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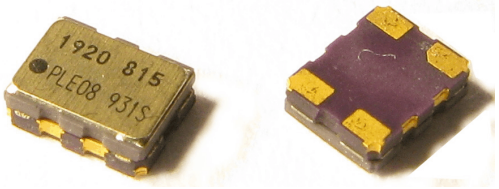


TCE4 Series
TCXO / TCVCXO

May 2012

Lead Free

- Pletronics' TCE4 Series is a temperature compensated crystal oscillator with an optional voltage control function and a clipped sinewave output.
- The package is designed for high density surface mount designs.
- Tape and Reel packaging is available.
- 10 to 52 MHz
- 1.7V to 3.7V
- 2.5 x 3.2 mm LCC Ceramic Package
- Optional Voltage Control Function (TCVCXO)

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: 0.10 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D.1
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 25 to 40°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Part Number:

TCE4	031	035	G	H	015	008	-12.75M	-XX

-XX	Internal code or blank
-12.75M	**Nominal Frequency in MHz**
008	**Pullability in ppm (Vcontrol)** (xxx in ppm) **000** = TCXO only **008** = ± 8 ppm minimum Example
015	**Stability in ppm** (ppm = xxx / 10) Examples are: **010** = ± 1 ppm **015** = ± 1.5 ppm **025** = ± 2.5 ppm
H	**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
G	**Lowest Specified Operating Temperature** **A** = +10°C **E** = -10°C **J** = -30°C **B** = +5°C **F** = -15°C ****L** = -40°C **C** = +0°C **G** = -20°C **D** = -5°C **H** = -25°C
035	**Highest Supply Voltage *** (xxx / 10) **035** = 3.5 volts for 3.3 volts nominal **031** = 3.1 volts for 3.0 volts nominal **026** = 2.6 volts for 2.5 volts nominal
031	**Lowest Supply Voltage** * (xxx / 10) **031** = 3.1 volts for 3.3 volts nominal **029** = 2.9 volts for 3.0 volts nominal **024** = 2.4 volts for 2.5 volts nominal
TCE4	**Series (Part Type, Logic & Package)**

* Supply Voltage: Select range between 2.7V and 3.3V with Highest / Lowest ≤ 1.10
For Example: the part number for 3.3V nominal would be TCE4032034.....

** Contact factory for extended temperature operation and stabilities. Not all stabilities are available @-40°C

Part Marking:

ffff.xxx	or	***ffff:xxx***
•PLEx*x.ywwx*		**• PLE *x.ywwx***

ffff.xxx	=	frequency in MHz .
PLE	=	Pletronics
x	=	Internal code
yww	=	Year week

Electrical Specification for specified Vsupply with a variation of ±5% over the specified temperature range

Item	Min	Typ	Max	Unit	Condition
Frequency Range	10	-	52	MHz	
Frequency Accuracy Range [1]	-2.5 -0.5	-	+2.5 +0.5	ppm	Vcontrol 1.50 volts if used
Frequency setting	-2	0	+2	ppm	Vcontrol 1.50 volts at 25ºC
Frequency Stability vs. Supply	-0.2	0	+0.2	ppm	Load: 10K ohm // 10 pF & Vcc ± 5%
Frequency Stability vs. Load	-0.2	0	+0.2	ppm	Load: 10K ohm // 10 pF ± 5%
Output Waveform	Clipped Sinewave				
Output Level	0.8	-	1.1	V p-p	Load: 10K ohm ± 10% // 10 pF ± 10%
Phase Noise 100 Hz 1 KHz 10 KHz 100 KHz	- - - -	-115 -136 -145 -145	- - - -	dBc/Hz	
V Supply Range V_{CC}	1.7	-	3.7	Volts	
Supply Current I_{CC}	-	2.0	3.0	mA	
Aging	-1.0	-	+1.0	ppm	Per year at 25ºC
Vcontrol Range	0.5	-	2.50	Volts	1.50 volts nominal
Frequency Pullability [1]	-5	±3	+5	ppm	
Operating Temperature Range	-30		+85	ºC	
Storage Temperature Range	-55		+95	ºC	

[1] Specified by part number

Reliability: Environmental Compliance

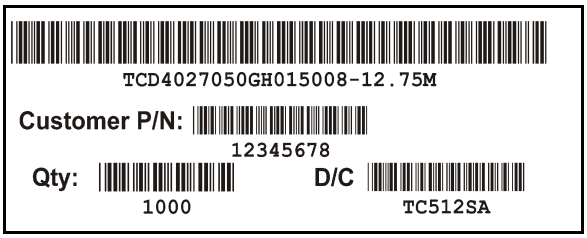
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

