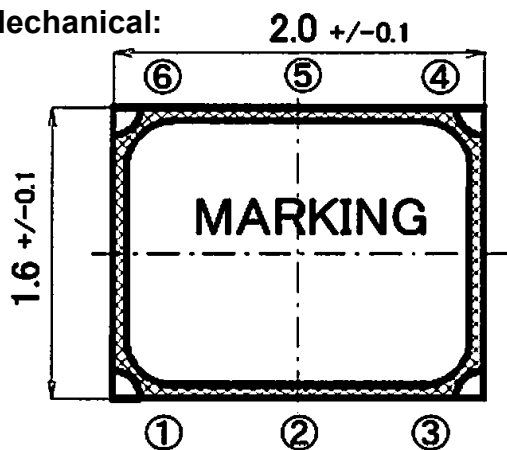


- Pletronics TCG4 Series is an precision temperature compensated crystal oscillator.
- The TCG4 has a clipped-sine output.
- Frequencies available from 15MHz to 52 MHz
- Supply voltages from 1.8V to 3.3V

- 1.6 X 2.0 mm Ceramic LCC Package
- Very Low Power consumption
- Optional Voltage Control function
- Low phase noise and jitter

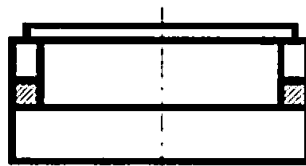
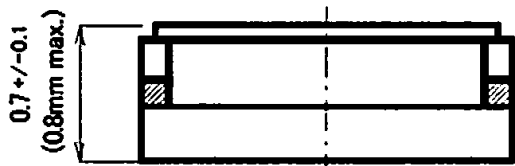
Mechanical:



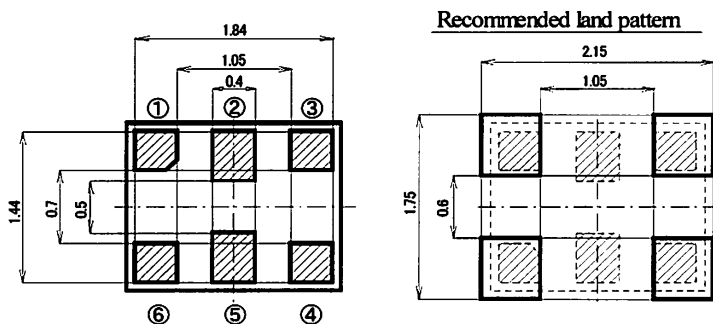
Pin Connections

- ①: VC
- ②: NC
- ③: GND
- ④: OUTPUT
- ⑤: NC
- ⑥: Vcc

NC= no external connection allowed



Contacts: gold 11.8 to 39.4 μ-inches (0.3 to 1.0 μm) over Nickel 50 to 350 μ-inches (1.27 to 8.89 μm).



Layout and Application Information

For optimum jitter performance, Pletronics recommends:

- A ground plane under the device
- No large transient signals (both voltage and current) should be routed under the device.
- Do not layout near large magnetic fields such as high frequency switching power supplies.
- Do not place near piezoelectric buzzers or mechanical fans.

