

## VCXO

## VG-4231CE

SEIKO EPSON CORPORATION

Product name VG-4231CE 16.384000 MHz CSC-M

Product code / Ordering code Q3614CE000024xx

Please refer to the 8.Packing information about xx (last 2 digits)

Output waveform CMOS

Pb free / Complies with EU RoHS directive

Reference weight Typ.26 mg

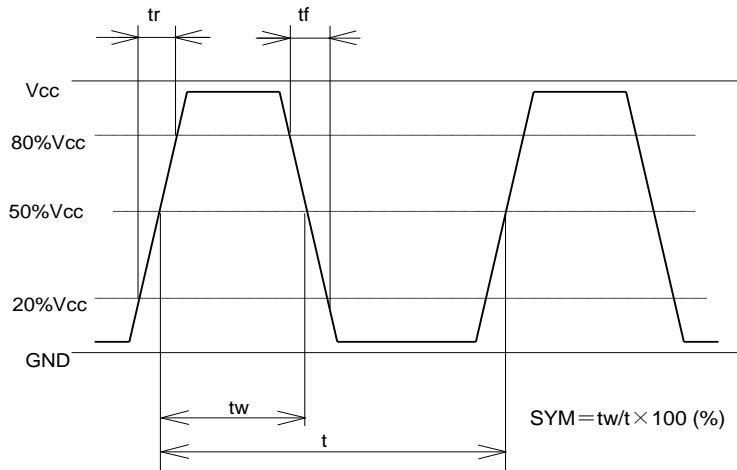
**1.Absolute maximum ratings**

| Parameter              | Symbol              | Min. | Typ. | Max.                 | Unit | Conditions / Remarks                       |
|------------------------|---------------------|------|------|----------------------|------|--|
| Maximum supply voltage | V <sub>cc-GND</sub> | -0.3 | -    | +7                   | V    | -  |
| Storage temperature    | T <sub>stg</sub>    | -40  | -    | +125                 | °C   | Storage as single product after unpacking. |
| Input voltage          | V <sub>in</sub>     | -0.3 | -    | V <sub>cc</sub> +0.3 | V    | V <sub>c</sub> traminl                     |