ESD Rating

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

Package Labeling

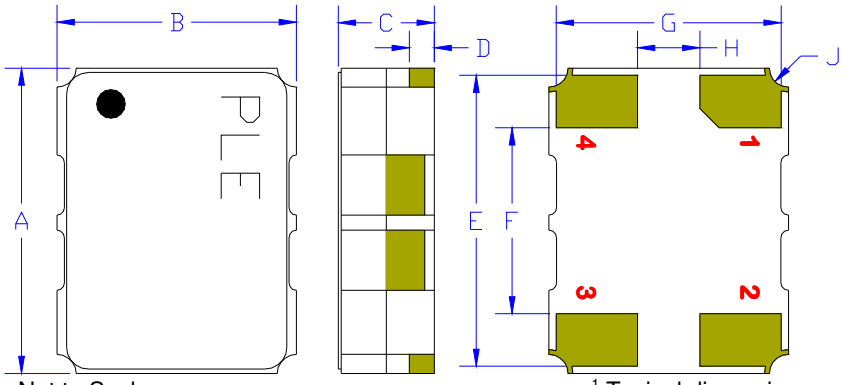
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII
(the label will show the TCE4 actual part number)



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

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

Mechanical:



Not to Scale

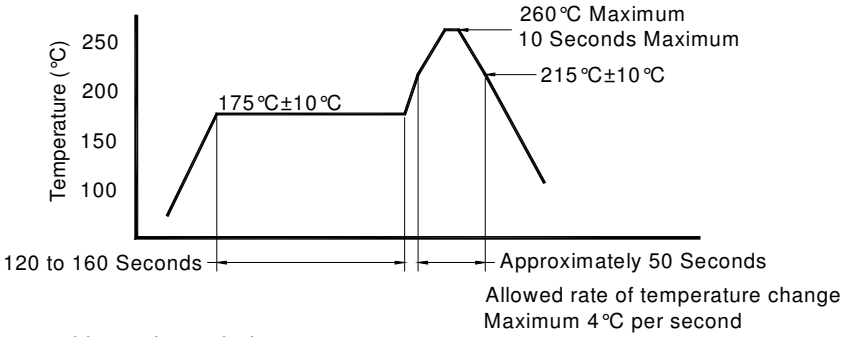
[1] Typical dimensions

	Inches	mm
A	0.126 ±0.008	3.20 ±0.20
B	0.098 ±0.008	2.50 ±0.20
C	0.040 max	1.0 max
D[1]	0.102	0.26
E[1]	0.120	3.05
F[1]	0.077	1.95
G[1]	0.093	2.35
H[1]	0.026	0.65
J[1]	0.008	0.20R

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.

Reflow Cycle (typical for lead free processing)

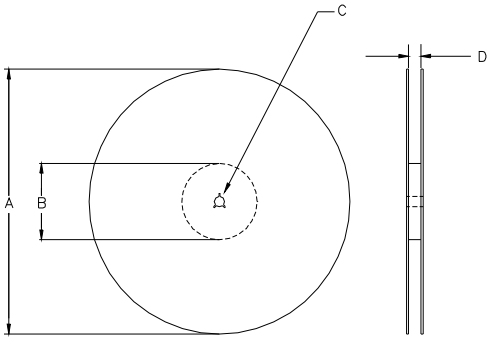


The part may be reflowed 2 times without degradation.

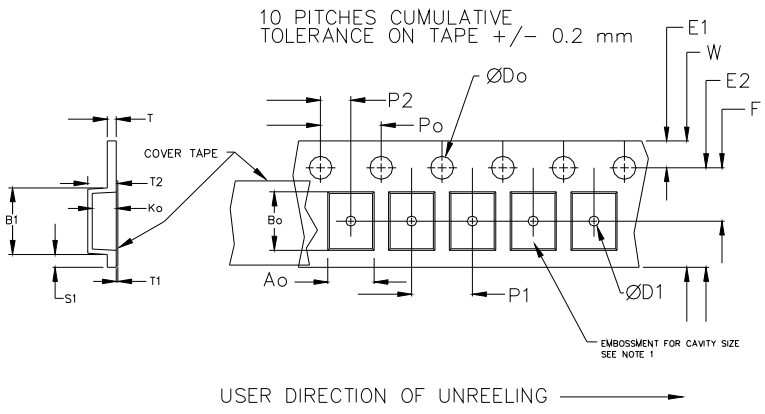
Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

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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