VOLTAGE –CONTROLLED CRYSTAL OSCILLATOR (VCXO)
OUTPUT : CMOS

Pb Free   RoHS Compliant

Product Number
Q3614CE00xxxx00

VG-4231CE

- Frequency range : 3 MHz to 50 MHz *
  * 50MHz is not included in Output frequency range.
- Supply voltage : 3.3 V (PSCM / CSCM)
  : 2.8 V (PSBM / CSBM)
  : 1.8 V (PQEM / CQEM)
- Frequency control range : ±140 × 10⁻⁶ (*SCM / *SBM)
  ±120 × 10⁻⁶ (*QEM)
- Low current consumption : 1.0 mA Typ. (27 MHz , 3.3 V)
- External dimensions : 3.2 × 2.5 × 1.05 mm

Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		PSCM / CSCM	PSBM / CSBM	PQEM / CQEM	
Output frequency range	Fo	3 MHz to 50 MHz *		24 MHz to 30 MHz	Please contact us about available frequencies. 50MHz is not included in Output frequency range.
Supply voltage	V_{CC}	3.3 V ± 0.3 V	2.8 V ± 0.2 V	1.8 V ± 0.2 V	
Storage temperature	T_stg	-40 °C to +125 °C			Storage as single product.
Operating temperature	T_use	As per below table			
Frequency tolerance	f_tol	As per below table			C : Vc=1.65 V / B : Vc=1.40 V / E : Vc=0.90 V
Current consumption	Icc	7 mA Max.	6.8 mA Max.	1.2 mA Max.	No load condition
Frequency control range	f_cont	S:± 140 × 10⁻⁶ Min.		Q:± 120 × 10⁻⁶ Min.	Vc = 1/2 Vcc ± 1/2 Vcc
Modulation characteristics	BW	15 kHz Min.			± 3 dB (at 1 kHz)
Input resistance	Rin	M : 5 MΩ Min.			DC level
Frequency change polarity	—	Positive polarity			Vc=0 V to Vcc
Symmetry	SYM	40 % to 60 %			CMOS load:50 % Vcc level
Output voltage	V_{OH}	Vcc-0.4 V Min.			IOH=-3.0 mA
	V_{OL}	0.4 V Max.			IOL= 3.0 mA
Output load condition (CMOS)	L_CMOS	15 pF Max.			CMOS load
Rise time and Fall time	tr / tf	4 ns Max.		6 ns Max.	CMOS load: 20 % Vcc to 80 % Vcc level
Start-up time	t_str	5 ms Max.			Time at 90 % Vcc to be 0 s
Frequency aging	f_age	± 5 × 10⁻⁶ Max.			+25 °C, 5 years

Please keep Vc pin open or ground while powering up Vcc.
50MHz is not included in Output frequency range.

Product Name
(Standard form)   VG-4231 CE 27.000000MHz C S C - M   (⑤⑥:SE,QC,QB are not available)
                  ①   ②   ③   ④⑤⑥ ⑦
①Model   ②Package type   ③Frequency   ④Frequency tolerance / Operating temperature
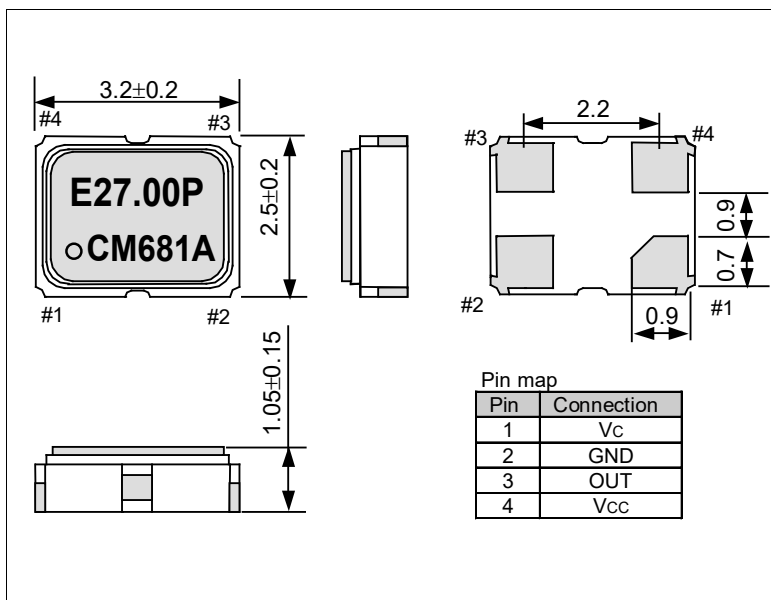⑤Frequency control range   ⑥Supply voltage   ⑦Input resistance (M: 5 MΩ Min.)

④⑤	④Frequency tolerance / Operating temperature		⑤Frequency control range (Absolute pull range*)	
CS	C	±30 × 10⁻⁶ / −20 to +70 °C	S	±140 × 10⁻⁶ Min. (±100 × 10⁻⁶ Min.)
PS	P	±37 × 10⁻⁶ / −40 to +85 °C	S	±140 × 10⁻⁶ Min. (±95 × 10⁻⁶ Min.)
CQ	C	±30 × 10⁻⁶ / −20 to +70 °C	Q	±120 × 10⁻⁶ Min. (±80 × 10⁻⁶ Min.)
PQ	P	±37 × 10⁻⁶ / −40 to +85 °C	Q	±120 × 10⁻⁶ Min. (±75 × 10⁻⁶ Min.)

⑥Supply voltage	
E	1.8 V Typ.
B	2.8 V Typ.
C	3.3 V Typ.

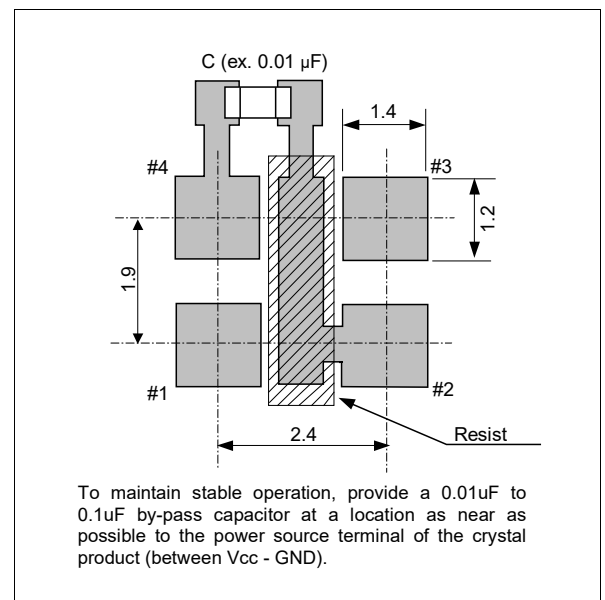* Absolute pull range = Frequency control range- (Frequency tolerance + 5 years Aging + Free fall + Vibration)

External dimensions   (Unit:mm)

E27.00P
CM681A

3.2±0.2
2.5±0.2
1.05±0.15
2.2
0.9
0.7
0.9

#1 #2 #3 #4

Pin map

Pin	Connection
1	Vc
2	GND
3	OUT
4	Vcc

Footprint (Recommended)   (Unit:mm)

C (ex. 0.01 µF)
1.4
1.2
1.9
2.4
Resist
#1 #2 #3 #4

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).