

- 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



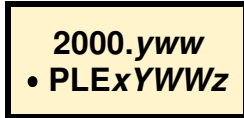
**Thermal Characteristics**

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

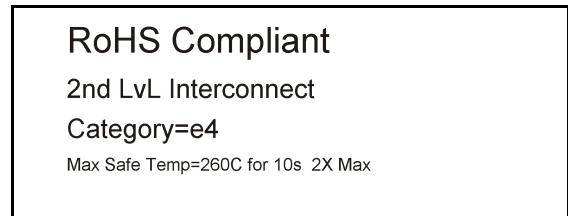
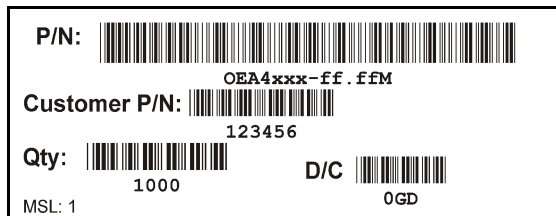
Bar code is 39-Full ASCII

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



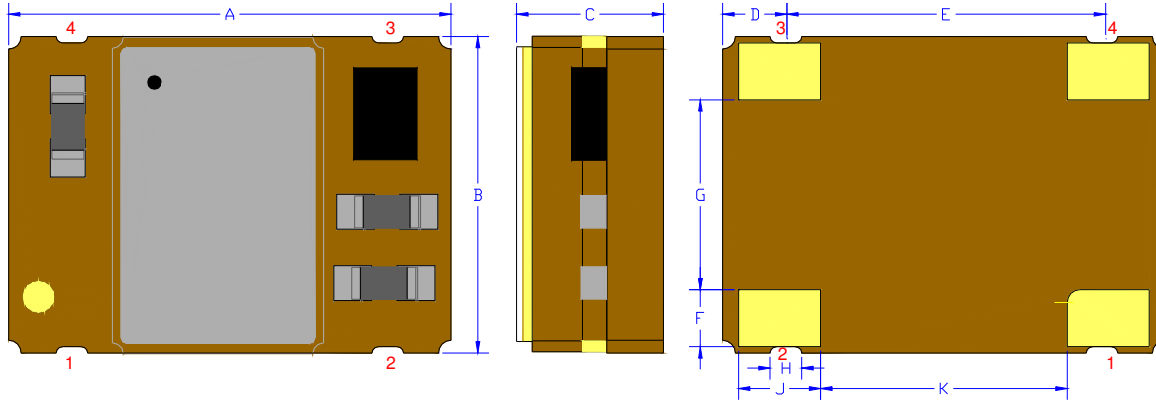
**Electrical Specification for specified  $V_{CC}=3.30V \pm 5\%$  over the specified temperature range.**

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 $V_{HIGH}$	90	-	-	%Vs	Load: 10K ohm $\pm 10\%$    15 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 $T_{FALL}$	-	-	4.0	nS	
Duty Cycle	40	50	60	%	
Phase Noise					at 25°C
1 Hz	-	-71	-	dBc/Hz	
10 Hz	-	-93	-		
100 Hz	-	-117	-		
1 KHz	-	-138	-		
10 KHz	-	-152	-		
100 KHz	-	-155	-		
V Supply Range <sup>1</sup> $V_{CC}$	3.13	3.30	3.47	Volts	
Supply Current $I_{CC}$	-	-	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

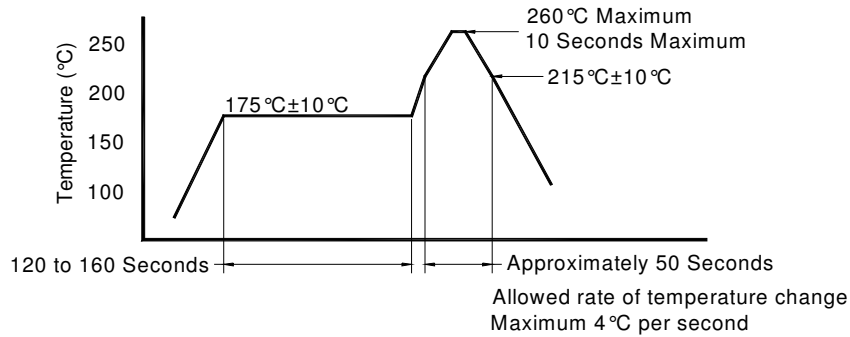
## Layout and application information

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)



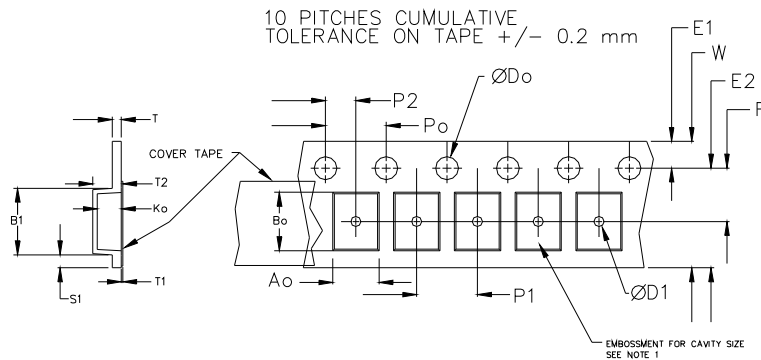
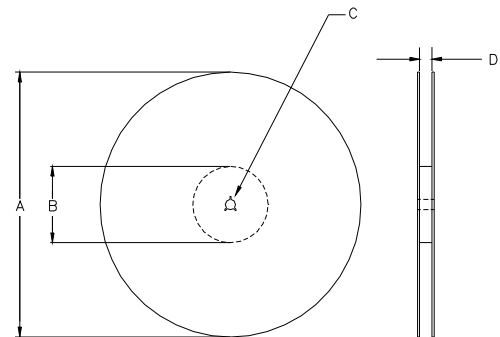
The part may be reflowed 2 times without degradation.

## 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 ± 0.05	0.6	0.6	0.1
12mm		1.5			2.0 ± 0.1			
16mm	+0.1 -0.0	1.5	± 0.1	± 0.1	2.0 ± 0.1			
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			
A	inches	7.0	20.0	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			
D	mm	16.4	16.4	16.4	16.0
		+2.0	+2.0	+2.0	
		-0.0	-0.0	-0.0	

Reel dimensions may vary

from the above

USER DIRECTION OF UNREELING →

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