Free RoHS Compliant

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



Actual size

Specifications (characteristics)

Item	Symbol	VG-4231CA	VG-4232CA	Conditions / Remarks
Output frequency range	f_0	1.000 MHz to 60.000 MHz	60.001 MHz to 80.000 MHz	Please contact us about available frequencies.
Supply voltage	V_{CC}	H:5.0 V ±0.5 V, C:3.3 V ±0.3 V	C:3.3 V ±0.165 V	
Control voltage	V_C	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		V_C=2.5 V(**H), V_C=1.65 V(**C)
Current consumption	I_{CC}	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 % V_{CC} level
Output voltage	V_{OH}	V_{CC}-0.4 V Min.	90 % V_{CC} Min.	I_{OH}=-4 mA(**H), I_{OH}=-0.8 mA(**C)
	V_{OL}	0.4 V Max.	10 % V_{CC} Max.	I_{OL}=4 mA(**H), I_{OL}=3.2 mA(**C)
Output load condition	L_CMOS	15 pF Max.		CMOS load
Input voltage	V_{IH}	70 % V_{CC} Min.		OE terminal
	V_{IL}	30 % V_{CC} Max.		OE terminal
Rise time and Fall time	t_r / t_f	4 ns Max.	5 ns Max.	CMOS load: 20 % V_{CC} to 80 % V_{CC} level
Start-up time	t_str	10 ms Max.		Time at 90 % V_{CC} to be 0s
Frequency aging	f_aging	±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 < f_0 ≤ 60 MHz :±15 × 10^{-6} Max.
* Please keep VC pin open or ground while powering up V_{CC}.

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

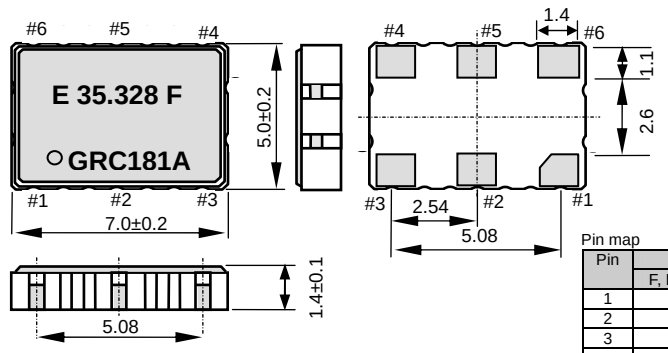
①Model ②Package type ③Frequency ④Frequency tolerance / Operating temperature / (Absolute pull range)(Only VG-4231)
⑤Frequency control range(VG-4231), Absolute pull range(VG-4232) ⑥Supply voltage
⑦Input resistance / OE pin# (Refer to specification table and Pin map)

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)

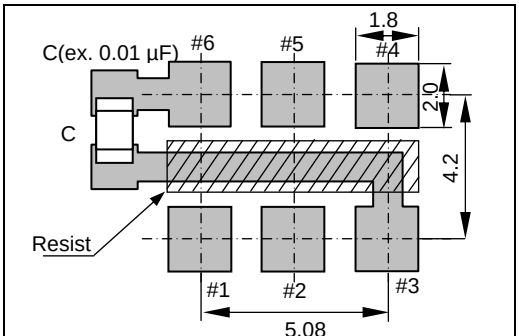


OE pin = "H" or "open": Specified frequency output.
OE pin = "L" : Output is high impedance.

Pin map

Pin	Connection	
	F, M Type	T, Z Type
1	V_C	
2	N.C.	OE
3	GND	
4	OUT	
5	OE	N.C.
6	V_{CC}	

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 V_{CC} - 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.

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In order provide high quality and reliable products and services than meet customer needs,

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►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).

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