Electrical Specification for specified Vcc over the specified temperature range

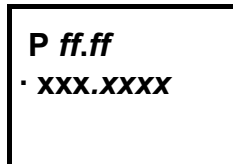
| Item | Min | TYP | Max | Unit | Condition |
|--|------------------|------|------------|------------------|---|
| Frequency Range | 15 | | 52 | MHz | See table of available frequencies. |
| Frequency Tolerance (Calibration) | -1.0 | | +1.0 | ppm | Vcontrol =(1.50 or 0.9) volts at 25±2°C, reference to nominal frequency Vcontrol = 0.9 volts for VCC below 2.5 Volts |
| Frequency Stability vs. Temp. ¹ | -0.5 | | +0.5 | ppm | Over operating range referenced to value at 25±2°C |
| Frequency Stability vs. Supply | -0.2 | | +0.2 | ppm | Load: 10K ohm // 10 pF & Vcc ±5% |
| Frequency Stability vs. Load | -0.2 | | +0.2 | ppm | Load 10K ohm 10 pF ±5% |
| Aging | -1.0 | | +1.0 | ppm | Per year at 25°C |
| Output Waveform | Clipped Sinewave | | | | DC Coupled |
| Output Level | 0.8 | | | V _{p-p} | Load: 10K ohm ±10% // 10 pF ±10% |
| Phase Noise | 10 Hz | - | -85 | - | dBc/Hz |
| | 100Hz | - | -110 | - | |
| | 1 KHz | - | -130 | - | |
| | 10 KHz | - | -145 | - | |
| | 100KHz | - | -145 | - | |
| V Supply Range V _{CC} | 1.7 | - | 3.3 | Volts | Specified by part number. |
| Supply Current I _{CC} | | 2.5 | | mA | |
| Vcontrol Range | 0.5 0.3 | | 2.5 1.5 | Volts | 1.50 volts nominal for V _{CC} ≥ 2.5V 0.90 volts nominal for V _{CC} ≤ 2.5V |
| Frequency Pullability ¹ | | ±8 | | ppm | |
| Linearity | - | 0.05 | 2.0 | % | In accordance with MIL-PRF-55310 |
| Operating Temperature Range ¹ | -30 | | +85 | °C | |
| Storage Temperature Range | -40 | | +85 | °C | |

¹ Specified by Part Number

Part Number:

| | | | | | | | | | |
|-------------|------------|------------|----------|----------|------------|------------|---------------|------------|--|
| TCG4 | 017 | 019 | G | H | 010 | 008 | -20.0M | -XX | |
| | | | | | | | | | Internal code or blank |
| | | | | | | | | | Nominal Frequency in MHz |
| | | | | | | | | | Pullability in ppm (Vcontrol)(in ppm) 000 = TCXO only 005 = ±5 ppm minimum 008 = ±8 ppm minimum |
| | | | | | | | | | Stability in ppm 010 = ± 1.0 ppm, 005 = ±0.5 ppm |
| | | | | | | | | | Highest Specified Operating Temperature A = +40°C E = +60°C J = +80°C B = +45°C F = +65°C K = +85°C C = +50°C G = +70°C D = +55°C H = +75°C |
| | | | | | | | | | Lowest Specified Operating Temperature A = +10°C E = -10°C J = -30°C B = +5°C F = -15°C C = +0°C G = -20°C D = -5°C H = -25°C |
| | | | | | | | | | Highest Supply Voltage ¹ (voltage * 10) 035 = 3.3 volts 030 = 3.0 volts (typical examples shown) |
| | | | | | | | | | Lowest Supply Voltage ¹ (voltage * 10) 017 = 1.7 volts 028 = 2.8 volts (typical examples shown) |
| | | | | | | | | | Series (Part Type, Logic & Package) |

Part Marking:



P = Pletronics
ff.ff = frequency in MHz
xxx.xxxx = internal code

Package Labeling:

Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial



Pletronics Inc. certifies this device is in accordance with the RoHS 6/6 (2002/95/EC) and WEEE (2002/96/EC) directives.

- Pletronics Inc. guarantees the device does not contain the following:
Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
- Weight of the Device: 0.64 grams
- Moisture Sensitivity Level: 1 As defined in J-STD-020D.
- Second Level Interconnect code: e4

Absolute Maximum Ratings:

| Parameter | Unit |
|--------------------------------|---------------------------------|
| V _{CC} Supply Voltage | -0.5V to +6.0V |
| V _i Input Voltage | -0.5V to V _{CC} + 0.5V |
| V _o Output Voltage | -0.5V to V _{CC} + 0.5V |

