



## VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR (VCXO)

OUTPUT: CMOS

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 :  $\pm 140 \times 10^{-6}$  (\*SCM / \*SBM)
  - $\pm 120 \times 10^{-6}$  (\*QEM)
- Low current consumption : 1.0 mA Typ. (27 MHz, 3.3 V)
- External dimensions : 3.2 x 2.5 x 1.05 mm



## Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		PSCM / CSCM	PSBM / CSBM	PQEM / CQEM	
Output frequency range	F <sub>o</sub>	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 <sub>cc</sub>	3.3 V $\pm 0.3$ V	2.8 V $\pm 0.2$ V	1.8 V $\pm 0.2$ V	
Storage temperature	T <sub>stg</sub>	-40 °C to +125 °C			Storage as single product.
Operating temperature	T <sub>use</sub>	As per below table			
Frequency tolerance	f <sub>tol</sub>	As per below table			C : V <sub>c</sub> =1.65 V / B : V <sub>c</sub> =1.40 V / E : V <sub>c</sub> =0.90 V
Current consumption	I <sub>cc</sub>	7 mA Max.	6.8 mA Max.	1.2 mA Max.	No load condition
Frequency control range	f <sub>cont</sub>	S: $\pm 140 \times 10^{-6}$ Min. Q: $\pm 120 \times 10^{-6}$ Min.			V <sub>c</sub> = 1/2 V <sub>cc</sub> $\pm 1/2$ V <sub>cc</sub>
Modulation characteristics	BW	15 kHz Min.			$\pm 3$ dB (at 1 kHz)
Input resistance	R <sub>in</sub>	M : 5 MΩ Min.			DC level
Frequency change polarity	—	Positive polarity			V <sub>c</sub> =0 V to V <sub>cc</sub>
Symmetry	SYM	40 % to 60 %			CMOS load: 50 % V <sub>cc</sub> level
Output voltage	V <sub>oh</sub>	V <sub>cc</sub> -0.4 V Min.			I <sub>oh</sub> =-3.0 mA
	V <sub>ol</sub>	0.4 V Max.			I <sub>ol</sub> = 3.0 mA
Output load condition (CMOS)	L <sub>CMOS</sub>	15 pF Max.			CMOS load
Rise time and Fall time	t <sub>tr</sub> / t <sub>tf</sub>	4 ns Max.		6 ns Max.	CMOS load: 20 % V <sub>cc</sub> to 80 % V <sub>cc</sub> level
Start-up time	t <sub>str</sub>	5 ms Max.			Time at 90 % V <sub>cc</sub> to be 0 s
Frequency aging	f <sub>age</sub>	$\pm 5 \times 10^{-6}$ Max.			+25 °C, 5 years

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

50MHz is not included in Output frequency range.

Product Name VG-4231 CE 27.00000MHz C S C - M (⑤⑥:SE, QC, QB are not available)

(Standard form) ① ② ③ ④⑤⑥ ⑦

①Model ②Package type ③Frequency ④Frequency tolerance / Operating temperature

⑤Frequency control range ⑥Supply voltage ⑦Input resistance (M: 5 MΩ Min.)

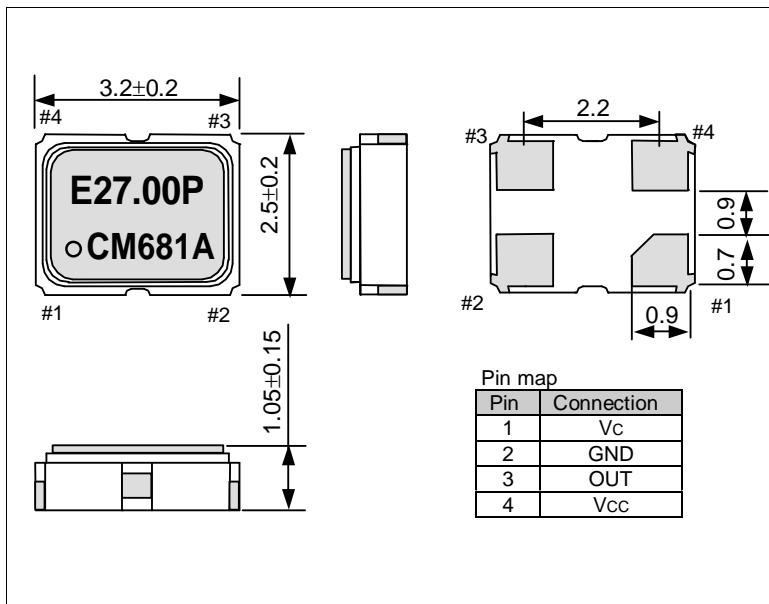
④⑤	④Frequency tolerance / Operating temperature	⑤Frequency control range (Absolute pull range*)
CS	C $\pm 30 \times 10^{-6}$ / -20 to +70 °C	S $\pm 140 \times 10^{-6}$ Min. ( $\pm 100 \times 10^{-6}$ Min.)
PS	P $\pm 37 \times 10^{-6}$ / -40 to +85 °C	S $\pm 140 \times 10^{-6}$ Min. ( $\pm 95 \times 10^{-6}$ Min.)
CQ	C $\pm 30 \times 10^{-6}$ / -20 to +70 °C	Q $\pm 120 \times 10^{-6}$ Min. ( $\pm 80 \times 10^{-6}$ Min.)
PQ	P $\pm 37 \times 10^{-6}$ / -40 to +85 °C	Q $\pm 120 \times 10^{-6}$ Min. ( $\pm 75 \times 10^{-6}$ 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)

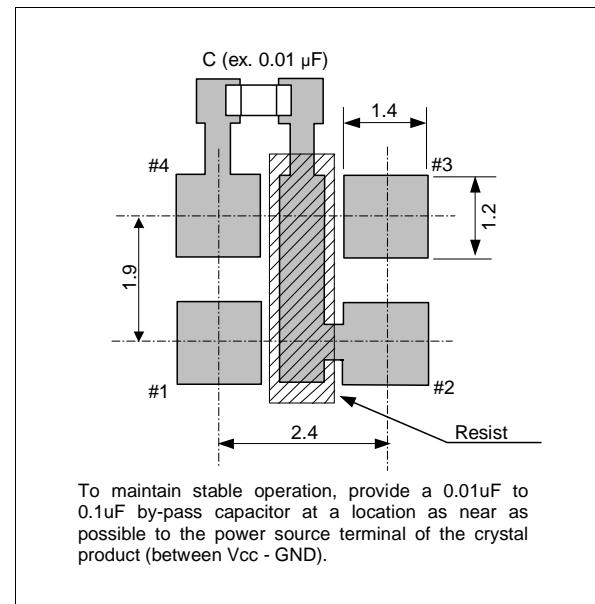
## External dimensions

(Unit:mm)



## Footprint (Recommended)

(Unit:mm)



► **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 general equipment.
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