

CTX2
2.0 x 1.6 x 0.7 mm
LCC Ceramic Package

Features

- Temperature Compensated Crystal Oscillator
- Optional Voltage Control Function
- Clipped Sine Wave Output
- 1.8V to 3.3V nominal Supply Voltage
- 10 - 40 MHz Frequency

Applications

GPS
WiMAX, Wi-Fi, Wi-LAN
Handsets
Broadband Access
Point to point radios
Seismic Exploration
Wireless Communications
Base Stations
Test Equipment

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition (Consult factory for other options)
Frequency Range	10	-	40	MHz	Specified by part number
Frequency Stability vs. Temperature	±0.5	-	±2.5	ppm	Specified by part number $(f_{max} - f_{min}) / 2$
Frequency Initial Calibration	-	-	±2.0	ppm	Vcontrol 1.50 volts at 25°C ± 2°C when V _{CC} ≥ 2.5 volts Vcontrol 0.9 volts at 25°C ± 2°C when V _{CC} = 1.8 volts If Vcontrol used
Operable Temperature Range	-40	-	+85	°C	Specified by part number, Consult factory for wider range
Supply Voltage ¹ V _{CC}	1.8	-	3.3	V	± 5%, Specified by part number
Supply Current I _{CC}	-	2.0	3.0	mA	Load: 10 Kohm 10 pF, V _{CC} ± 5%
Frequency Stability vs. Supply	-	-	±0.2	ppm	Load: 10 Kohm 10 pF, V _{CC} ± 5%
Frequency Stability vs. Load	-	-	±0.2	ppm	Load: [10 Kohm 10 pF] ± 10%
Vcontrol Range	0.50 0.30	1.50 0.90	2.50 1.50	V	1.50 volts nominal for V _{CC} nominal ≥ 2.5 volts 0.9 volts nominal for V _{CC} nominal = 1.8 volts
Frequency Pullability ²	0	±8.0	±12.0	ppm	Specified by part number, Positive Slope
Output Waveform	Clipped Sine Wave				DC Coupled
Output Level	0.8	-	-	V p-p	Load: [10 Kohm 10 pF] ± 10%
Startup Time	-	-	10.0	mS	Within ± 2.0 ppm of final frequency
Long Term Stability (Aging)	-	-	±1.0	ppm	First year at 25°C ± 2°C
Phase Noise	100 Hz 1 kHz 10 kHz 100 kHz	-110 -130 -145 -145	-	dBc/Hz	25°C ± 2°C at 26.0 MHz
Storage Temperature Range	-55	-	+85	°C	

Notes:

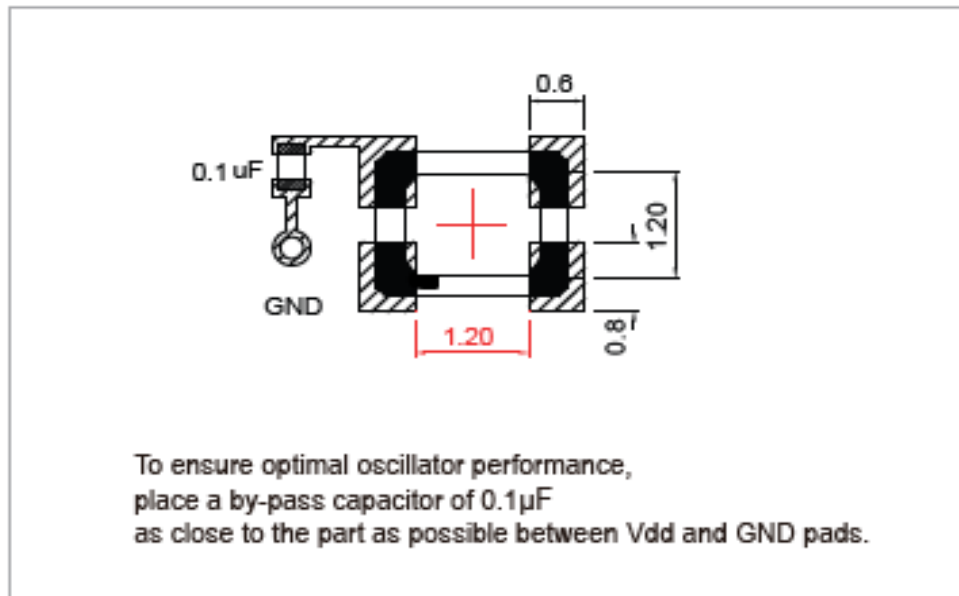
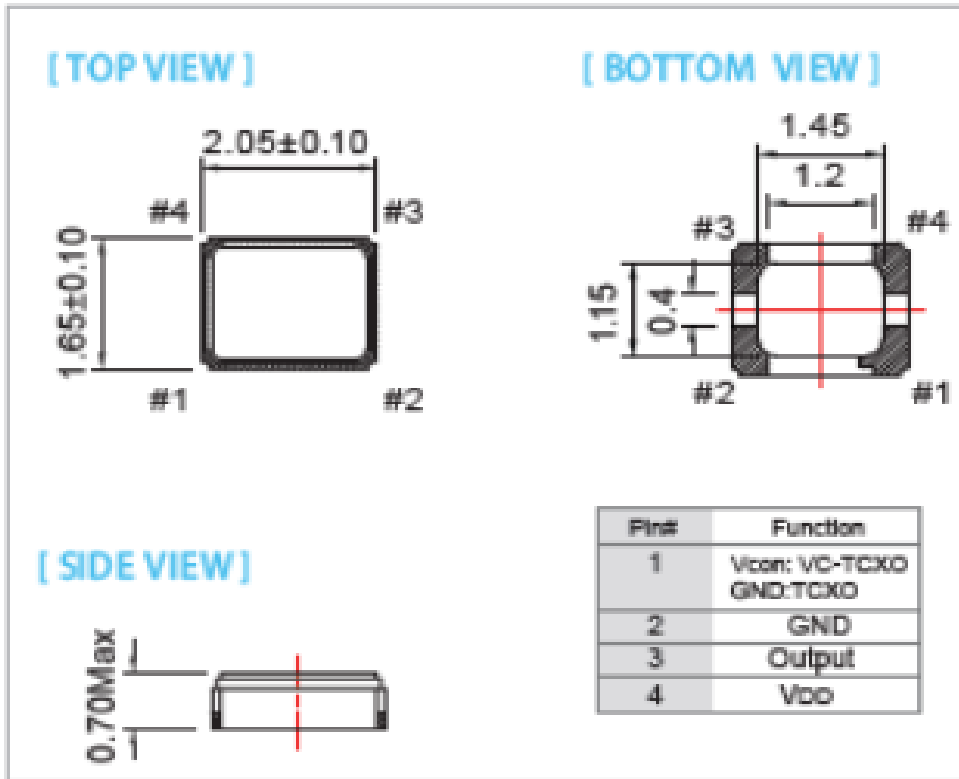
¹ Place an appropriate power supply bypass capacitor next to device for correct operation

