

## Temperature Compensated Crystal Oscillator (TCXO )

# TG-5006CE-19H 26MHz

- Reflowable and high density mounting type ultra small size SMD (3.2×2.5×0.9 mm Typ.).
- Using the heat-resisting type AT cut quartz crystal  
allows almost the same temperature soldering as universal SMD IC.
- Operating supply voltage : 1.8V or 2.8 V or 3.3V.

### ■ Specifications

#### 1. Absolute maximum ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	V <sub>CC-GND</sub>	-0.3 to 4.5	V	
Storage temperature range	T <sub>-STG</sub>	-40 to +90	°C	

#### 2. Operating range

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power voltage	V <sub>cc 1</sub>	1.7	1.8	1.9	V	V <sub>cc</sub> =1.8V +/- 0.1V
	V <sub>cc 2</sub>	2.66	2.8	2.94	V	V <sub>cc</sub> =2.8V +/- 5%
	V <sub>cc 3</sub>	3.135	3.3	3.465	V	V <sub>cc</sub> =3.3V +/- 5%
	GND	0.0		0.0	V	
Operating temperature range	T <sub>use1</sub>	-30	+25	+85	°C	
	T <sub>use2</sub>	-40	+25	+85	°C	
Output load	Load <sub>R</sub>	9	10	11	kΩ	
	Load <sub>C</sub>	9	10	11	pF	
DC-cut capacitor	C <sub>c</sub>	0.01			μF	

DC-cut capacitor is not included in our TCXO. Please insert DC-cut capacitor in output line.

### 3.Frequency characteristics

1) Output frequency 26.000 000 MHz

2) Frequency characteristics

( V<sub>CC</sub>= Vcc1 or Vcc2 or Vcc3, GND=0.0V, Load 10 kΩ//10 pF(DC cut), T<sub>use</sub> = +25°C )

Parameter	Symbol	Value	Unit	Note
Frequency tolerance	f_tol	+/- 2.0×10 <sup>-6</sup> Max.	-	T <sub>use</sub> =+25 °C +/-2 °C Reflow cycles : 2 times.*1 *2
Frequency / temperature coefficient	fo-Tc	+/- 0.5×10 <sup>-6</sup> Max.	-	T <sub>use</sub> =-30°C to +85°C Based on frequency at +25°C
		+/- 2.5×10 <sup>-6</sup> Max.	-	T <sub>use</sub> =-40°C to +85°C Based on frequency at +25°C
Frequency slope vs. Temp.	-	+/- 0.1×10 <sup>-6</sup> Max.	/°C	T <sub>use</sub> =-20°C to +70°C
		+/- 0.2×10 <sup>-6</sup> Max.	/°C	T <sub>use</sub> =-30°C to +85°C
		+/- 0.5×10 <sup>-6</sup> Max.	/°C	T <sub>use</sub> =-40°C to +85°C
Static temperature hysteresis	-	+/- 0.6×10 <sup>-6</sup> Max.	-	Frequency change after reciprocal temperature ramped over the operating temperature range 1. Frequency measured before and - after at 25 °C
G sensitivity	-	+/- 3.0×10 <sup>-9</sup> Max.	/G	All 3 axes,random vibration, 30Hz to 500Hz
Frequency / Load coefficient	fo-Load	+/- 0.1×10 <sup>-6</sup> Max.	-	Load :10kΩ//10 pF +/-10 % each
Frequency / voltage coefficient	fo-Vcc	+/- 0.2×10 <sup>-6</sup> Max.	-	Vcc: Vcc1 or Vcc2 or Vcc3
Frequency aging	f_aging	+/- 1.0×10 <sup>-6</sup> Max.	-	T <sub>use</sub> =+25°C First year
		+/- 2.0×10 <sup>-6</sup> Max.		T <sub>use</sub> =+25°C 2 years
		+/- 4.0×10 <sup>-6</sup> Max.		T <sub>use</sub> =+25°C 10 years

\*1 Include initial frequency tolerance and frequency deviation after reflow cycles.

\*2 Measurement of frequency deviation is made 1h after reflow soldering.

