

- Pletronics' OeA4 is from the OeXO™ Series of temperature compensated voltage controlled crystal oscillator with a CMOS output.
- Tape and Reel packaging is available
- 5 x 7 mm LCC Ceramic Package
- Supply Voltage: 3.3V

**Pletronics Inc. certifies this device is in accordance with the RoHS (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: 0.20 grams  
Moisture Sensitivity Level: 1 As defined in J-STD-020D.1  
Second Level Interconnect code: e4

## Absolute Maximum Ratings:

| Parameter                      | Unit                            |
|--------------------------------|---------------------------------|
| V <sub>CC</sub> Supply Voltage | -0.5V to +6.5V                  |
| V <sub>i</sub> Input Voltage   | -0.5V to V <sub>CC</sub> + 0.5V |
| V <sub>o</sub> Output Voltage  | -0.5V to V <sub>CC</sub> + 0.5V |



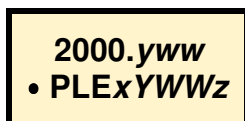
## Thermal Characteristics

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:



|      |   |                                          |
|------|---|------------------------------------------|
| 2000 | = | 20.00MHz, 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 device is marked as 20.0 MHz, but output frequency will be 10.0 MHz.

## 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 |

## Package Labeling

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

Font is Courier New

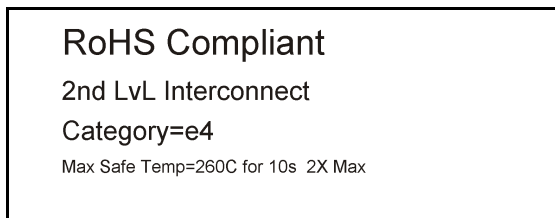
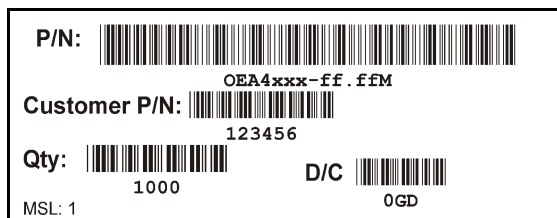
Bar code is 39-Full ASCII

The bar code will show the actual Part Number

OEA4219-10.00M

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

Font is Arial



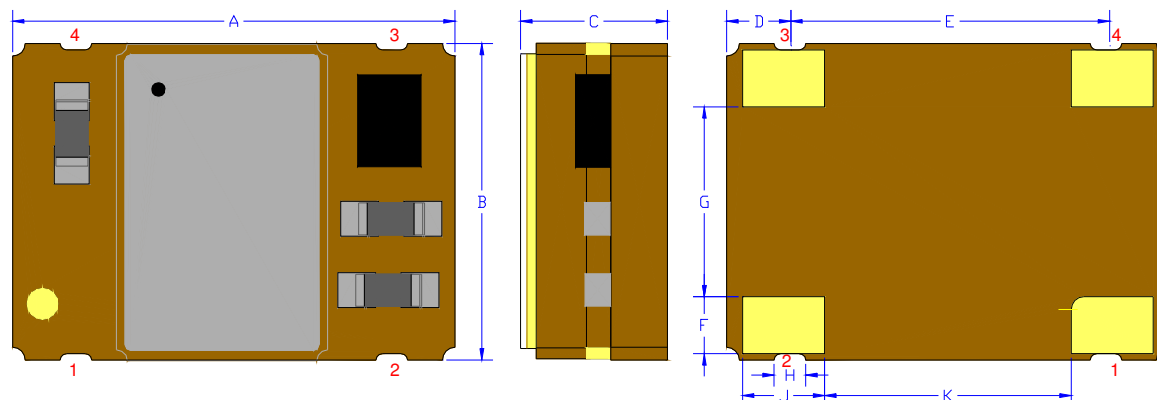
**Electrical Specification for specified Vcc=3.30V  $\pm 5\%$  over the specified temperature range.**

