

CTXXPL3  
3.2 x 2.5 x 1.6 mm  
Leadless Ceramic Package

### Features

- Quartz crystal controlled PLL Based TCXO
- LVDS Output
- Enable/Disable Function on pad 1
- 2.5V and 3.3V Supply Voltage

### Applications

Driving A/Ds, D/As, FPGAs  
Fibre Channel  
Ethernet, GbE, SynchE  
Medical  
Storage Area Networking  
COTS  
Telecom  
PON

### Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range	10		1500	MHz	
Frequency Stability	±2.0	-	±2.5	ppm	Specified by part number; (fmax - fmin) / 2
Operating Temperature Range	-40	-	+85	°C	See Part Number guide for options
Storage Temperature Range	-55		+125	°C	
Supply Voltage <sup>1</sup> VDD	2.375 2.97	2.5 3.3	2.625 3.63	V	TVDD ramp = 100µs min
Supply Current IDD	-		40 50	mA	2.5V 3.3V
Output Waveform	LVDS				Output load: 100 ohms
Differential Output Voltage (VOD)	175	350		mV	
Offset Voltage (VOS)		1.25		V	
Output TRISE and TFALL			1.0	ns	Vth is 20% and 80% of VOD
Disable Current		16		mA	When output disabled (pin 2 low)
Startup Time	-	-	10	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	Referenced to 50% of VOD or crossing point
V <sub>DISABLE</sub> (VIL)	-	-	0.3*VDD	V	Referenced to Ground
V <sub>ENABLE</sub> (VIH)	0.7*VDD	-	-		
Phase Noise	100Hz 1kHz 10kHz 100kHz 1MHz 5MHz 20MHz	- -111 -116 -117 -137 -140 -150	-	dBc/Hz	25°C ± 2°C, 3.3V, 156.25MHz
Phase Jitter	-	0.9	-	ps rms	12 kHz to 20 MHz from the output frequency; Fo ≥ 40MHz
Aging	-	-	±1.0	ppm	Per year, +25°C ± 2°C

### Part Number

**Example: CTXXPL3LZLD-100.0**

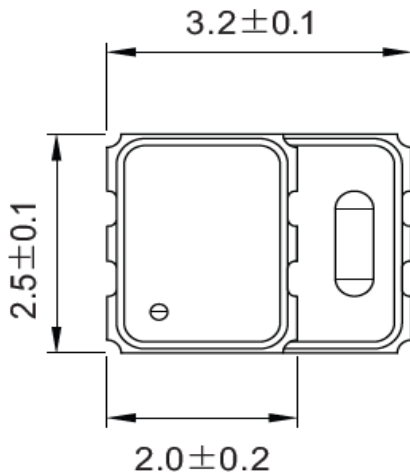
Series Model	Output	Package Size	Supply Voltage	Packaging	Operating Temperature Range	Frequency Stability	Frequency (MHz)
CTXXP	L	3	L	Z	L	D	100.0
	L = LVDS	3 = 3.2 x 2.5mm	S = 2.5V L = 3.3V	Blank = Tape only Z = Tape/Reel	C = -20 to +70°C H = -30 to +75°C D = -30 to +85°C L = -40 to +85°C	C = ±2.0 ppm D = ±2.5 ppm	

Notes: Specifications with Pad 1 E/D open circuit

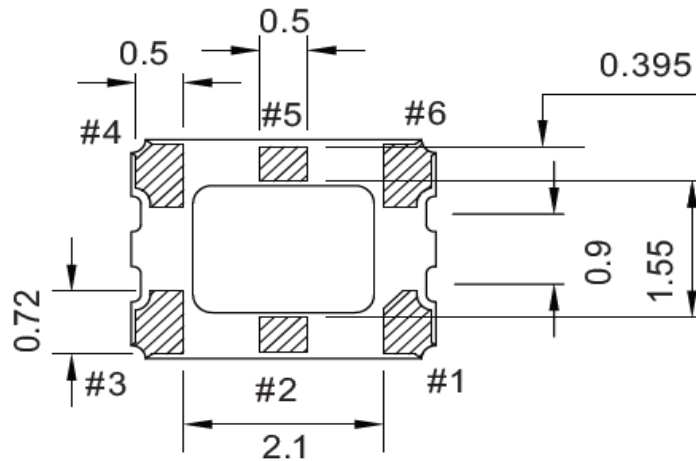
<sup>1</sup> Place an appropriate power supply bypass capacitor next to device for correct operation

### Mechanical Dimensions (mm)

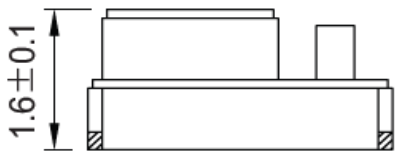
[ TOP VIEW ]