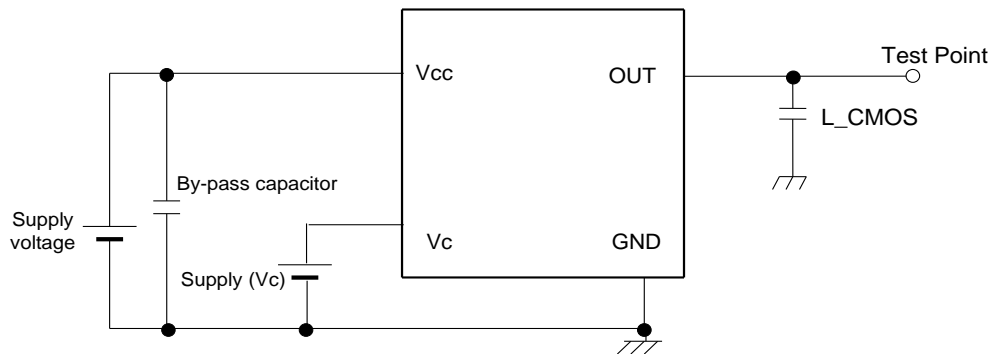
**2.Specifications(characteristics)**

| Parameter                  | Symbol             | Min.                 | Typ.    | Max.                 | Unit              | Conditions / Remarks                           |
|----------------------------|--------------------|----------------------|---------|----------------------|-------------------|--|
| Output frequency           | f <sub>o</sub>     |                      | 16.3840 |                      | MHz               |  |
| Supply voltage             | V <sub>cc</sub>    | 3                    | 3.3     | 3.6                  | V                 | -  |
| Control voltage            | V <sub>c</sub>     | 0                    | 1.65    | 3.3                  | V                 | V <sub>c</sub> =1.65V+/-1.65V                  |
| Operating temperature      | T <sub>use</sub>   | -20                  | -       | +70                  | °C                | -  |
| Frequency tolerance        | f <sub>tol</sub>   | -30                  | 0       | +30                  | x10 <sup>-6</sup> | T <sub>use</sub>                               |
| Current consumption        | I <sub>cc</sub>    | -                    | -       | 2.5                  | mA                | No load  |
| Frequency control range    | f <sub>cont</sub>  | +/-140               | -       | -                    | x10 <sup>-6</sup> | -  |
| Absolute pull range        | APR                | +/-100               | -       | -                    | x10 <sup>-6</sup> | -  |
| Modulation characteristics | BW                 | 15                   | -       | -                    | kHz               | +/-3dB   |
| Input resistance           | R <sub>in</sub>    | 5                    | -       | -                    | MΩ                | -  |
| Linearity                  | F <sub>LIN</sub>   | -                    | -       | +/-10                | %                 | -  |
| Frequency change polarity  | -                  | Positive             |         |                      | -                 | -  |
| Symmetry                   | SYM                | 40                   | -       | 60                   | %                 | 50% V <sub>cc</sub> level                      |
| Output voltage             | V <sub>OH</sub>    | 90 % V <sub>cc</sub> | -       | -                    | V                 | I <sub>OH</sub> = -3.0 mA                      |
|                            | V <sub>OL</sub>    | -                    | -       | 10 % V <sub>cc</sub> | V                 | I <sub>OL</sub> = 3.0 mA                       |
| Output load condition      | L <sub>CMOS</sub>  | -                    | -       | 15                   | pF                | -  |
| Rise time                  | t <sub>r</sub>     | -                    | -       | 4                    | ns                | 20%V <sub>cc</sub> to 80%V <sub>cc</sub> level |
| Fall time                  | t <sub>f</sub>     | -                    | -       | 4                    | ns                | 80%V <sub>cc</sub> to 20%V <sub>cc</sub> level |
| Start-up time              | t <sub>str</sub>   | -                    | -       | 5                    | ms                | t=0 at 90 %V <sub>cc</sub>                     |
| Frequency aging            | f <sub>aging</sub> | -5                   | -       | 5                    | x10 <sup>-6</sup> | 25°C, 5years                                   |

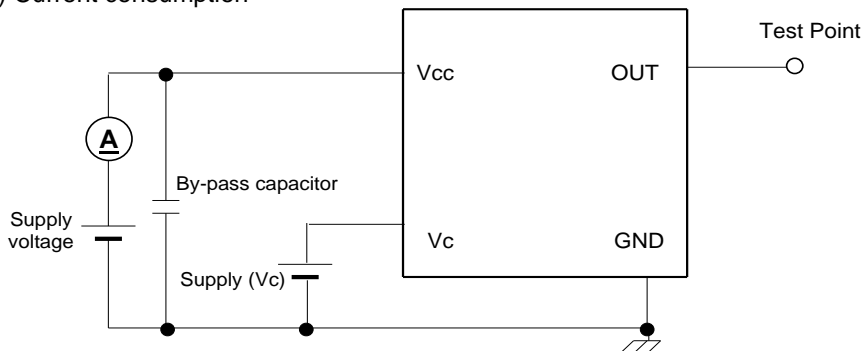
## 3. Timing chart



## 4. Test circuit

1) C-MOS load  $CL=15\text{ pF}$ 

## 2) Current consumption



## 3) Condition

## 1. Oscilloscope

Impossible to measure both frequency and wave form at the same time.

(In case of using oscilloscope's amplifier output, possible to measure both at the same time.)

