

OeD4213-19.20M TCVCXO Oscillator

November 2010

- Pletronics' OeD4 is from the OeXO™ Series of temperature compensated voltage controlled crystal oscillator with a CMOS output.
- Cut Tape -or- Tape and Reel packaging
- 3.2 x 5 mm LCC Ceramic Package
- Supply Voltage: 3.3V

**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: 0.10 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D.1
Second Level Interconnect code: e4



Absolute Maximum Ratings:

| Parameter | Unit |
|--------------------------------|---------------------------------|
| V _{CC} Supply Voltage | -0.5V to +6.5V |
| V _i Input Voltage | -0.5V to V _{CC} + 0.5V |
| V _o Output Voltage | -0.5V to V _{CC} + 0.5V |

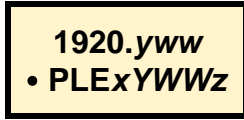
Thermal Characteristics

The maximum die or junction temperature is 155°C
The thermal resistance junction to board is 30 to 50°C/Watt depending on the solder pads, ground plane and construction of the PCB.

ESD Rating

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

Part Marking:



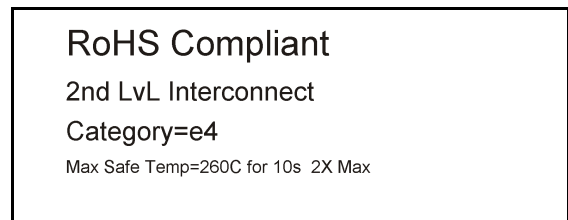
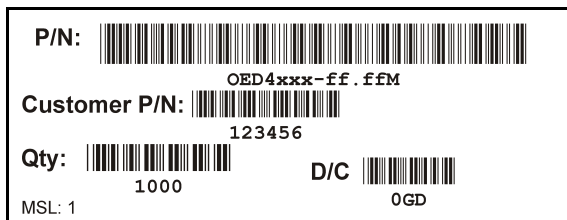
| | | |
|------|---|--|
| 1920 | = | 19.20MHz, the crystal frequency |
| yww | = | Year and Week of the crystal manufacture |
| PLE | = | Pletronics |
| X | = | Model number, normally a "B" |
| YWW | = | Year and Week of assembly of the TCXO |
| Z | = | internal factory code |

The actual part number is OED4213-19.20M where the model number "213" is the specification number the part is made to. This is not included in the part marking. This is included on the label on the Tape and Reel.

Package Labeling

Label is 1" x 2.6" (25.4mm x 66.7mm)
 Font is Courier New
 Bar code is 39-Full ASCII
 The bar code will show the actual Part Number
(OED4213-19.20M)

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



Reliability: Environmental Compliance

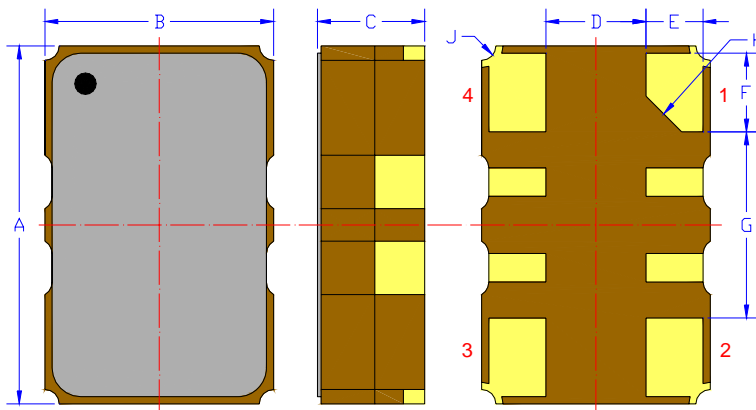
| Parameter | Condition |
|------------------|--------------------------------------|
| Mechanical Shock | MIL-STD-883 Method 2002, Condition B |
| Vibration | MIL-STD-883 Method 2007, Condition A |
| Solderability | MIL-STD-883 Method 2003 |
| Thermal Shock | MIL-STD-883 Method 1011, Condition A |

Electrical Specification for specified $V_{CC} = 3.3V \pm 5\%$ over the specified temperature range.