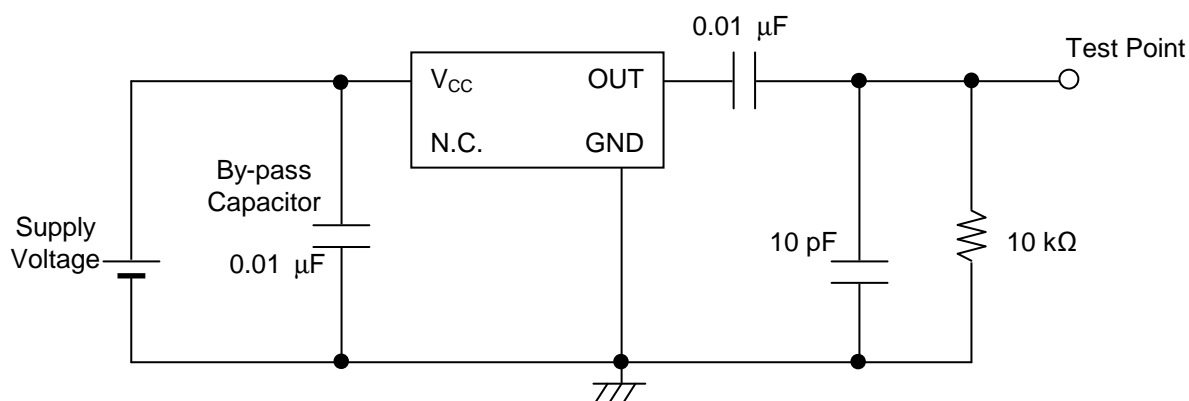
#### 4. Electrical characteristics

(  $V_{CC}=V_{CC1}$  or  $V_{CC2}$  or  $V_{CC3}$ ,  $GND=0.0V$ , Load 10 k $\Omega$ //10 pF(DC cut),  $T_{use} = +25^{\circ}C$  )

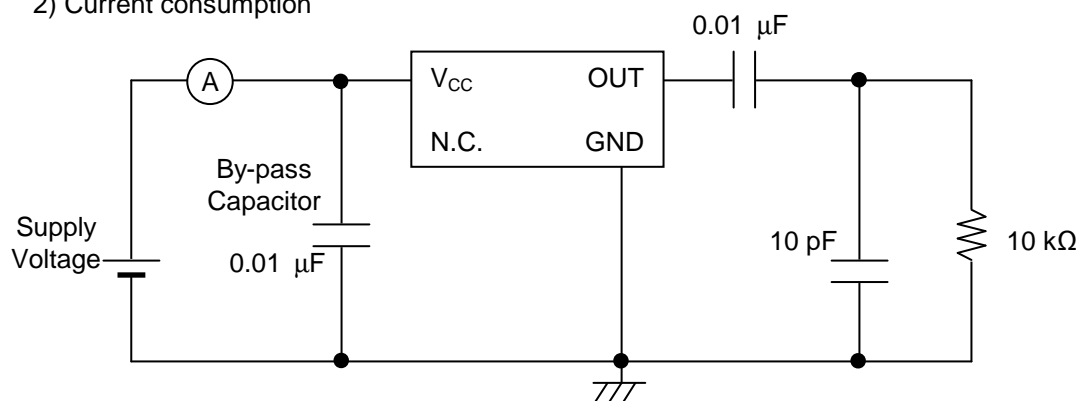
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Current consumption	I <sub>cc</sub>			1.5	mA	
Output level	V <sub>pp</sub>	0.8			V	Peak to peak voltage
SSB Phase noise	L(f)			-83	dBc/Hz	Offset:10 Hz
				-108		Offset:100 Hz
				-135		Offset:1 kHz
				-148		Offset:10 kHz

