

Preliminary Specifications

Temperature Compensated Crystal Oscillator (TCXO)

TG-5035CG-61N 50MHz

- Reflowable and high density mounting type ultra small size SMD (2.5×2.0×0.8 mm Typ.).
- Using the heat-resisting type AT cut quartz crystal allows almost the same temperature soldering as universal SMD IC.
- Operating supply voltage : 1.8 V, 2.8 V, or 3.0 V

■ Specifications

1. Absolute maximum ratings

| Parameter | Symbol | Value | Unit | Note |
|---------------------------|---------------------|-------------|------|------|
| Supply voltage | V _{CC-GND} | -0.3 to 4.0 | V | |
| Storage temperature range | T _{STG} | -40 to +90 | °C | |

2. Operating range

| Parameter | Symbol | Value | | | Unit | Note |
|-----------------------------|------------------|-------|------|------|------|------|
| | | Min. | Typ. | Max. | | |
| Power voltage | V _{CC} | 1.7 | — | 3.3 | V | |
| | GND | 0.0 | | 0.0 | V | |
| Operating temperature range | T _{use} | -30 | +25 | +85 | °C | |
| Output load | Load1_R | 9 | 10 | 11 | kΩ | |
| | Load1_C | 9 | 10 | 11 | pF | |
| DC-cut capacitor | C _C | 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 50.000 000 MHz

2) Frequency characteristics

(Condition : Vcc = 1.8 V, 2.8 V, or 3.0 V, GND=0.0V, Load 10 kΩ//10 pF(DC cut), T_{use} = +25°C)

| Parameter | Symbol | Value | Unit | Note |
|---|------------------------|------------------------------------|------|--|
| Frequency tolerance | f _{tol} (OSC) | +/- 1.0 × 10 ⁻⁶ Max. | - | T _{use} = +25°C +/-2°C Before reflow soldering |
| | f _{tol} | +/- 2.0 × 10 ⁻⁶ Max. *1 | - | T _{use} = +25°C +/-2°C Reflow cycles : 2 times.*2 |
| Frequency / temperature characteristics | fo-Tc | +/- 0.5 × 10 ⁻⁶ Max. | - | T _{use} = -30°C to +85°C Based on frequency at +25°C |
| Frequency / Load coefficient | fo-Load | +/- 0.2 × 10 ⁻⁶ Max. | - | Load :10kΩ//10pF +/-10% each |
| Frequency / voltage coefficient | fo-Vcc | +/- 0.2 × 10 ⁻⁶ Max. | - | Vcc +/- 5 % *3 |
| Frequency aging | f _{age} | +/- 1.0 × 10 ⁻⁶ Max. | - | First year T _{use} = +25°C |

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

*2 Measurement of frequency deviation is made 24h after reflow soldering.

*3 Vcc +/- 5% must be in operating supply voltage range (1.7 V to 3.3 V)

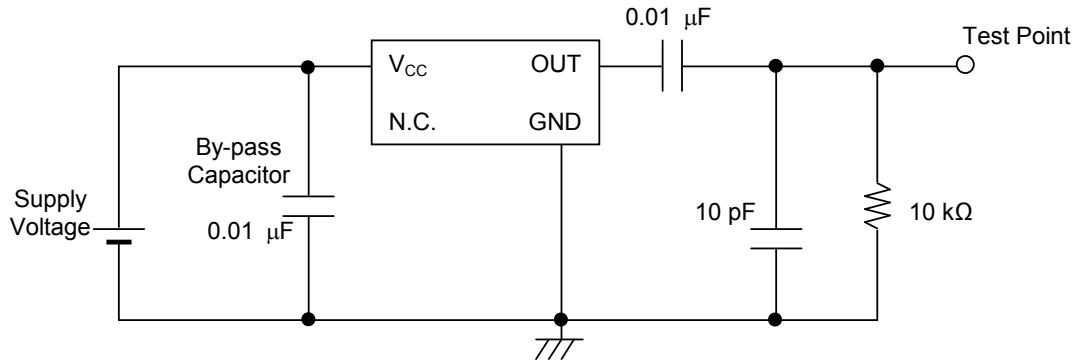
4. Electrical characteristics

(Condition : Vcc = 1.8 V, 2.8 V, or 3.0 V, GND=0.0V, Load 10 kΩ//10 pF(DC cut), T_{use} = +25°C)

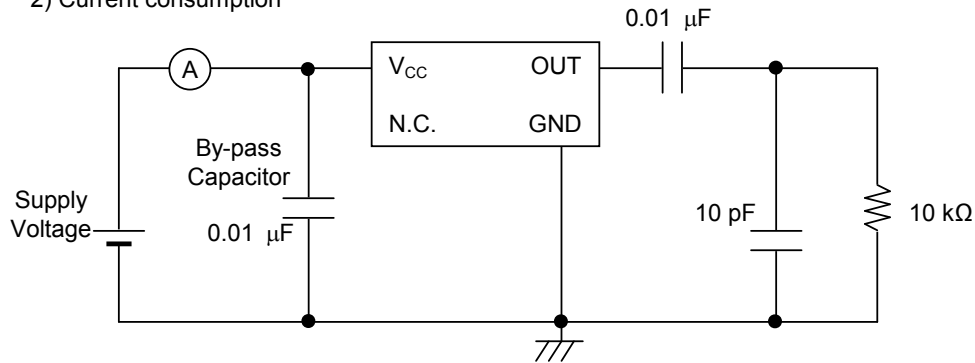
| Parameter | Symbol | Value | | | Unit | Note |
|---------------------|------------------|-------|------|------|------------|--|
| | | Min. | Typ. | Max. | | |
| Current consumption | I _{cc} | | | 2.5 | mA | |
| Output level | V _{pp} | 0.8 | | 1.5 | V | Peak to peak voltage Clipped sine wave |
| Symmetry | SYM | 40 | | 60 | % | GND Level |
| Harmonics | - | | | -8 | dBc | |
| Start up time | t _{osc} | | | 2.0 | ms | Until output signal has been reached min 90% of final amp. |
| | | | | 2.0 | | Until frequency has been reached within +/-1 ppm of final freq. |
| SSB Phase noise | L(f) | | -86 | -80 | dBc /Hz | Offset:10 Hz |
| | | | -111 | -105 | | Offset:100 Hz |
| | | | -131 | -125 | | Offset:1 kHz |
| | | | -147 | -143 | | Offset:10 kHz |
| | | | -151 | -148 | | Offset:100 kHz |
| | | | -152 | -148 | | Offset:1 MHz |