| Item                                        | Min       | TYP  | Max  | Unit      | Condition                                                                                                                                     |
|---------------------------------------------|-----------|------|------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Stability over temperature        | -1.0      | -    | 1.0  | ppm       | Over -40°C to 80°C at fixed supply voltage + load (reference to midpoint min/max frequency)                                                   |
| Holdover                                    | -1.0      | 0    | 1.0  | ppb       | Over -40°C to 80°C for 24 hours                                                                                                               |
| Frequency Calibration                       | -1.0      | -    | 1.0  | ppm       | Frequency offset at 25°C, 120 minutes after reflow. At 1.5 volts                                                                              |
| Supply voltage stability                    | -10       | 0    | 10   | ppb       | $\pm 2\%$ variation in supply voltage                                                                                                         |
| Load sensitivity                            | -5        | -    | 5    | ppb       | 10K ohm $\pm 10\%$    15 pF $\pm 10\%$                                                                                                        |
| Warm Up                                     | -         | 0.4  | 3.0  | S         | Time to reach specified frequency                                                                                                             |
| Long term stability (Aging)                 | -1000     | -    | 1000 | ppb       | after 1 year at 25°C                                                                                                                          |
| Output Waveform <sup>2</sup>                | CMOS      |      |      |           | see note2 for 50 ohm condition                                                                                                                |
| Output V <sub>HIGH</sub>                    | 90        | -    | -    | %Vs       | Load: 10K ohm $\pm 10\%$    15 pF $\pm 10\%$<br>Vth: T <sub>R</sub> and T <sub>F</sub> 10% and 90% of amplitude<br>Vth: D.C. 50% of amplitude |
| Output V <sub>LOW</sub>                     | -         | -    | 10   | %Vs       |                                                                                                                                               |
| T <sub>RISE</sub> and T <sub>FALL</sub>     | -         | -    | 4.0  | nS        |                                                                                                                                               |
| Duty Cycle                                  | 40        | 50   | 60   | %         |                                                                                                                                               |
| Phase Noise                                 | 1 Hz -    | -71  | -    | dBc/Hz    | at 25°C                                                                                                                                       |
|                                             | 10 Hz -   | -93  | -    |           |                                                                                                                                               |
|                                             | 100 Hz -  | -117 | -    |           |                                                                                                                                               |
|                                             | 1 KHz -   | -138 | -    |           |                                                                                                                                               |
|                                             | 10 KHz -  | -152 | -    |           |                                                                                                                                               |
|                                             | 100 KHz - | -155 | -    |           |                                                                                                                                               |
| V Supply Range <sup>1</sup> V <sub>CC</sub> | 3.13      | 3.30 | 3.47 | Volts     |                                                                                                                                               |
| Supply Current I <sub>CC</sub>              | -         | -    | 5.0  | mA        |                                                                                                                                               |
| Vcontrol Range                              | 0.5       | -    | 2.50 | Volts     | 1.50 volts nominal                                                                                                                            |
| Frequency Pullability                       | 6         | -    | -    | $\pm$ ppm | Slope positive                                                                                                                                |
| Linearity                                   | -         | 0.05 | 2.0  | %         | In accordance with MIL-PRF-55310                                                                                                              |
| Operating Temperature                       | -40       | -    | +80  | °C        | Widest range allowed                                                                                                                          |
| Storage Temperature                         | -55       | -    | +95  | °C        |                                                                                                                                               |

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

Note <sup>2</sup> CMOS output driver is tiny logic NC7SZ04 device. Drive approximately 12 dbm into 50 ohm port.

## Mechanical:



Not to Scale

| Pad | Function                          | Note                                                                                  |
|-----|-----------------------------------|---------------------------------------------------------------------------------------|
| 1   | Vcontrol Input                    | EFC, Electronic Frequency Control.                                                    |
| 2   | Ground (GND)                      |                                                                                       |
| 3   | Output                            |                                                                                       |
| 4   | Supply Voltage (V <sub>CC</sub> ) | Recommend connecting appropriate power supply bypass capacitors as close as possible. |

Contacts:

<sup>1</sup> Typical dimensions

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)

|                | Inches       | mm         |
|----------------|--------------|------------|
| A              | 0.276 ±0.006 | 7.00 ±0.15 |
| B              | 0.197 ±0.006 | 5.00 ±0.15 |
| C              | 0.099 max    | 2.50 max   |
| D <sup>1</sup> | 0.039        | 1.00       |
| E <sup>1</sup> | 0.197        | 5.00       |
| F <sup>1</sup> | 0.025        | 0.90       |
| G <sup>1</sup> | 0.118        | 3.00       |
| H <sup>1</sup> | 0.020        | 0.50       |
| J <sup>1</sup> | 0.051        | 1.30       |
| K <sup>1</sup> | 0.154        | 3.90       |

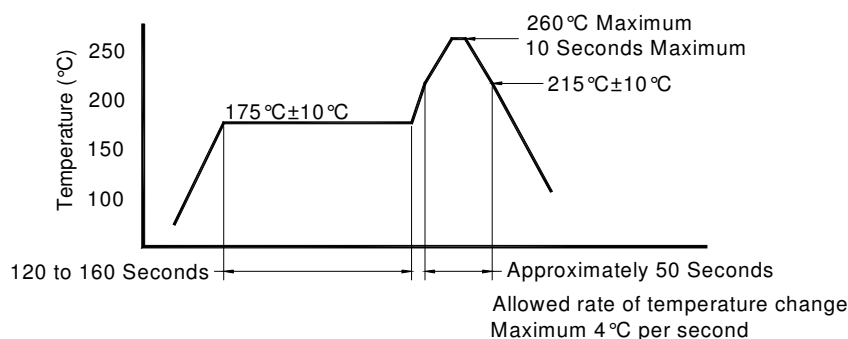
## Layout and application information

There are additional pads on the package bottom, these are **not to be connected to any traces** on the PCB, solder masking on the PCB should be used to make sure no contact is made.

