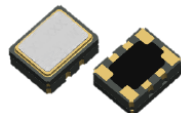




PLETRONICS OeE4 Series OeXO® Oscillator



OeE4
3.2 x 2.5 x 1.4 mm
LCC Ceramic Package

Features

- Temperature Compensated Crystal Oscillator
- Voltage Control Function option
- Low Power / Fast Warm Up
- CMOS Output or Clipped Sine Output
- 2.5V ~ 3.3V Supply Voltage options

Applications

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

Electrical Characteristics - Common

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range ²	10	-	40.0	MHz	Developed Frequencies: 10MHz, 20MHz, 25MHz, 40MHz. Consult sales for custom frequency availability.
Frequency Stability vs. Temperature ²	-	-	± 50 ± 100 ± 200	ppb	Over 0°C to +70°C Over -20°C to +70°C Over -40°C to +85°C at fixed V _{CC} + load (reference to midpoint min/max frequency)
Initial Frequency Calibration		-	± 2.0	ppm	At 25°C ± 2°C; V _{control} 1.50 volts if V _{control} option used
Operable Temperature Range	-40	-	+85	°C	
Supply Voltage ^{1,2} (V _{CC})	2.5	-	3.3	V	V _{CC} ± 5%
Frequency Stability vs Supply	-	-	± 0.2	ppm	V _{CC} ± 5%
Frequency Stability vs Load	-	-	± 0.2	ppm	Load ± 10%
V _{control} Range (V _c)	0.5	-	2.5	V	1.50 volts nominal
Frequency Pullability ² (V _{CTCXO})	± 5	-	-	ppm	Positive Slope
V _c Input Impedance	100	-	-	KΩ	
Linearity	-	-	±2.0	%	
Startup Time	-	-	10.0	mS	Within ± 2.0 ppm of final frequency
Output Enable (Pad 6) (V _{IH})	0.7V _{CC}	-	-	V	Output Active (If Pad 6 open, output also active)
Output Disable (Pad 6) (V _{IL})	-	-	0.3V _{CC}	V	Output disabled to Hi-Z state
Long Term Stability (Aging)	-	-	± 1.0	ppm	First year at 25°C ± 2°C
Phase Noise	100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	-	-122 -142 -154 -157 -159	-	dBc/Hz 25°C ± 2°C at 20.0 MHz
Phase Jitter, rms	-	0.3	-	pS	Frequency offset from carrier 12 kHz to 5 MHz; Typ at 20MHz
G sensitivity	-	0.3	0.5	ppb/g	Each axis, 20 ~ 2000 Hz
Storage Temperature Range	-55	-	+125	°C	

Electrical Characteristics - CMOS Output

Supply Current	-	-	7.5	mA	Output Load: 15 pF
Duty Cycle	45	50	55	%	V _{th} : TR and TF 10% and 90% of V _{CC} V _{th} : D.C. 50% of V _{CC} Output Load: 15 pF
Output V _{HIGH} (V _{OH})	90	-	-	%V _{CC}	
Output V _{LOW} (V _{OL})	-	-	10	%V _{CC}	
Output T _{RISE} and T _{FALL}	-	-	6.5	nS	

Electrical Characteristics - Clipped Sine Output

Output Load	[10 kΩ // 10pF] ± 10%				
Supply Current	-	-	5.0	mA	Load: 10 kΩ // 10pF
Output Level	0.8	-	-	V _{p-p}	Load: 10 kΩ // 10pF

Note: ¹ Place a 10nF power supply bypass capacitor next to device for correct operation
² A unique datasheet is created for each specific device. See Factory for other options.



Package Labeling

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

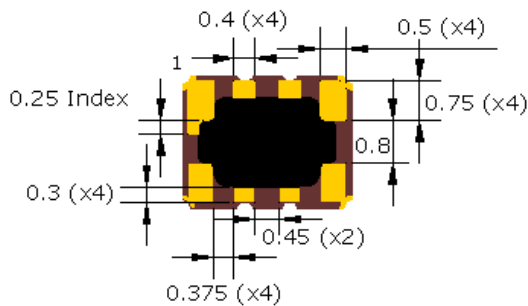
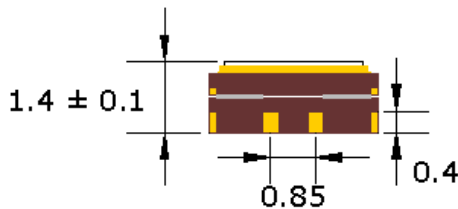
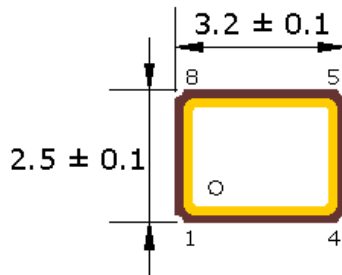
RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial



Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

Mechanical Dimensions

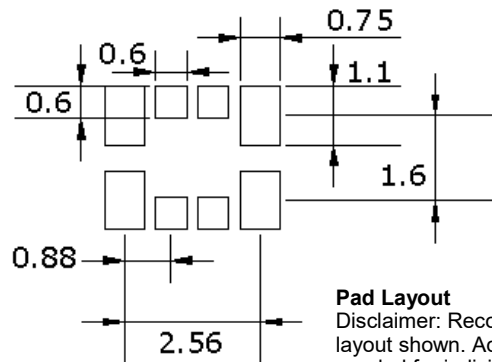


Pin Connections	
PIN#	Function
1	Vc: VCTCXO or NC: TCXO
2	No connect
3	No Connect
4	Ground / Lid
5	Output
6	Enable / Disable
7	Filter (optional)*
8	Vcc

*33nF capacitor required if this option is selected

ENABLE/DISABLE	
PIN 6 Level	Output State
V _{IH} /Open	Active
V _{IL} /Gnd	Disabled/Tristate

Recommended solder layout



Pad Layout
Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

Dimensions in mm

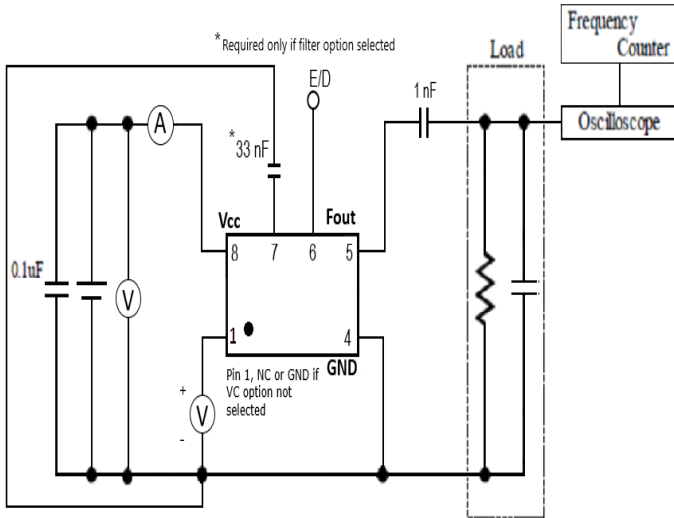
Contacts (pads): Gold (0.3 to 1.0 μm) over Nickel 1.27 to 8.89 μm)

For Optimum Jitter Performance, Pletronics recommends:

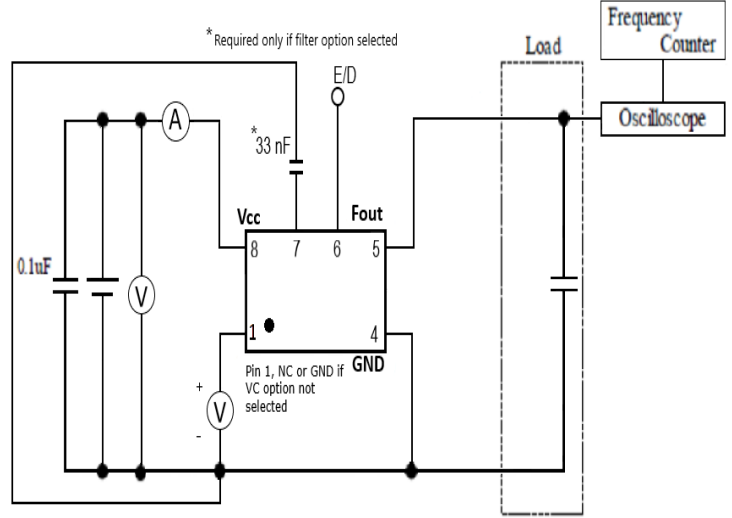
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans
- Minimize air flow across the device

Electrical Test /Load Circuit

Clipped Sine Wave



CMOS



Environmental / ESD Ratings

Reliability: Environmental

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

ESD Rating

Model	Min. Voltage	Condition
Human Body Model	2000V	JESD22-A114
Machine Model	200V	JESD22-A115

Absolute Maximum Ratings

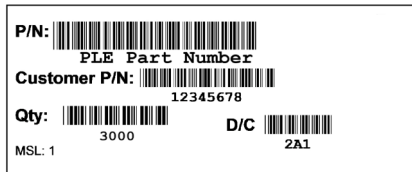
Parameter	Unit
V _{CC} Supply Voltage	-0.6V to +4.6V
V _i Input Voltage	-0.6V to V _{CC} + 0.6V
I _o Output Current	-10mA to +10mA

Thermal Characteristics:

