PLETRONICS
www.pletronics.com 425-776-1880

TCD4 Series
TCVCXO Oscillator

June 2008

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.
- 10 to 26 MHz
- 3.2 x 5 mm LCC Ceramic Package
- Optional Voltage Control Function

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.

Part Number:

TCD4	027	050	G	H	015	008	-12.75M	-XX	
									Internal code or blank
									Nominal Frequency in MHz
									Pullability in ppm (Vcontrol) **000** = TCXO only **008** = ± 8 ppm minimum **015** = ± 15 ppm minimum
									Stability in ppm **010** = ± 1 ppm **015** = ± 1.5 ppm **025** = ± 2.5 ppm
									Highest Specified Operating Temperature **A** = +40°C **E** = +60°C **J** = +80°C **B** = +45°C **F** = +65°C **K** = +85°C **C** = +50°C **G** = +70°C **D** = +55°C **H** = +75°C
									Lowest Specified Operating Temperature **A** = +10°C **E** = -10°C **J** = -30°C **B** = +5°C **F** = -15°C **K** = -35°C **C** = +0°C **G** = -20°C **L** = -40°C **D** = -5°C **H** = -25°C **M** = -45°C
									Highest Supply Voltage * **055** = 5.5 volts **036** =3.6 volts
									Lowest Supply Voltage * **029** = 2.9 volts **027** = 2.7 volts
									Series (Part Type, Logic & Package)

***** Supply Voltage: Select range between 2.7V and 5.0V with Highest / Lowest ≤ 1.20
For Example: the part number for 3.3V nominal would be TCD4030036.....

Part Marking:

P***fff.fff*** Where: *ymdxx* = Date code
ymdXX P*fff.fff* = Pletronics and frequency in MHz

Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from the marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

See next page for codes for date code

Codes for Date Code YMD

Code	6	7	8	9	0	1	2
Year	2006	2007	2008	2009	2010	2011	2012

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

Electrical Specification for specified Vcc over the specified temperature range

Item	Min	Max	Unit	Condition
Frequency Range	10	26	MHz	
Frequency Accuracy [1]	-2.5	+2.5	ppm	Vcontrol 1.50 volts if used [2]
Frequency Stability / Supply	-0.2	+0.2	ppm	Load: 10K ohm // 10 pF & Vcc ± 5%
Output Waveform	Clipped Sinewave			
Output Level	0.8	1.1	V p-p	Load: 10K ohm ± 10% // 10 pF ± 10%
Phase Noise	-	-135	dBc/Hz	Typical at 1 kHz
V Supply Range [1] V_{CC}	2.7	5.0	Volts	
Supply Current I_{CC}	-	2.0	mA	
Aging	-1.0	+1.0	ppm	Per year
Vcontrol Range	0.5	2.50	Volts	1.50 volts nominal
Frequency Pullability [1]	-15	+15	ppm	
Operating Temperature Range [1]	-45	+85	°C	
Storage Temperature Range	-55	+95	°C	

[1] Specified by part number
[2] For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures

Reliability: Environmental Compliance

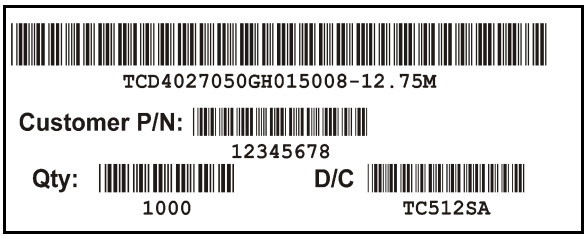
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

ESD Rating

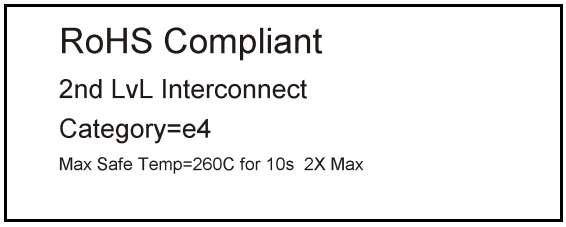
Model	Minimum Voltage	Conditions
Human Body Model	1500	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

Package Labeling

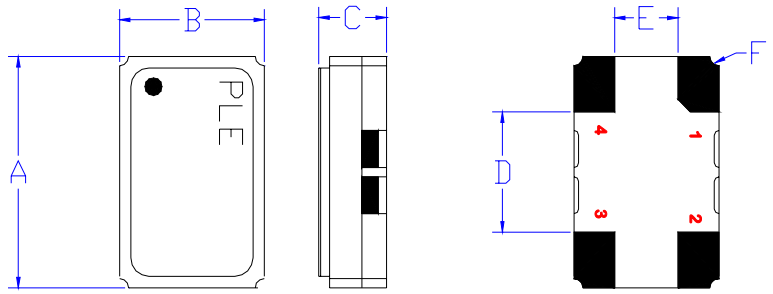
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII



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



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

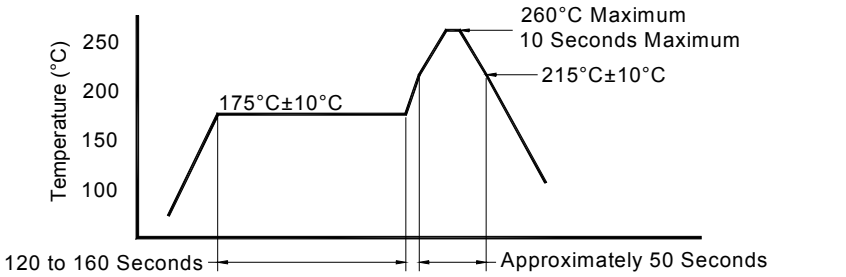
Pad	Function	Note
1	Vcontrol Input	If this function is not specified, recommend connecting this pad to ground.
2	Ground (GND)	
3	Output	
4	Supply Voltage (V_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

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)



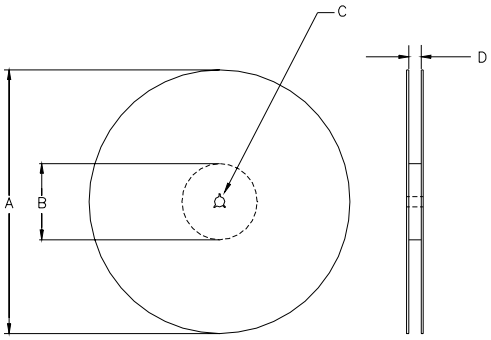
The part may be reflowed 2 times without degradation.

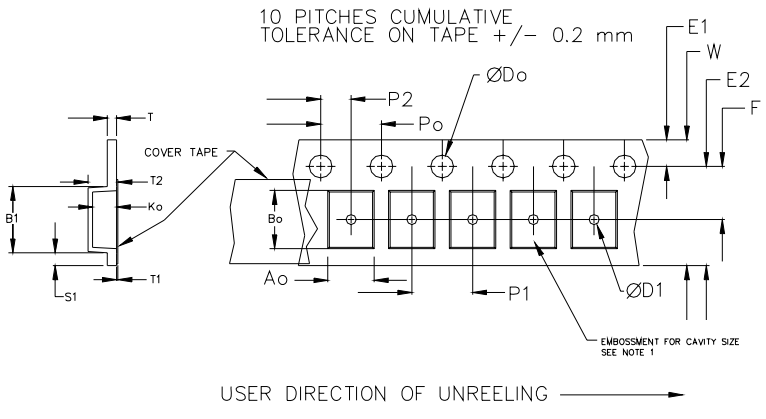
Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

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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