PLETRONICS
www.pletronics.com 425-776-1880





TCD4012 Series
TCVCXO Oscillator

March 2009

Preliminary

Lead Free

- Pletronics' TCD4 Series is a temperature compensated voltage controlled crystal oscillator with a clipped sinewave output.
- The package is designed for high density surface mount designs.
- Tape and Reel packaging is available.

- **Ideal Device for Femtocell applications**
- 3.2 x 5 mm LCC Ceramic Package
- Optional Voltage Control Function
- Available frequencies

16.384 MHz	19.2 MHz
16.800 MHz	26.0 MHz

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

Absolute Maximum Ratings:

Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +6.5V
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo 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

Product information is current as of publication date. The product conforms to specifications per the terms of the Pletronics standard warranty. Production processsing does not necessarily include testing of all parameters.

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Part Marking:

***ffff*yww**
PLE*x*YWW

Where: ***yww*** = Date code of the crystal
YWW = Date code of the TCXO assembly
x = Internal code

Frequency (MHz)	*ffff*
16.384	1638
16.8	1680
19.2	1920
26.0	2600

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
(Part number will be: TCD4012-FF.FFM where FF.FF is the frequency in MHz)

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

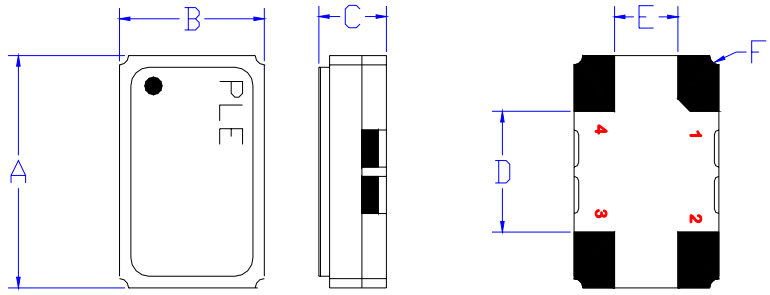
TCD4027050GH015008-12.75M
Customer P/N: 12345678
Qty: 1000 D/C TC512SA

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

Electrical Specification for specified Vcc of 3.30V ±5% over the specified temperature range

Item	Min	Typ	Max	Unit	Condition
Frequency Stability	-0.25 -0.1	0 0	0.25 0.1	ppm	Vcontrol 1.50 volts 0°C to +70°C Vcontrol 1.50 volts +20°C to +60 °C (Reference to midpoint min/max frequency)
Holdover	-0.1	0	+0.1		Over any 5 °C range between 0 and 70°C for 24 hrs Max.
Frequency Calibration	-1.0	0	+1.0	ppm	Vcontrol 1.50 volts and Temperature 25°C
Frequency Slope	-50	0	+50	ppb/°C	Minimum 1 frequency reading every 2°C
Frequency Stability vs Supply	-0.2	0	+0.2	ppm	Load: 10K ohm // 10 pF & Vcc ± 5%
Output Waveform	Clipped Sinewave				DC Coupled
Output Level	0.8		1.2	V p-p	Load: 10K ohm ± 10% // 10 pF ± 10%
Phase Noise 10 Hz 100 Hz 1 KHz 10 KHz	- - - -	-88 -115 -136 -148	- - - -	dBc/Hz	
Supply Current I_{CC}	-	-	2.5	mA	
Aging	-1.0 -5.0	- -	+1.0 +5.0	ppm	for first year at +25°C total for 10 years at +25°C
Frequency Shift after reflow	-1.0	-	+1.0	ppm	measured at 25°C 120 min after reflow
Frequency Pullability	-8.0	-	+8.0	ppm	at Vcontrol 1.50volts ±1.0volt
Operating Temperature Range[1]	-30	-	+85	°C	
Supply Voltage	2.7	3.3	3.5		
Storage Temperature Range	-40	-	+85	°C	

Mechanical:



	Inches	mm
A	0.197 ±0.006	5.00 ±0.15
B	0.126 ±0.006	3.20 ±0.15
C	0.057 ±0.002	1.4 ±0.15
D[1]	0.102	2.60
E[1]	0.055	1.40
F[1]	0.008	0.020R

Not to Scale

[1] Typical dimensions

Contacts :

Gold 11.8 µinches 0.3 µm minimum 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	
4	Supply Voltage (V_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

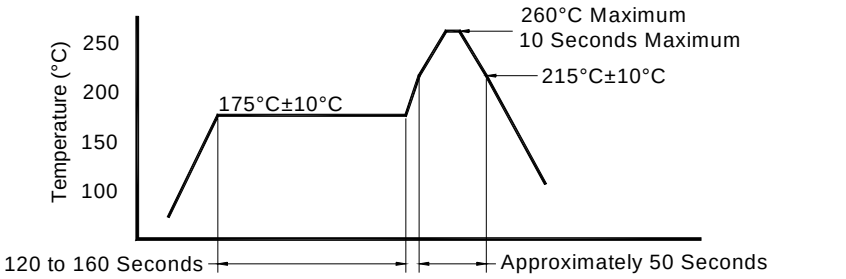
Lead Free

Layout and application information

For Optimum 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.

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

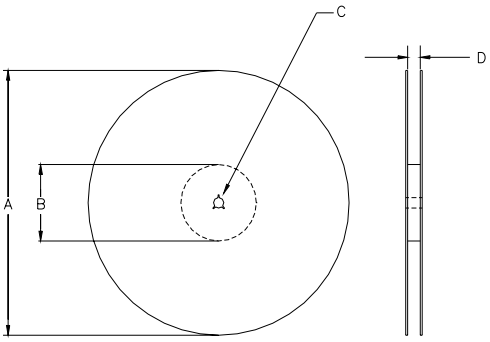
Constant Dimensions Table 1

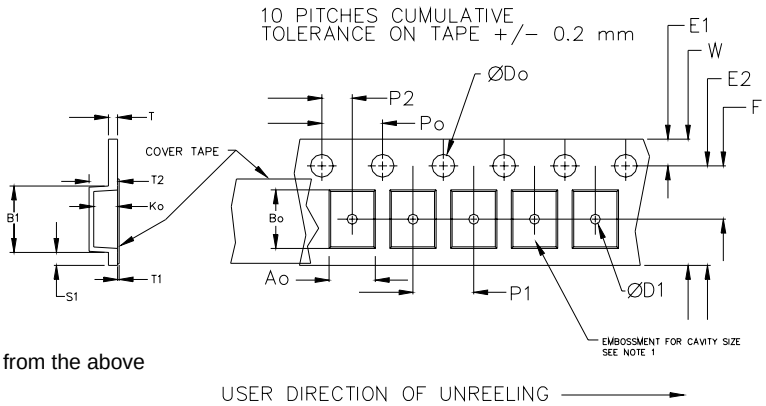
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5						
16mm		1.5			2.0 ±0.1			
24mm		1.5						

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





		REEL DIMENSIONS			
A	inches	7.0	10.0	13.0	
	mm	177.8	254.0	330.2	
B	inches	2.50	4.00	3.75	
	mm	63.5	101.6	95.3	Tape Width
C	mm	13.0 +0.5 / -0.2			
D	mm	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.0

Reel dimensions may vary

from the above

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