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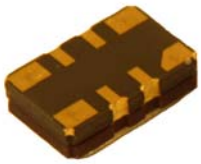


OeD4212-10.00M
TCVCXO Oscillator

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

Lead Free

Absolute Maximum Ratings:

Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +6.5V
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo 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:

2000.*yww*
• PLE*xYWWz*

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 actual part number is OED4212-10.00M where the model number “*212*” 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.

Note that the crystal frequency is 2 times the specified frequency of 10.00MHz. The TCVCXO IC used divides the crystal frequency be 2 resulting in a 10.00MHz output

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
(OED4212-10.00M)

P/N: OED4xxx-ff.ffM
Customer P/N: 123456
Qty: 1000
D/C 0GD
MSL: 1

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

RoHS Compliant
2nd LvL Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

Reliability: Environmental Compliance

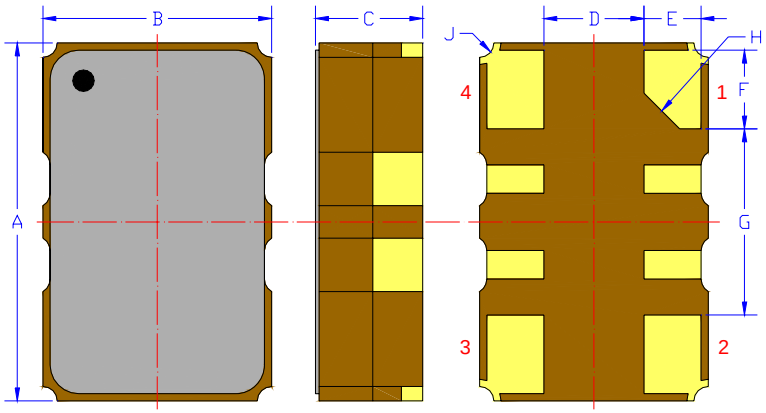
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

Electrical Specification for specified Vcc= 3.3V ±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 ±5°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	± 2% variation in supply voltage	
Load sensitivity	-5	-	5	ppb	10K ohm ±5% || 10 pF ±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 ±5% || 10 pF ±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	±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:



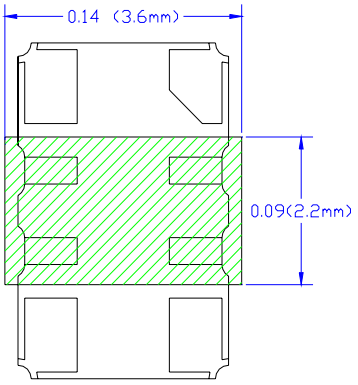
	Inches	mm
A	0.197 ±0.008	5.00 ±0.20
B	0.126 ±0.008	3.20 ±0.20
C	0.059 max	1.50 max
D[1]	0.0.55	1.40
E[1]	0.031	0.80
F[1]	0.043	1.10
G[1]	0.102	2.60
H[1]	0.013C	0.50C
J[1]	0.008	0.20R

Not to Scale

[1] Typical dimensions

Contacts:
Gold 11.8 to 39.4 µinches (0.3 to1.0 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



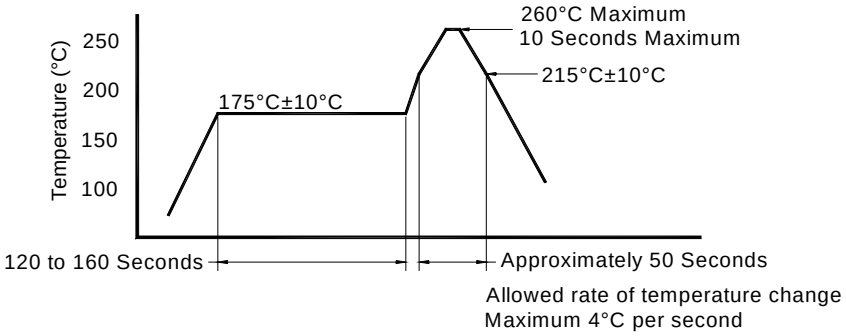
Layout and application information

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.

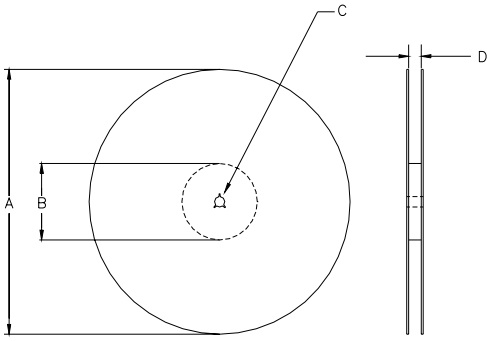
Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

Constant Dimensions Table 1

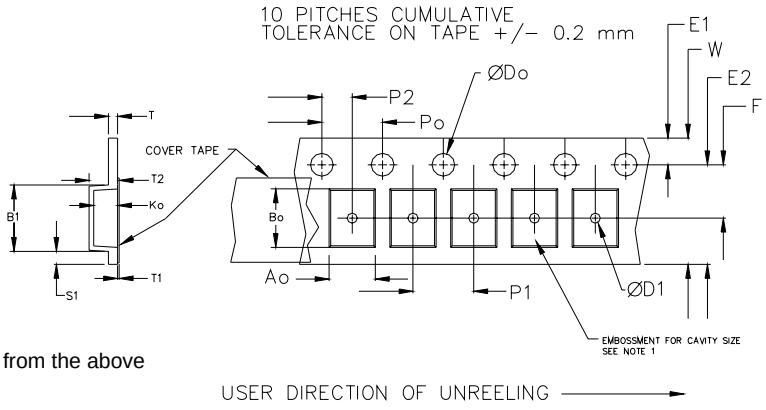
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5						
16mm		1.5			2.0 ±0.1			
24mm		1.5						

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	10.0	13.0	
	mm	177.8	254.0	330.2	
B	inches	2.50	4.00	3.75	
	mm	63.5	101.6	95.3	Tape Width
C	mm	13.0 +0.5 / -0.2			
D	mm	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.0

Reel dimensions may vary

from the above

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