5. Test circuit

1) Output Load : 10 k Ω // 10 pF



2) Current consumption



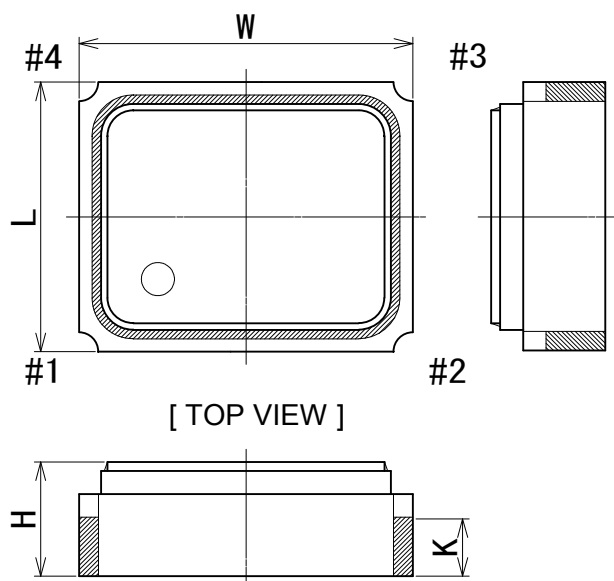
3) Conditions

- | | | |
|------------------|-------------------|-------------------|
| 1. Oscilloscope: | Impedance | Min. 1 M Ω |
| | 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.)

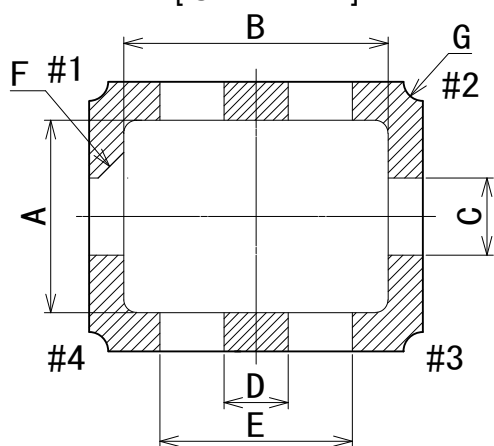
2. CL includes probe capacitance.
3. A capacitor (By-pass: 0.01 μ F) is placed between V_{CC} and GND, and closely to TCXO.
4. Use the current meter whose internal impedance value is small.
5. Power Supply
Impedance of power supply should be as lowest as possible.
6. GND should apply one point earth.

6. Outline Drawing



[TOP VIEW]

[SIDE VIEW]



[BOTTOM VIEW]

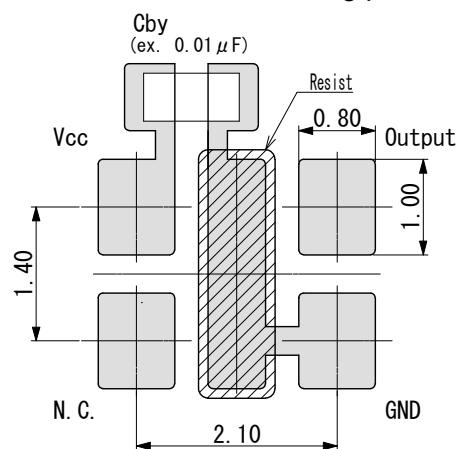
Marking
TBD

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

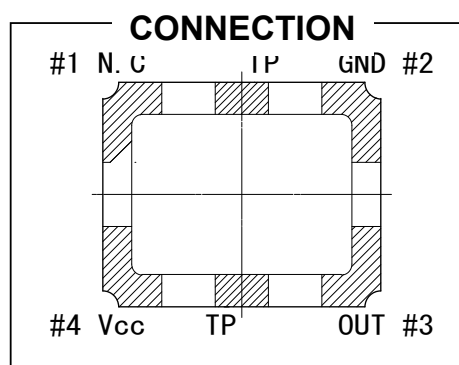
(unit : mm)

| DIM. | MIN. | TYP. | MAX. | DIM. | MIN. | TYP. | MAX. |
|------|------|------|------|------|------|-------|------|
| W | 2.30 | 2.50 | 2.70 | D | 0.40 | 0.50 | 0.60 |
| L | 1.80 | 2.00 | 2.20 | E | 1.35 | 1.50 | 1.65 |
| H | 0.70 | 0.80 | 0.90 | F | --- | R0.15 | --- |
| A | 1.35 | 1.50 | 1.65 | G | --- | 0.45 | --- |
| B | 1.95 | 2.10 | 2.25 | | | | |
| C | 0.50 | 0.60 | 0.70 | | | | |

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]