

OeD4 Series TCVCXO Oscillator

July 2010

- Pletronics' OeD4 is from the OeXO™ Series of temperature compensated voltage controlled crystal oscillator with a CMOS output.
- Tape and Reel packaging is available
- OCXO equivalent Crystal Oscillator Series
- 3.2 x 5 mm LCC Ceramic Package
- Optional Voltage Control Function
- Supply Voltage range: 2.7V to 5.5V

Please submit your requirements to Pletronics for review and quotation

**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:



<i>ffff</i>	=	<i>ff.ff</i> frequency in MHz of the crystal
<i>yww</i>	=	Year and Week of the crystal manufacture
PLE	=	Pletronics
X	=	Model number, normally a "B"
<i>YWW</i>	=	Year and Week of assembly of the TCXO
Z	=	internal factory code

The actual part number is OED4xxx-ff.fffM where the model number "xxx" 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.

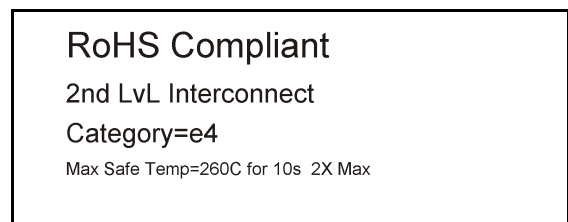
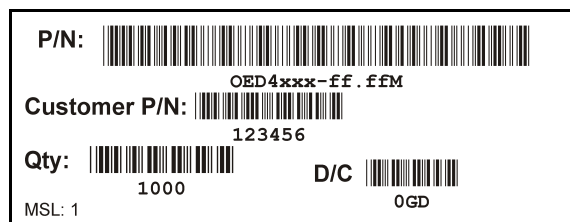
Reliability: Environmental Compliance

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

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



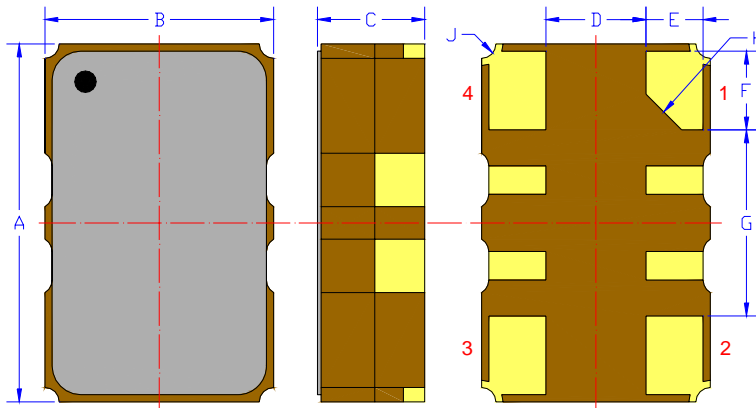
Electrical Specification for specified Vcc $\pm 5\%$ over the specified temperature range, typical stability options are listed.

Item	Min	TYP	Max	Unit	Condition	
Frequency Range	10	-	40	MHz		
Frequency Stability over temperature ²	-100 -250 -75 -50	- - - -	100 250 75 50	ppb	Over -40°C to 85°C Over -40°C to 85°C Over -20°C to 70°C Over 0°C to 70°C at fixed supply voltage + load (reference to midpoint min/max frequency)	
Holdover ²	-200 -100	0 0	200 100	ppb	Over -40°C to 85°C for 24 hours Over 0°C to 70°C 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	5K ohm $\pm 10\%$ 15 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 $\pm 5\%$ 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}	-	-	6.5	nS		
Duty Cycle	40	50	60	%		
Phase Noise	10 Hz 100 Hz 1 KHz 10 KHz	- - - -	-100 -120 -134 -144	- - - -	dBc/Hz	Typical values for a 26.0 MHz oscillator at 25°C
Jitter	-	-	0.6	pS	Frequency offset from carrier 12kHz to 20MHz	
V Supply Range ^{1,2} V _{CC}	2.7	3.3	5.5	Volts		
Supply Current ² I _{CC}	- - -	- - -	3.0 4.0 5.0	mA	10MHz 25MHz 40MHz	
Vcontrol Range	0.5	-	2.50	Volts	1.50 volts nominal	
Frequency Pullability	4.5	-	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.