| Item | Min | TYP | Max | Unit | Condition |
|--|----------------------------|--|----------------------------|------------|--|
| Frequency Stability over temperature | -250 | - | 250 | ppb | Over -40°C to 85°C at fixed supply voltage + load (reference to midpoint min/max frequency) |
| Holdover | -250 -125 | 0 0 | 250 125 | ppb ppb | Over -40°C to 85°C for 24 hours Over $\pm 5^\circ\text{C}$ change for 24 hours |
| Frequency Calibration | -2.0 | - | 2.0 | ppm | Frequency offset at 25°C, 60 minutes after reflow. |
| Supply voltage stability | -10 | 0 | 10 | ppb | $\pm 2\%$ variation in supply voltage |
| Load sensitivity | -5 | - | 5 | ppb | 10K ohm $\pm 5\%$ 10 pF $\pm 10\%$ |
| Warm Up | - | 0.4 | 3.0 | S | Time to reach specified frequency |
| Aging rate following reflow | - - - | ± 10 ± 3 ± 1 | - - - | ppb/day | 1 day after reflow 7 days after reflow 30 days after reflow |
| Long term stability (Aging) | -1000 -1500 -4600 | - - - | 1000 1500 4600 | ppb | after 1 year after 5 years after 15 years |
| Output Waveform | CMOS | | | | |
| Output V_{HIGH} | 90 | - | - | %Vs | Load: 10K ohm $\pm 5\%$ 10 pF $\pm 10\%$ Vth: T_R and T_F 10% and 90% of amplitude Vth: D.C. 50% of amplitude |
| Output V_{LOW} | - | - | 10 | %Vs | |
| T_{RISE} and T_{FALL} | - | - | 6.5 | nS | |
| Duty Cycle | 40 | 50 | 60 | % | |
| Phase Noise 1 Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz | - - - - - - | -71 -93 -117 -138 -152 -155 | - - - - - - | dBc/Hz | at 25°C |
| Jitter | - | - | 0.6 | pS | Frequency offset from carrier 12kHz to 20MHz |
| V Supply Range ¹ V_{CC} | 3.13 | 3.30 | 3.47 | Volts | |
| Supply Current I_{CC} | - | - | 3.0 | mA | |
| Vcontrol Range | 0.5 | - | 2.50 | Volts | 1.50 volts nominal |
| Frequency Pullability | 5 | - | 10 | \pm ppm | Slope positive |
| Linearity | - | 0.05 | 2.0 | % | In accordance with MIL-PRF-55310 |
| Operating Temperature | -40 | - | +85 | °C | Widest range allowed |
| Storage Temperature | -55 | - | +95 | °C | |

Note: ¹ For correct operation a 10nF supply de-coupling capacitor should be placed next to the device.

Mechanical:



| | Inches | mm |
|----------------|--------------|------------|
| A | 0.197 ±0.008 | 5.00 ±0.20 |
| B | 0.126 ±0.008 | 3.20 ±0.20 |
| C | 0.059 max | 1.50 max |
| D ¹ | 0.055 | 1.40 |
| E ¹ | 0.031 | 0.80 |
| F ¹ | 0.043 | 1.10 |
| G ¹ | 0.102 | 2.60 |
| H ¹ | 0.013C | 0.50C |
| J ¹ | 0.008 | 0.20R |

Not to Scale

¹ Typical dimensions

Contacts:

Gold 11.8 to 39.4 μinches (0.3 to 1.0 μm)
over
Nickel 50 to 350 μinches (1.27 to 8.89 μm)

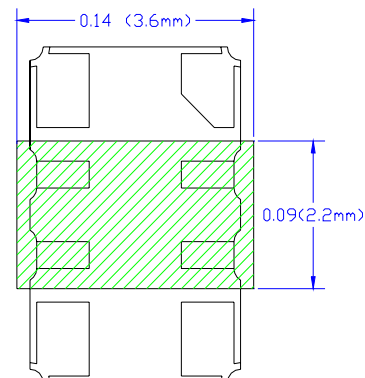
| Pad | Function | Note |
|-----|-----------------------------------|--|
| 1 | Vcontrol Input | If this function is not specified, recommend connecting this pad to ground. |
| 2 | Ground (GND) | |
| 3 | Output | CMOS |
| 4 | Supply Voltage (V _{CC}) | Connect an appropriate power supply bypass capacitors as close as possible. |
| - | N. C. | All other pads on the bottom shall not be connected. These are internally connected and were for the TCXO compensation process |

