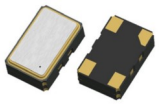
PLETRONICS OeD4304-10.0M OeXO® Oscillator



OeD4
3.2 x 5.0 x 1.85 mm
LCC Ceramic Package

Features

- Pletronics' OeXO® Series Ovenized *e*quivalent Temperature Compensated Crystal Oscillator
- Low Power / Fast Warm Up
- CMOS Output
- 3.3V nominal Supply Voltage
- 10.0 MHz nominal frequency

Applications

SONET / SDH / DWDM
Test & Measurement
Telecom Transmission & Switching Equipment
Base Stations / Picocell
Wireless Communication Equipment

Electrical Characteristics for CMOS

Parameter	Min	Typ	Max	Unit	Condition
Frequency	-	10.0	-	MHz	
Frequency Stability vs. Temperature	-0.25	-	+0.25	ppm	Over –40°C to +85°C; at fixed V_{CC} + load (reference to midpoint min/max frequency)
Frequency Initial Calibration		-	±2.0	ppm	
Operating Temperature Range	-40	-	+85	°C	
Supply Voltage [1] V_{CC}	-	3.3	-	Volts	± 5%
Supply Current I_{CC}	-	3.0	-	mA	Load: 10pF, V_{CC} ± 5%
Frequency Stability vs. Supply	-	-	±0.2	ppm	Load: 10 pF, V_{CC} ± 5%
Frequency Stability vs. Load	-	-	±0.2	ppm	Load: 10 pF ± 10%
Vcontrol Range	0.5	-	2.5	V	1.50 V nominal for V_{CC}
Frequency Pullability	±8.0	-	-	ppm	Positive Slope
Output Waveform		CMOS			
Duty Cycle	40	50	60	%	Load: 10 pF Vth: T_R and T_F 10% and 90% of amplitude Vth: D.C. 50% of amplitude
Output V_{HIGH}	90	-	-	%Vdd	
Output V_{LOW}	-	-	10	%Vdd	
Output T_{RISE} and T_{FALL}	-	-	6.5	nS	
Startup Time	-	-	10.0	mS	Within ± 2.0 ppm of final frequency
Long Term Stability (Aging)	-	-	±1.0	ppm	Per year at 25°C ± 2°C
Phase Noise 100 Hz 1 kHz 10 kHz 100 kHz	-	-120 -134 -144 -145	-	dBc/Hz	25°C ± 2°C at 20.0 MHz
Jitter	-	0.6	-	pS	Frequency offset from carrier 12 kHz to 20 MHz, Typical performance at 20.0 MHz
Storage Temperature Range	-55	-	+90	°C	

Note: [1] Place a 10nF power supply bypass capacitor next to device for correct operation

Device Marking

P*ff.ff*M

- *YMDxxx*

*ff.ff*M = Frequency in MHz
YMD = Date code (see table below)
P = Pletronics
x = Internal Factory Codes

Specifications such as part number, frequency stability, supply voltage and operating temperature range, etc. are not identified from marking.

External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Code	1	2	3	4	5	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2021	2022	2023	2024	2025	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Package Labeling

Tape and Reel available for quantities of 250 to 1000 per reel, cut tape for < 250. 16mm tape, 8mm pitch.

P/N Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

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

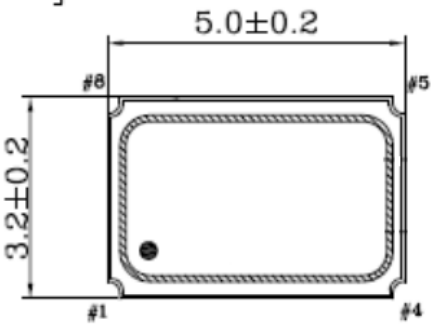
RoHS Compliant
2nd LvL Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

Pletronics Inc. certifies this device is in accordance with the RoHS 3 and WEEE 2 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
Second Level Interconnect code: e4