Part Number (Example: CTX2SLZ-A7B4M-20.0)

Series Model	Output	Voltage	Packaging	Operating Temperature	Stability	Pullability	Frequency (MHz)
CTX2	S	L	Z	A7	B4	M	20.0
	S = Clipped Sine	L = 3.3V S = 2.5V K = 1.8V	Z = Tape/reel Blank=Tape Only	A3 = -30 ~ +75°C A5 = -20 ~ +70°C A6 = -30 ~ +85°C A7 = -40 ~ +85°C	B3 = ±2.5ppm B4 = ±2.0ppm B5 = ±1.5ppm B6 = ±1.0ppm B7 = ±0.5ppm	Blank = TCXO M = ± 5ppm min N = ± 8ppm min	10 - 40 MHz

Contact Factory for non-standard specifications. Not all combinations may be possible.

Mechanical Dimensions (mm)



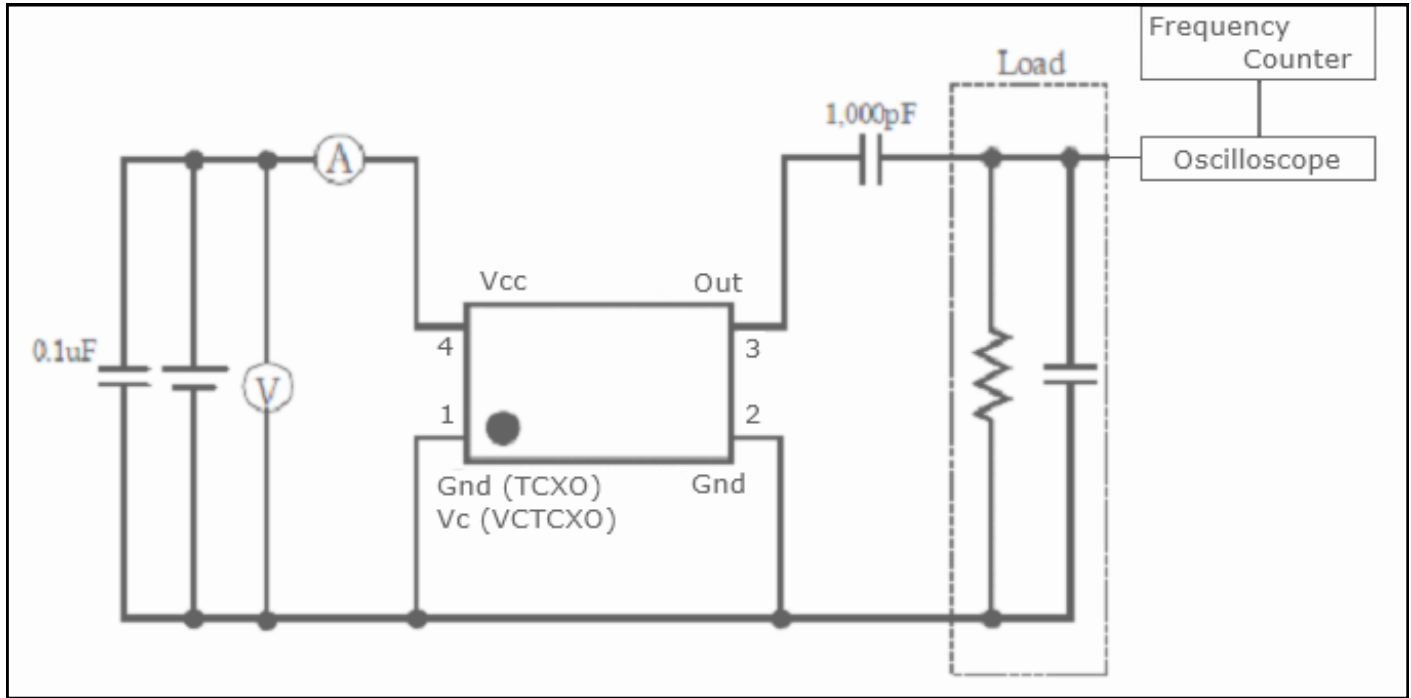
Pad Layout
Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