## 2. L\_CMOS includes probe capacitance.

3. By-pass capacitor (0.01  $\mu\text{F}$  to 0.1  $\mu\text{F}$ ) is placed closely between Vcc and GND.

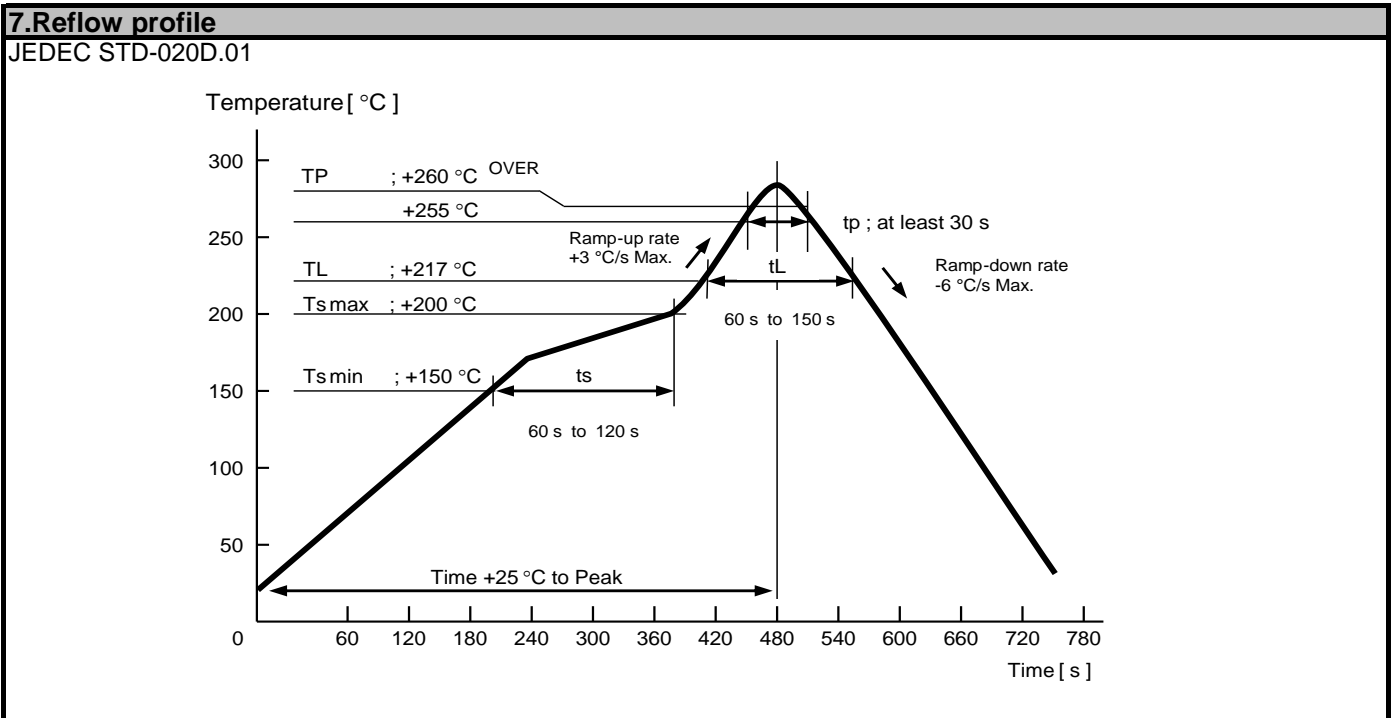
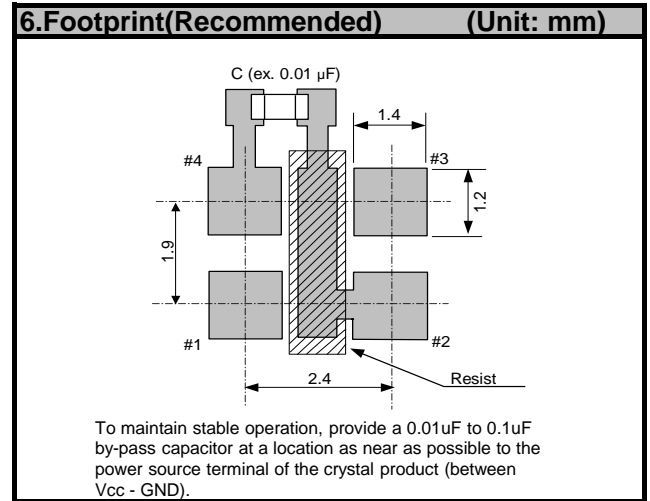
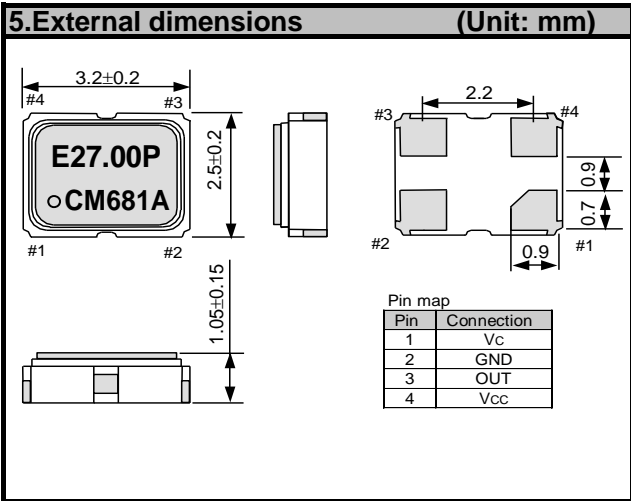
4. Use the current meter whose internal impedance value is small.

## 5. Power Supply

· Start up time (0 %Vcc  $\rightarrow$  90 %Vcc) of power source should be more than 150  $\mu\text{s}$ .

· Impedance of power supply should be as low as possible.