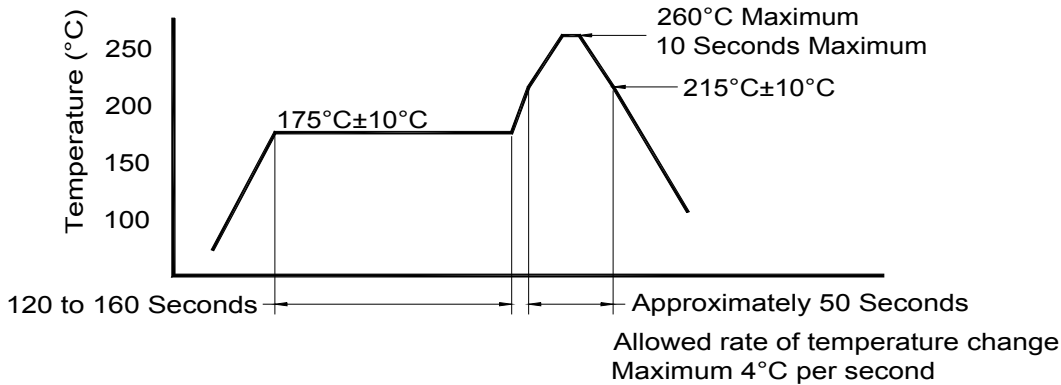
ESD Rating

| Model | Minimum Voltage | Conditions |
|----------------------|-----------------|-------------------------|
| Human Body Model | 1500 | MIL-STD-883 Method 3115 |
| Charged Device Model | 1000 | JESD 22-C101 |

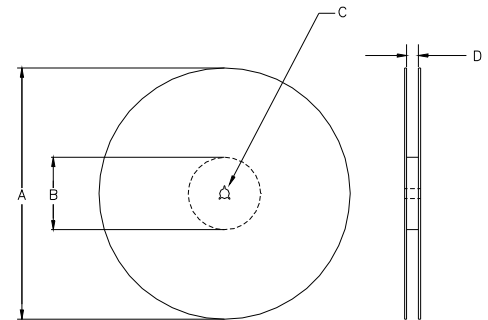
Reliability: Environmental Compliance

| Parameter | Condition |
|------------------|--------------------------------------|
| Mechanical Shock | MIL-STD-883 Method 2002, Condition B |
| Vibration | MIL-STD-883 Method 2007, Condition A |
| Solderability | MIL-STD-883 Method 2003 |
| Thermal Shock | MIL-STD-883 Method 1011, Condition A |

Reflow Cycle (typical for lead free processing)



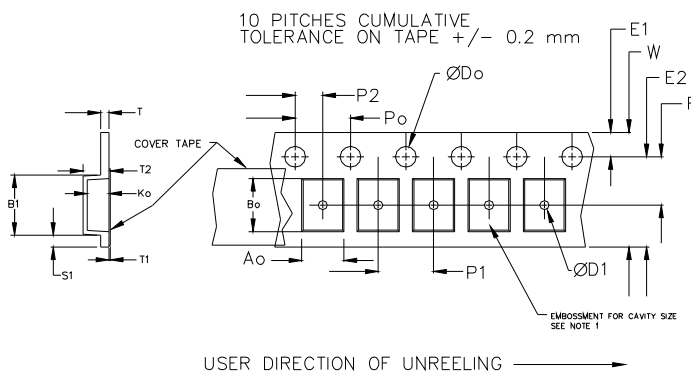
| Constant Dimensions Table 1 | | | | | | | | |
|-----------------------------|--------------|--------|--------------|-------------|-------|--------|-------|--------|
| Tape Size | D0 | D1 Min | E1 | P0 | P2 | S1 Min | T Max | T1 Max |
| 8mm | -0.0 +1.0 | 1.0 | 1.75 ±0.1 | 4.0 ±0.1 | 2.0 | - | 0.6 | - |
| 12mm | | 1.5 | | | ±0.05 | | | |
| 16mm | | 1.5 | | | ±0.1 | | | |
| 24mm | | 1.5 | | | ±0.1 | | | |



| Variable Dimensions Table 2 | | | | | | |
|-----------------------------|--------|-----------|-----------|--------|-------|-------------|
| Tape Size | B1 Max | F | P1 | T2 Max | W Max | Ao, Bo & Ko |
| 8mm | 2.2 | 3.5 ± 0.1 | 4.0 ± 0.1 | 1.2 | 8.0 | Note 1 |

| Reel Dimensions | | | | | |
|-----------------|--------|------------------|-------|-------|------------|
| A | Inches | 7.0 | 10.0 | 13.0 | Tape Width |
| | mm | 177.8 | 254.0 | 330.2 | |
| B | Inches | 2.50 | 4.00 | 3.75 | Tape Width |
| | mm | 63.5 | 101.6 | 95.3 | |
| C | mm | 13.0 +0.5 / -0.2 | | | Tape Width |
| D | mm | 16.4 +2.0 -0.0 | | | |

Note 1: Embossed Cavity to conform to EIA-481-B. Dimensions in mm Not to Scale



Reel Dimensions may vary from the above.

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