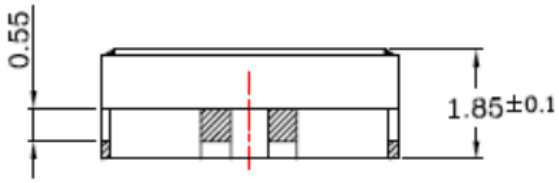
Mechanical Dimensions (mm)

[TOP VIEW]

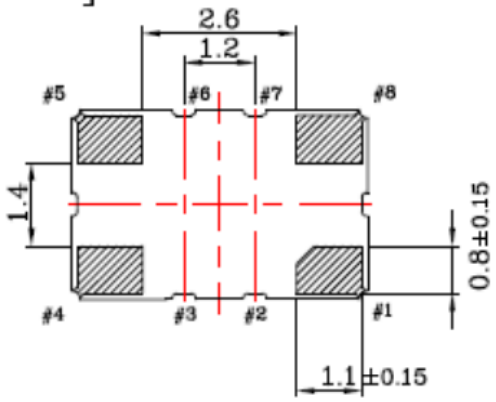


Pin 1 Mark

[SIDE VIEW]

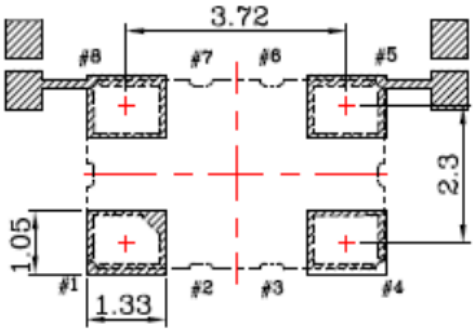


[BOTTOM VIEW]



Recommended soldering pattern

*To ensure optimal oscillator performance, place a by-pass capacitor of 0.1uF as close to the part as possible between Vdd and GND pads.



PIN#	FUNCTION
1	VCON:VC-TCXO NC:TCXO
4	GND
5	Fout
8	VDD

(Not to Scale)

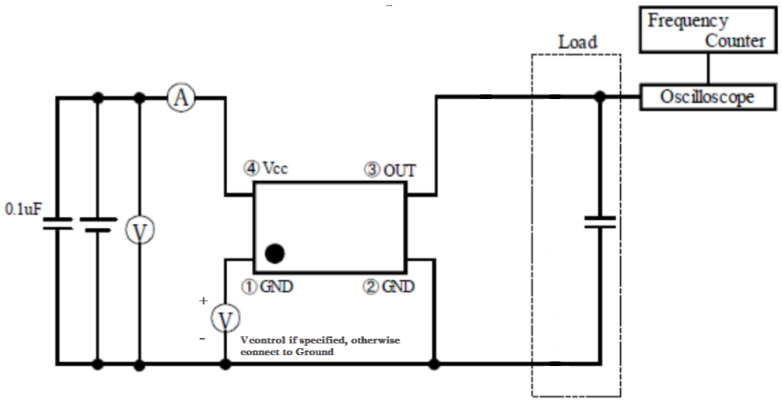
Contacts (pads): Gold 11.8 to 39.4 µinches (0.3 to 1.0 µm) over Nickel 50 to 350 µinches (1.27 to 8.89 µm)

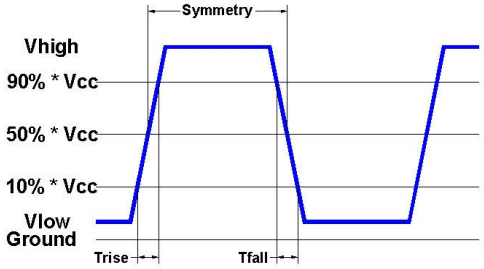
All connection points in the designated region have solder mask cover to avoid any electrical connections (top view shown)

For Optimum Jitter Performance, Pletronics recommends:

- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place 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

Electrical Test /Load Circuit





Environmental / ESD Ratings

Reliability: Environmental Compliance

Parameter	Condition
Mechanical Shock	JESD22-B104
Vibration	JESD22-B103
Solderability	IPC J-STD-002
Thermal Shock	MIL-STD-883 Method 1011, Condition A