6. One point earth of test circuit is required.



**8.Packing information**

[ 1 ] Product number last 2 digits code(xx) description      The recommended code is "00"

Q3614CE000024xx

| Code | Condition                    | Code | Condition     |
|------|------------------------------|------|---------------|
| 00   | 1000pcs / Reel               | 12   | 250pcs / Reel |
| 01   | Any Q'ty vinyl bag(Tape cut) | 13   | 500pcs / Reel |
| 11   | Any Q'ty / Reel              | 14   | 1kpcs / Reel  |

[ 2 ] Taping specification

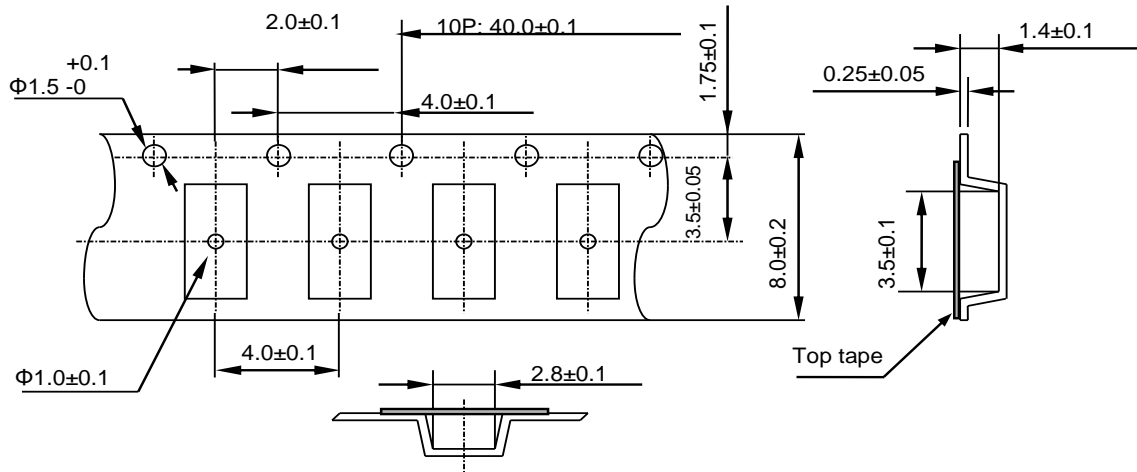
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

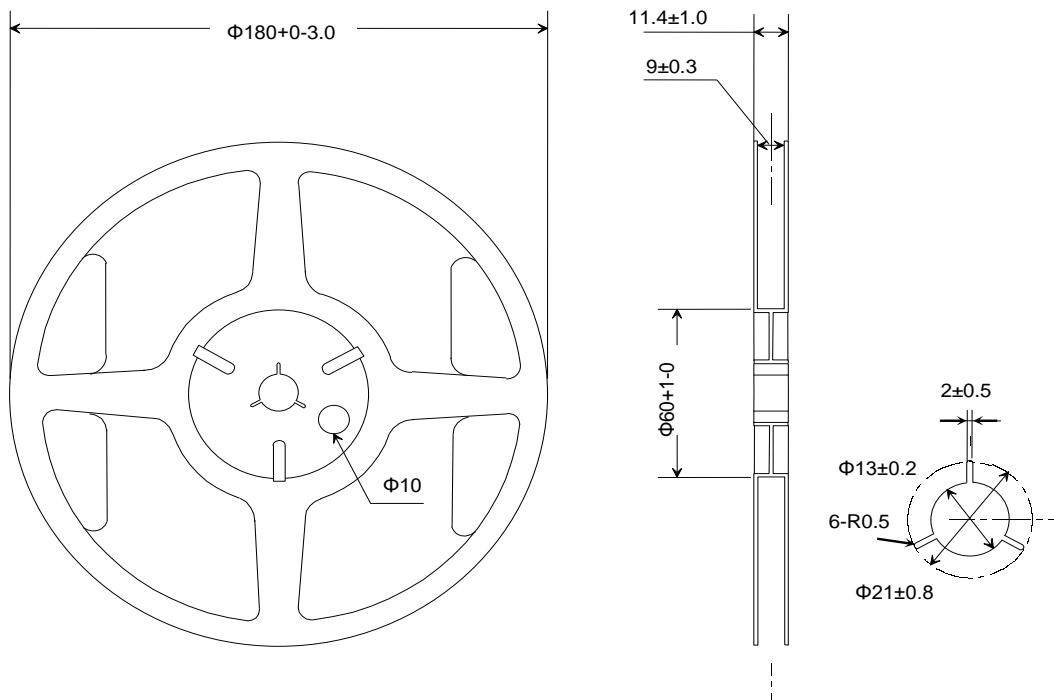
Unit: mm



(2) Reel dimensions

Material of the Reel : PS

Unit: mm



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