[ BOTTOM VIEW ]



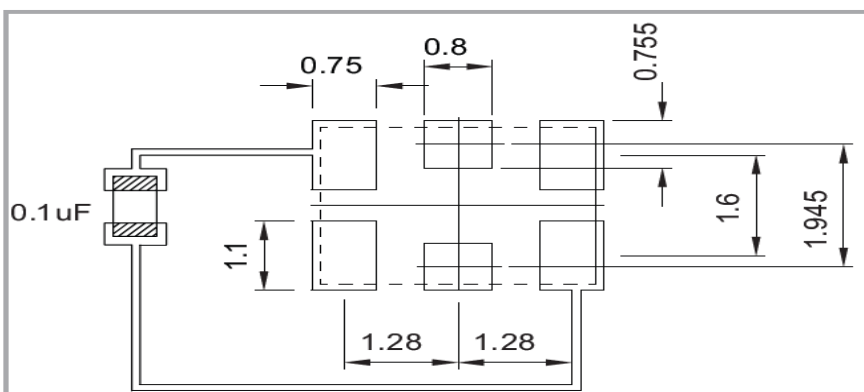
[ SIDE VIEW ]



Type	Differential
Pad	Function
1	No Connection
2	Tri-State
3	GND
4	Output
5	Comp. Output
6	VDD

Enable/Disable	
Pin 2	Output
Open	Active
Logic '1'	Active
Ground	Tri-state

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



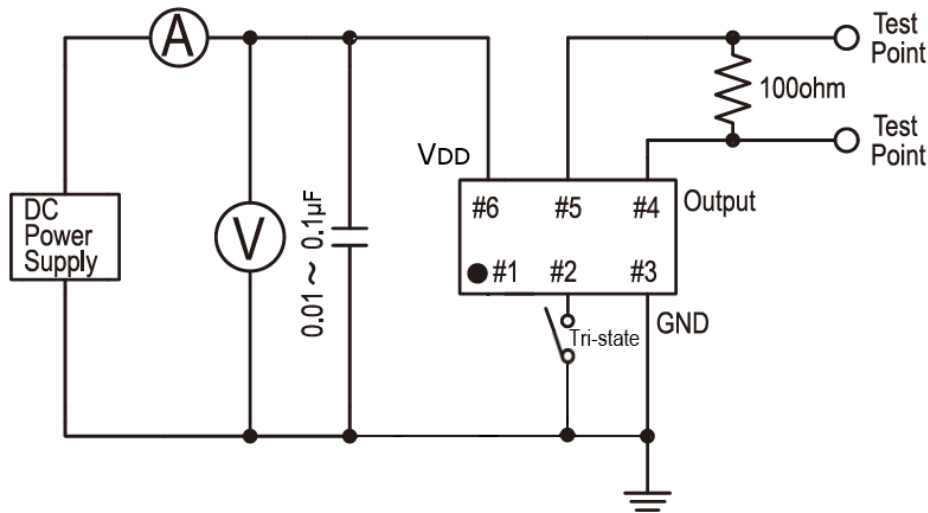
To ensure optimal oscillator performance, place a by-pass capacitor of 0.1 μF as close to the part as possible between Vdd and GND pads.

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

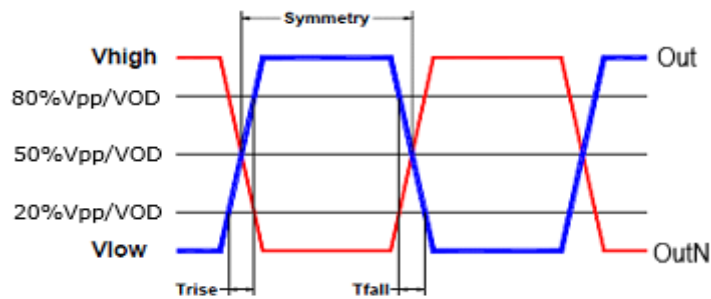
For Optimum Jitter Performance, Cardinal recommends:

- 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

### Electrical Test /Load Circuit



Test Waveform



### Environmental/ESD

Reliability: Environmental

Parameter	Reference Standard	Test Condition
Vibration	MIL-STD-883 2007 Condition A	10-2000Hz, 1.52mm, 20g, each axis for 4hrs
Thermal Shock	MIL-STD-883 1010 Condition B	-55°C, 125°C, soak time is 10 mins, with total 200 cycles
Mechanical Shock	MIL-STD-883 2002 Condition B	1500g, half-sine, 0.5ms, each axis for 3 times

#### Absolute Maximum Ratings

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +4.2V
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
Max Junction Temperature	125°C