² Typical capabilities shown. The OeXO™ datasheet for the specific device shows the specification for the specific part number.

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)

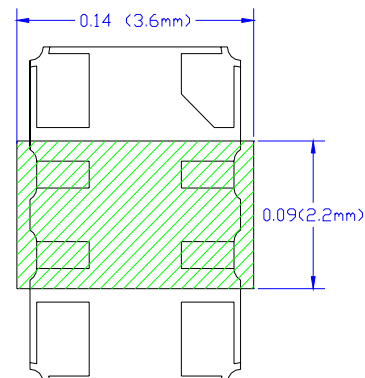
Pad	Function	Note
1	Vcontrol Input	If this function is not specified, recommend connecting this pad to ground.
2	Ground (GND)	
3	Output	CMOS
4	Supply Voltage (V _{CC})	Connect an appropriate power supply bypass capacitors as close as possible.
-	N. C.	All other pads on the bottom shall not be connected.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

Layout and application information

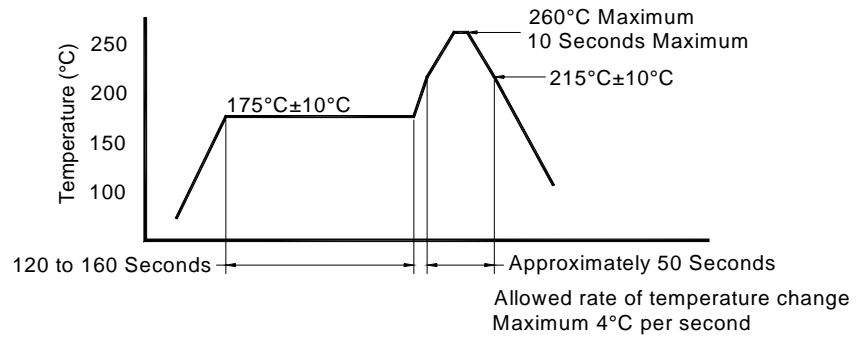
All connection points in the designated region have solder mask cover to avoid any electrical connections

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)



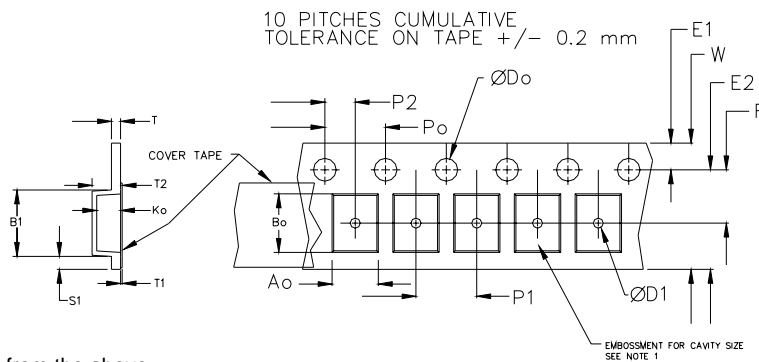
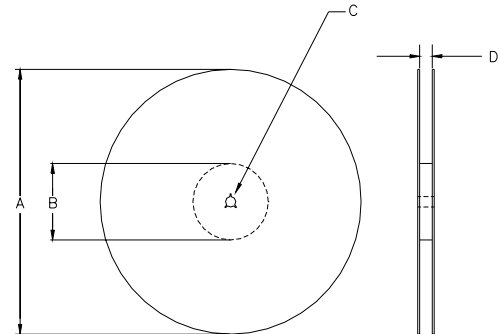
The part may be reflowed 2 times without degradation.

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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Contacting Pletronics Inc.

Pletronics Inc.
19013 36th Ave. West
Lynnwood, WA 98036-5761 USA

Tel: 425-776-1880
Fax: 425-776-2760
E-mail: ple-sales@pletronics.com
URL: www.pletronics.com

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