ESD Rating

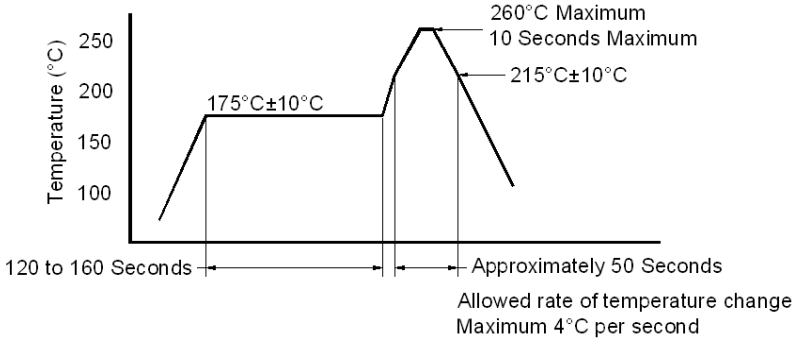
Model	Min. Voltage	Condition
Human Body Model	2000V	JESD22-A114
Charged Device Model	500V	JESD 22-C101
Machine Model	200V	JESD22-A115

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.

Absolute Maximum Ratings

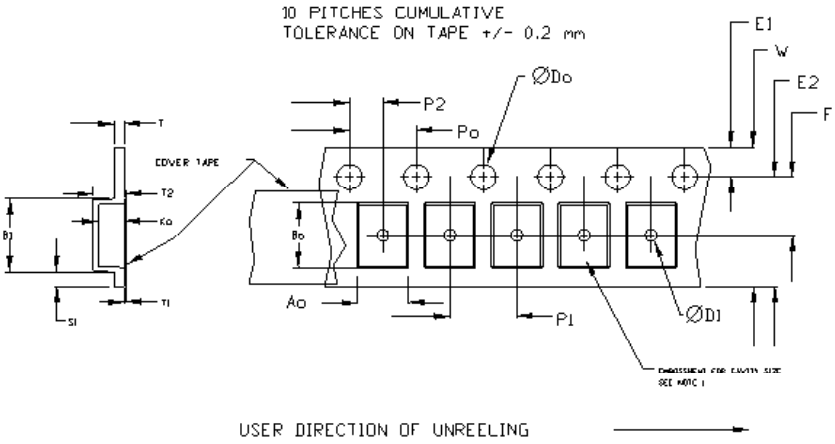
Parameter	Unit
V_{CC} Supply Voltage	-0.6V to +6V
Vi Input Voltage	-0.6V to V_{CC} + 0.6V
Io Output Current	-10mA to +10mA

Reflow Cycle



The part may be reflowed 2 times without degradation (typical for lead free processing).

Tape and Reel

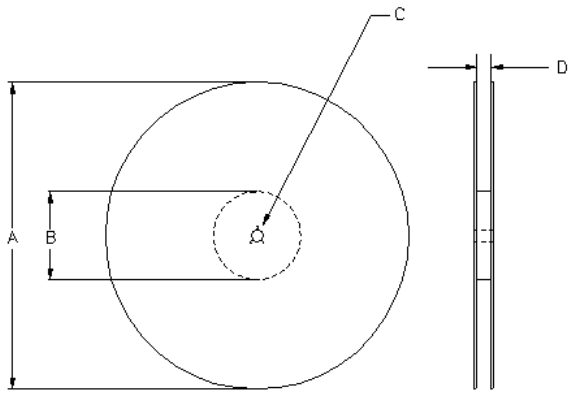


Tape Constant Dimensions Table 1								
Tape Size	Do	D1 min	E1	Po	P2	S1 min	T max	T1 max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5						
16mm		1.5			2.0 ±0.1			
24mm		1.5						

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

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA– 481-B



Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	177.8	2.50	63.5	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0
10	10.0	254.0	4.00	101.6		
13	13.0	330.2	3.75	95.3		

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 36th Ave. West
Lynnwood, WA 98036-5761
U.S.A.

Tel: 425.776.1880
Fax: 425.776.2760
email: ple-sales@pletronics.com

URL: www.pletronics.com