#### ESD Rating

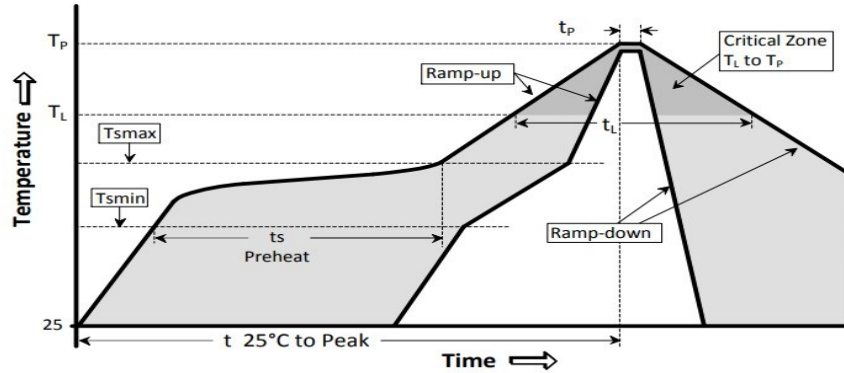
Model	Min. Voltage	Condition
Human Body Model	2000V	JESD22-A114
Charged Device Model	1000V	JESD22-C101
Machine Model	120V	JESD22-A115

Cardinal Components certifies this device is in accordance with the RoHS and REACH directives.

Cardinal Components guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
 Weight of the Device: 0.029 grams  
 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"

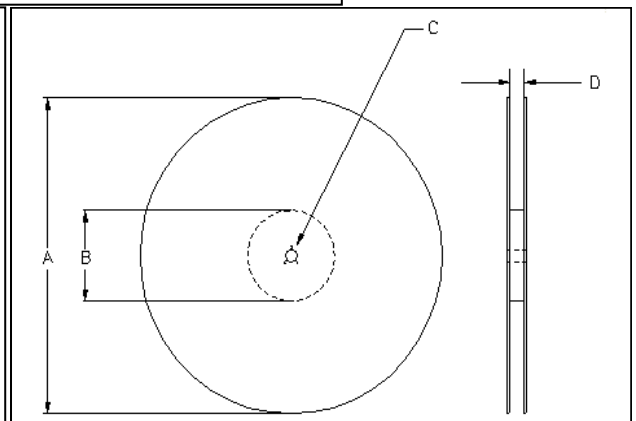
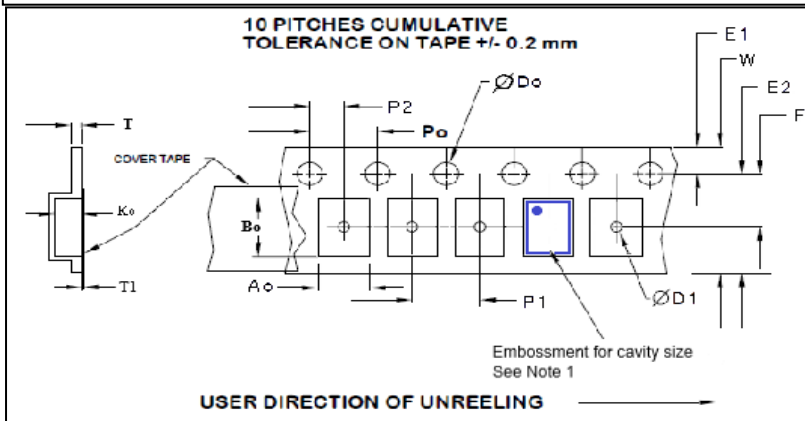


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	$(T_{S_{max}} \text{ to } T_p)$	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
<b>Preheat</b>			
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
<b>Soldering above liquidus</b>			
Temperature liquidus	$T_l$	217	°C
Time above liquidus	$t_l$	60 – 150	sec
<b>Peak temperature</b>			
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, 4mm pitch.



Tape Variable Dimensions Table 2

Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
12mm	10.25	5.5 ± 0.05	4.0 ± 0.1	12.2	2.9 ± 0.1	3.6 ± 0.1	1.7 ± 0.1

Dimensions in mm Drawing Not to scale

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

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 +0.5 -0.2	Tape size +0.4 +2.0 -0.0

Tape Constant Dimensions Table 1

Tape Size	Do	D1 min	E1	Po	P2	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	0.3	0.1

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**Contacting Cardinal Components**

Cardinal Components  
19013 36th Ave. West  
Lynnwood, WA 98036-5761  
U.S.A.

Tel: 973-785-1333  
Fax: 425-776-2760  
email: [sales@cardinalxtal.com](mailto:sales@cardinalxtal.com)  
URL: [www.cardinalxtal.com](http://www.cardinalxtal.com)