Termination Finish: Gold plating (0.3~1 μ m) over Nickel plating (1.27~8.87 μ m)

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



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:

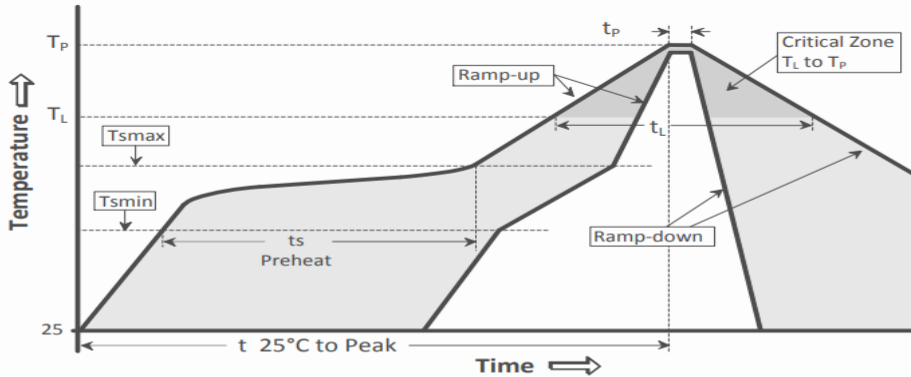
The maximum die or junction temperature is 125°C

Cardinal Components Inc. 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: 0.0.008 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"

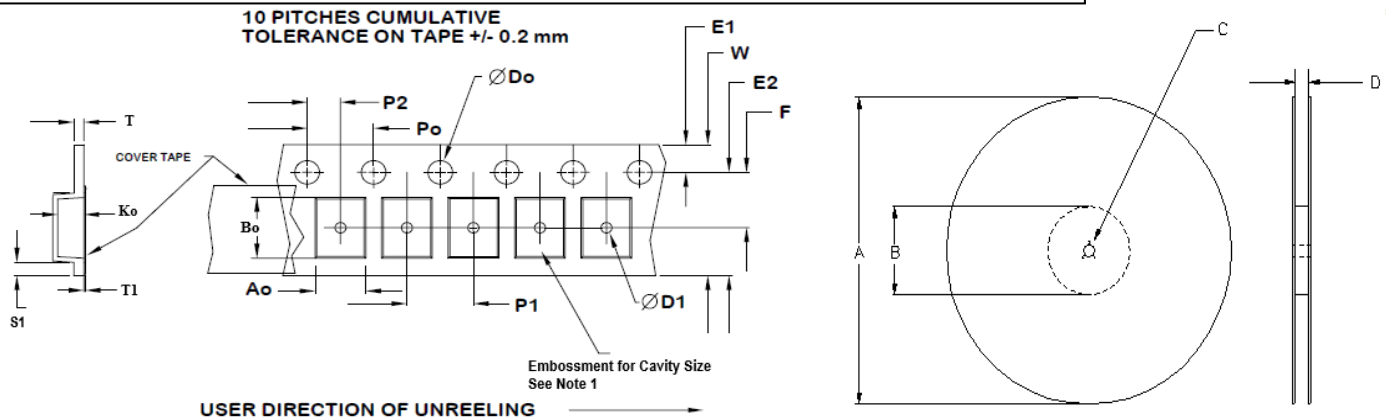


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	($T_{S_{max}}$ 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. 8mm tape, 4mm pitch.



Tape Variable Dimensions Table 2

Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
8mm	6.25	3.5 ±0.05	4.0 ±0.1	8.2	1.9±0.1	2.3±0.1	0.9±0.1

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	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	0.3	0.1

Reel Dimensions (may vary) Table 3

Reel Size	A		B		C	D
	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

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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
URL: www.cardinalxtal.com