## 5. Test circuit

1) Output Load : 10 kΩ // 10 pF



2) Current consumption



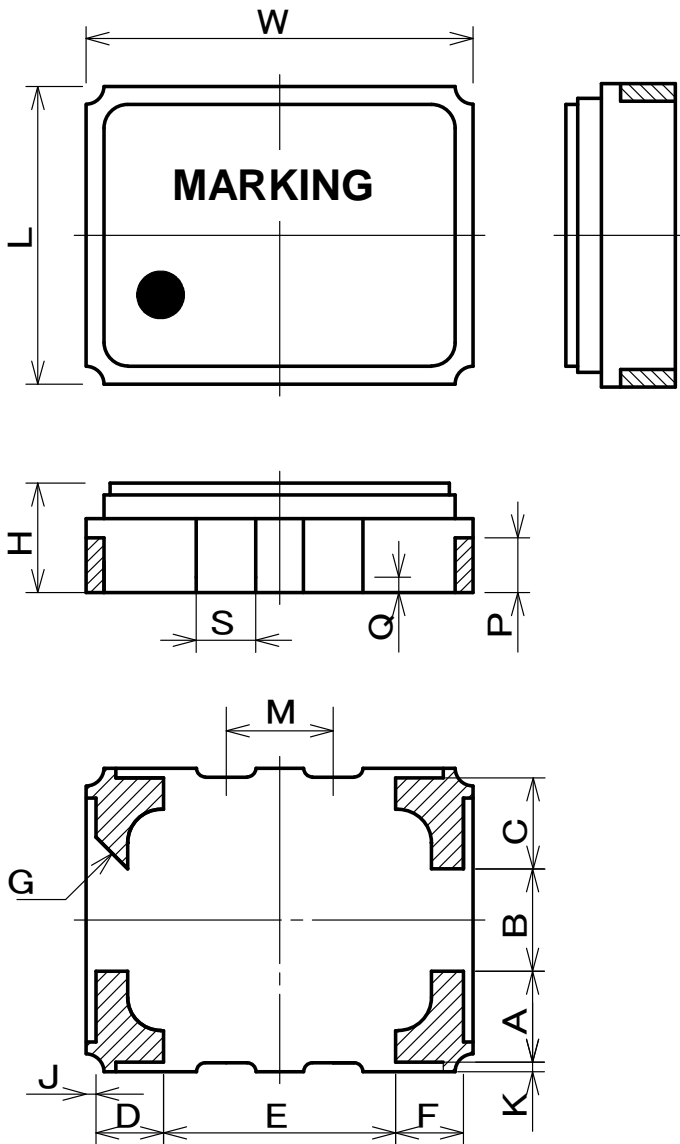
3) Conditions

- |                  |                   |              |
|------------------|-------------------|--------------|
| 1. Oscilloscope: | Impedance         | Min. 1 MΩ    |
|                  | Input capacitance | Max. 10 pF   |
|                  | Band width        | Min. 300 MHz |

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. CL includes probe capacitance.
3. A capacitor (By-pass: 0.01 μF) is placed between V<sub>CC</sub> and GND, and closely to TCXO.
4. Use the current meter whose internal impedance value is small.
5. Power Supply  
Impedance of power supply should be as lowest as possible.
6. GND should apply one point earth.

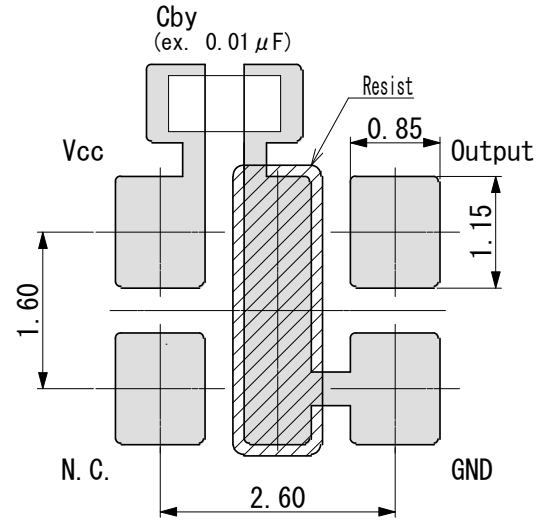
6. Outline Drawing



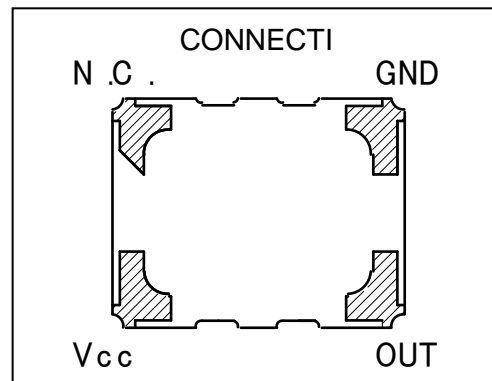
Marking  
TBD

Material  
Ceramics(base)  
Au coated nickel(terminal)  
Fe-Ni-Co(lid)

7. Recommended soldering pattern



Please connect Cby(bypass capacitor) quite near by "Vcc" terminal.  
Do not design any patterns except GND on the shaded area.



BOTTOM VIEW

(unit : mm)

DIM.	MIN.	TYP.	MAX.	DIM.	MIN.	TYP.	MAX.
W	3.00	3.20	3.40	F	—	0.57	—
L	2.30	2.50	2.70	G	—	C 0.27	—
H	0.80	0.90	1.00	J	—	0.08	—
A	—	0.765	—	K	—	0.08	—
B	0.76	0.86	0.96	M	0.80	0.90	1.00
C	—	0.765	—	P	0.41	0.46	0.51
D	—	0.57	—	S	0.40	0.50	0.60
E	1.85	1.95	2.05				