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
- 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

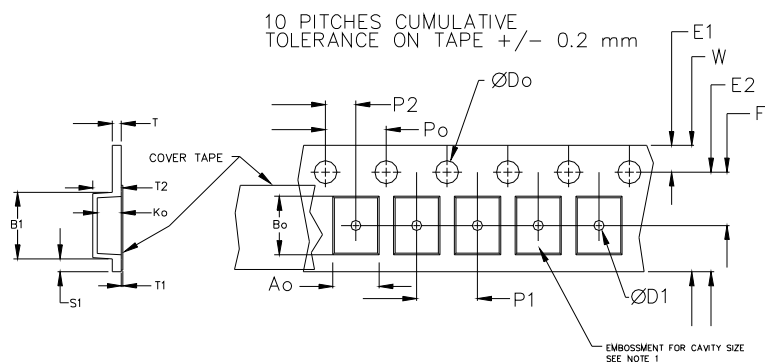
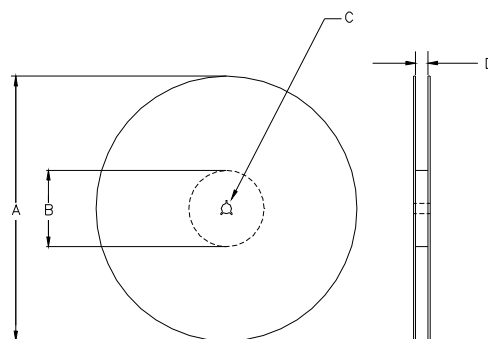
| Constant Dimensions Table 1 |     |        |      |     |              |        |       |        |
|-----------------------------|-----|--------|------|-----|--------------|--------|-------|--------|
| Tape Size                   | D0  | D1 Min | E1   | P0  | P2           | S1 Min | T Max | T1 Max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

| 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



| REEL DIMENSIONS |        |                  |                |                | Tape Width |
|-----------------|--------|------------------|----------------|----------------|------------|
| A               | inches | 7.0              | 20.0           | 13.0           |            |
|                 | mm     | 177.8            | 254.0          | 330.2          |            |
| B               | inches | 2.50             | 4.00           | 3.75           |            |
|                 | mm     | 63.5             | 101.6          | 95.3           |            |
| C               | mm     | 13.0 +0.5 / -0.2 |                |                | 16.0       |
| D               | mm     | 16.4 +2.0 -0.0   | 16.4 +2.0 -0.0 | 16.4 +2.0 -0.0 |            |
|                 |        |                  |                |                |            |

Reel dimensions may vary

from the above

USER DIRECTION OF UNREELING →

### **IMPORTANT NOTICE**

Pletronics Incorporated (PLE) reserves the right to make corrections, improvements, modifications and other changes to this product at anytime. PLE reserves the right to discontinue any product or service without notice. Customers are responsible for obtaining the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to PLE's terms and conditions of sale supplied at the time of order acknowledgment.

PLE warrants performance of this product to the specifications applicable at the time of sale in accordance with PLE's limited warranty. Testing and other quality control techniques are used to the extent PLE deems necessary to support this warranty. Except where mandated by specific contractual documents, testing of all parameters of each product is not necessarily performed.

PLE assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using PLE components. To minimize the risks associated with the customer products and applications, customers should provide adequate design and operating safeguards.

PLE products are not designed, intended, authorized or warranted to be suitable for use in life support applications, devices or systems or other critical applications that may involve potential risks of death, personal injury or severe property or environmental damage. Inclusion of PLE products in such applications is understood to be fully at the risk of the customer. Use of PLE products in such applications requires the written approval of an appropriate PLE officer. Questions concerning potential risk applications should be directed to PLE.

PLE does not warrant or represent that any license, either express or implied, is granted under any PLE patent right, copyright, artwork or other intellectual property right relating to any combination, machine or process which PLE product or services are used. Information published by PLE regarding third-party products or services does not constitute a license from PLE to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from PLE under the patents or other intellectual property of PLE.

Reproduction of information in PLE data sheets or web site is permissible only if the reproduction is without alteration and is accompanied by associated warranties, conditions, limitations and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. PLE is not responsible or liable for such altered documents.

Resale of PLE products or services with statements different from or beyond the parameters stated by PLE for that product or service voids all express and implied warranties for the associated PLE product or service and is an unfair or deceptive business practice. PLE is not responsible for any such statements.

### **Contacting Pletronics Inc.**

Pletronics Inc.  
19013 36<sup>th</sup> Ave. West  
Lynnwood, WA 98036-5761 USA

Tel: 425-776-1880  
Fax: 425-776-2760  
E-mail: [ple-sales@pletronics.com](mailto:ple-sales@pletronics.com)  
URL: [www.pletronics.com](http://www.pletronics.com)

Copyright © 2011, Pletronics Inc.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9