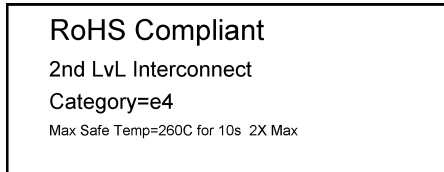
The maximum die or junction temperature is 125°C

Package Labeling

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

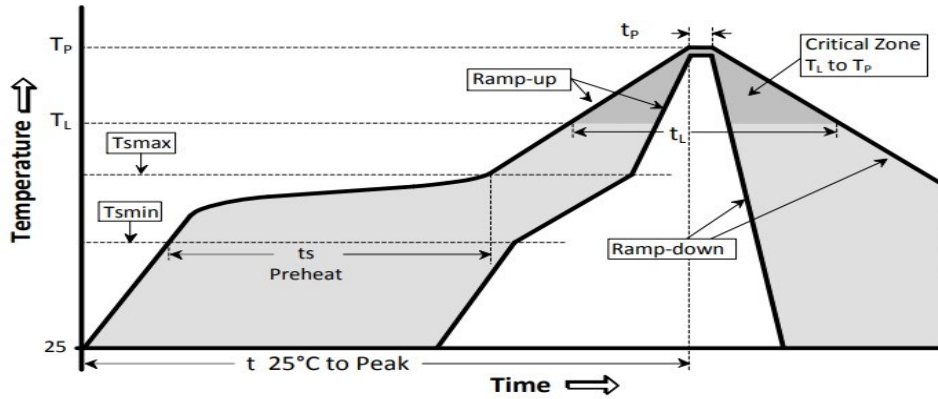


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Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

Reflow Cycle

Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"

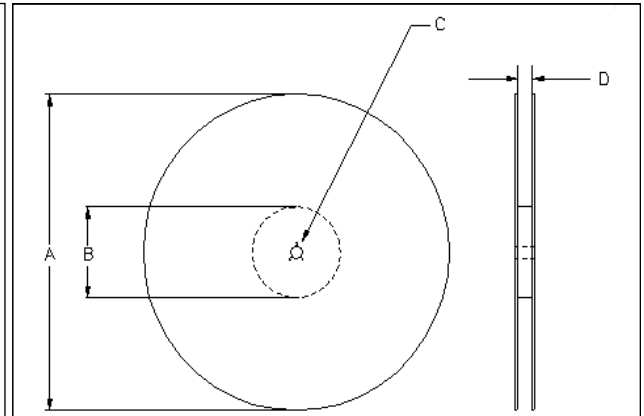
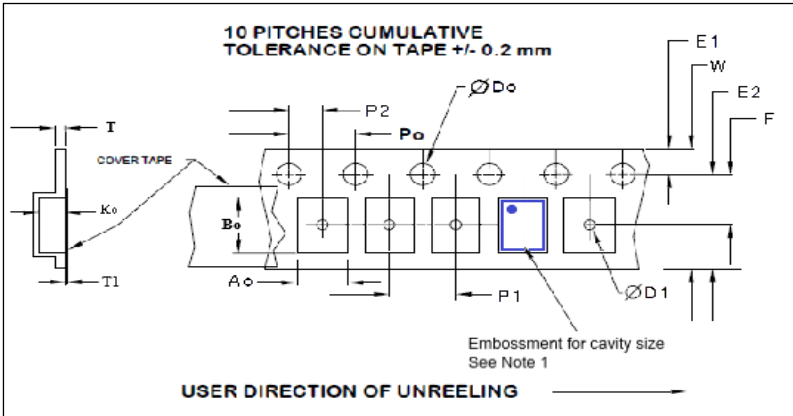


The part may be reflowed 2 times. (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	($T_{S_{max}}$ to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to-peak}$	8 minutes max	min
Preheat			
Temperature min	$T_{S_{min}}$	150	°C
Temperature max	$T_{S_{max}}$	200	°C
Time $T_{S_{min}}$ to $T_{S_{max}}$	t_s	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	T_P	260	°C
Time within 5°C of peak temperature	t_p	20 – 40	sec

Tape and Reel

Tape and Reel available for quantities of 250 to 3000 per reel, cut tape for < 250. 12mm tape, 8mm pitch.



Tape Variable Dimensions Table 2

Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
12mm	10.25	5.5 ±0.05	8.0 ±0.1	12.2	2.9±0.1	3.6±0.1	1.7±0.1

Reel Dimensions (may vary) Table 3

Reel Size	A		B		C	D
	Inches	mm	Inches	mm	mm	mm
7	7.0	180	2.50	60	13.0 ±0.3	13 ± 0.3

Dimensions in mm Drawing Not to scale

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

Tape Constant Dimensions Table 1

Tape Size	Do	D1 min	E1	Po	P2	T max	T1 max
12mm	1.5 ±0.05	1.5	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.3	0.1



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