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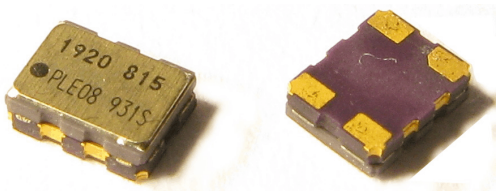

TCE4 Series
TCXO / TCVCXO

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.

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 Number:

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

Internal code or blank

Nominal Frequency in MHz

Pullability in ppm (Vcontrol) (xxx in ppm)
000 = TCXO only
008 = ± 8 ppm minimum Example

Stability in ppm (ppm = xxx / 10) Examples are:
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 ****L** = -40°C
C = +0°C **G** = -20°C
D = -5°C **H** = -25°C

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

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

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 •PLEx x.ywwx	or	ffff:xxx • 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

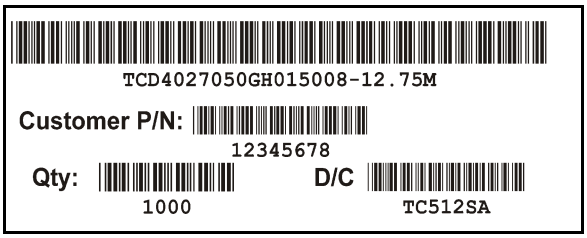
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

ESD Rating

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

Package Labeling

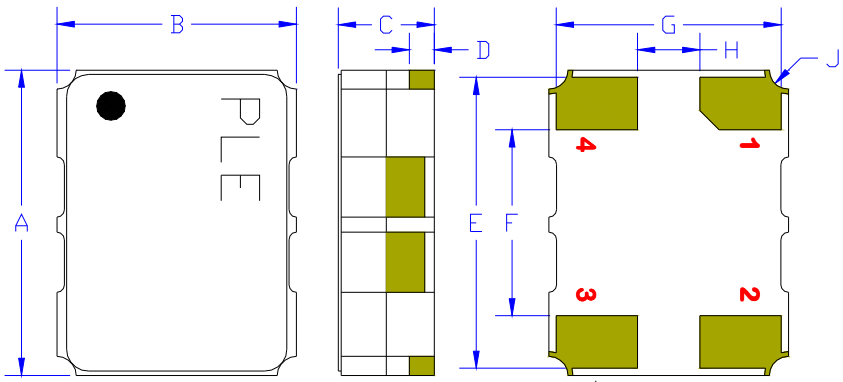
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII
(the label will show the TCE4 actual part number)



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

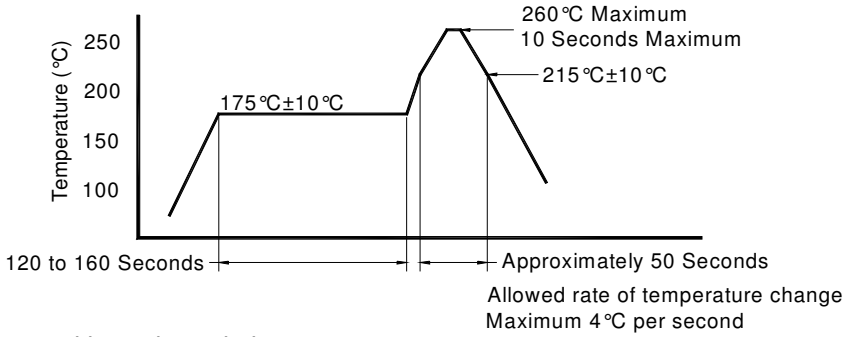
[1] Typical dimensions

	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)

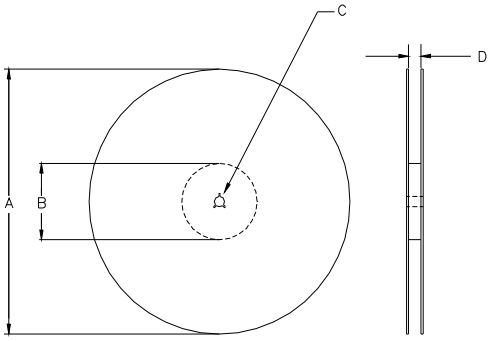


The part may be reflowed 2 times without degradation.

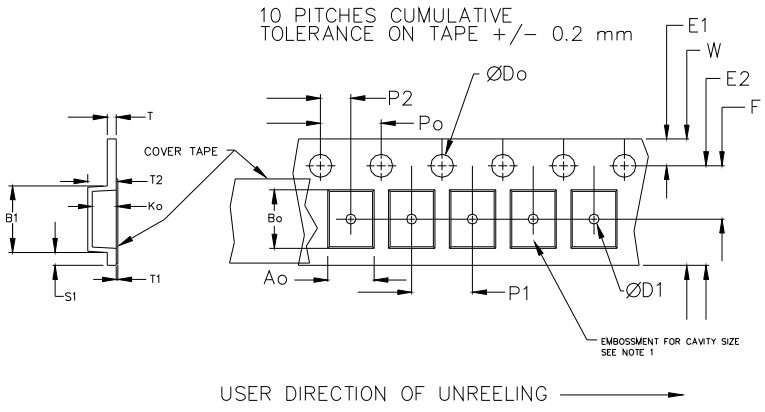
Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

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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http://moschip.ru/get-element

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