Layout and application information

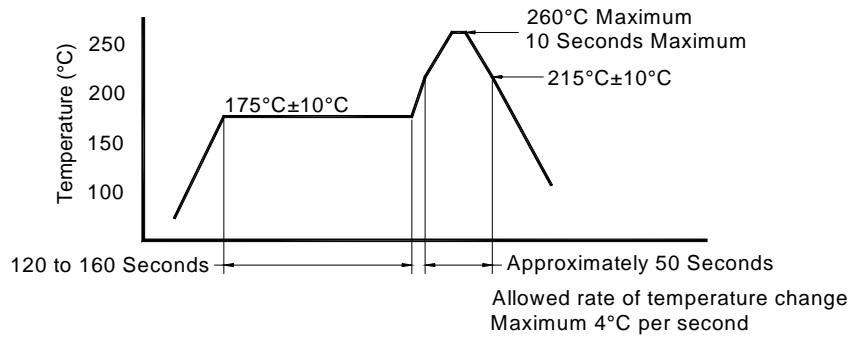
All connection points in the designated region have solder mask cover to avoid any electrical connections

For Optimum Stability and Jitter Performance, Pletronics recommends:

- a ground plane under the device
- no large transient signals (both current and voltage) should be routed under the device
- do not layout near a large magnetic field such as a high frequency switching power supply
- do not place near piezoelectric buzzers or mechanical fans.
- minimize air flow across the device



Reflow Cycle (typical for lead free processing)



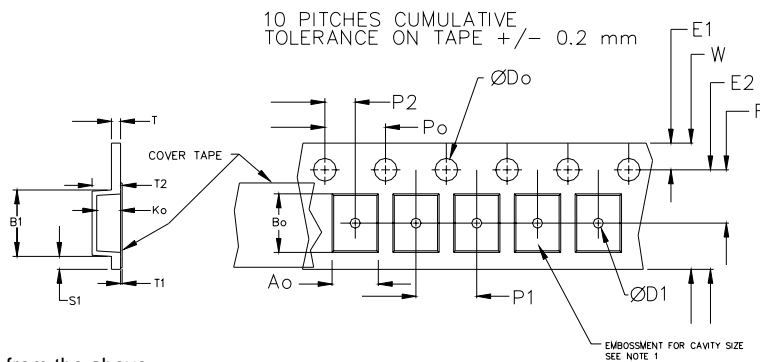
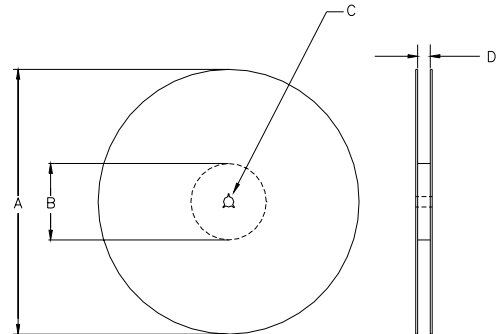
The part may be reflowed 2 times without degradation.

Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

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

| Variable Dimensions Table 2 | | | | | | | |
|-----------------------------|--------|--------|-----------|-----------|--------|-------|-------------|
| Tape Size | B1 Max | E2 Min | F | P1 | T2 Max | W Max | Ao, Bo & Ko |
| 16 mm | 12.1 | 14.25 | 7.5 ± 0.1 | 8.0 ± 0.1 | 8.0 | 16.3 | Note 1 |

Note 1: Embossed cavity to conform to EIA-481-B Dimensions in mm Not to scale



from the above

USER DIRECTION OF UNREELING →

| 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 | 16.4 +2.0 -0.0 | 16.4 +2.0 -0.0 | |

Reel dimensions may vary

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