



THM1 Series TCXO

May 2005



- Pletronics' Temperature Compensated quartz crystal controlled precision square wave generator with a CMOS output.
- Greatly reduces RFI and EMI system sensitivity
- Minimizes RFI radiation, eases meeting FCC Class B emissions standards.
- Tube packaging.
- 10 to 40 MHz
- Full Size Thru-Hole DIP package

Pletronics Inc. certifies this device is in accordance with the RoHS (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: 4.0 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020C
Second Level Interconnect code: e1 or e2

Absolute Maximum Ratings:

Parameter	Unit
V _{CC} Supply Voltage	-0.5V to +5.5V
V _o 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 120°C/Watt depends on the solder pads, ground plane and construction of the PCB.

Part Number:

THM1	031	035	L	K	044	-20.0M	-XX	Marking
Internal code or blank								
Frequency in MHz								<i>fff.fff</i> M
Maximum F error from nominal 4.4ppm								
Highest Specified Temperature +85°C								K
Lowest Specified Temperature -40°C								L
Highest Vcc 3.50V								
Lowest Vcc 3.10V								3
Series Model								TH

Part Marking:

PLE
TH3LK44
20.00M
yywwaLF

Where:

yywwa = Date code
LF = Lead Free

Electrical Specification for 3.30V $\pm 5\%$ over the specified temperature range

Item	Value	Unit	Condition
Frequency	20.000	MHz	
Frequency Stability	± 4.4	ppm	for all specified temperature, supply and load variations
Long Term Frequency Stability	± 8.0	ppm	change in frequency for 15 years
Output Waveform	CMOS		
Output High Level	90 min	%	of V_{CC} (See load circuit) $C_{LOAD} = 15pF \pm 5\%$
Output Low Level	10 max	%	of V_{CC} (See load circuit) $C_{LOAD} = 15pF \pm 5\%$
Output Symmetry	40 to 60	%	at 50% point of V_{CC} $C_{LOAD} = 15pF \pm 5\%$
Output Rise and Fall Time	5.0 max	nS	at 10% to 90% point of V_{CC} $C_{LOAD} = 15pF \pm 5\%$
Phase Noise at Frequency Offset		dBc/Hz	
1Hz	-60		
10Hz	-90		
100Hz	-120		
1KHz	-130		
10KHz	-135		
100KHz	-140		
Supply Current I_{CC}	20 max	mA	(See load circuit) $C_{LOAD} = 15pF \pm 5\%$
Operating Temperature Range	-40 to +85	$^{\circ}C$	
Storage Temperature Range	-55 to +125	$^{\circ}C$	

PCB Mounting (typical for lead free processing)

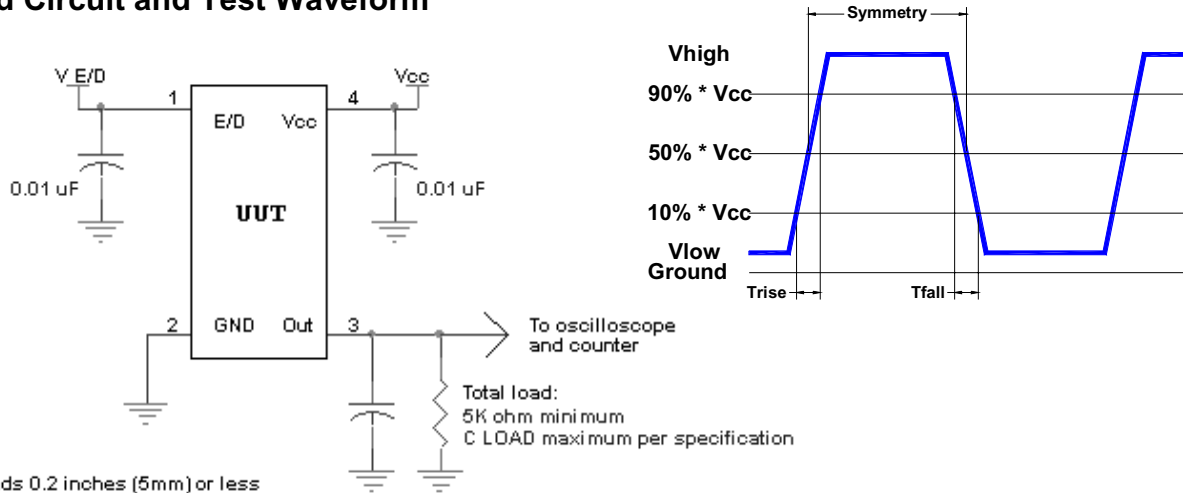
Wave solder at 255 $^{\circ}C$ to 280 $^{\circ}C$

Maximum wave exposure of 15 seconds

Soldering done in a nitrogen atmosphere enhances the solder joint quality.

Hand soldering is recommended.

Load Circuit and Test Waveform



Reliability: Environmental Compliance

Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition A
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

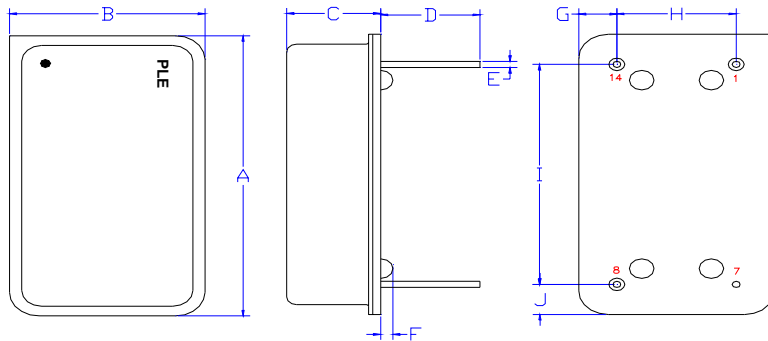
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

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

T.B.D.

Pb Free
2nd Lvl Interconnect
Category=e1 or e2
Max Safe Temp=280C for 15s

Mechanical:



Cover:
Kovar
Electroless Nickel Plated
1 µinch (25 µm) typical
Resistance welded to base

Base:
Kovar
Glass to metal sealed leads

Label:
White Kapton with Black Letters
—or—
Blue Epoxy heat cure ink with laser
marked lettering

Pin 7 Connected to case

Not to scale

	Inches	mm
A	0.887 ±0.005	22.53 ±0.13
B	0.487 ±0.005	12.37 ±0.13
C	0.400 max	10.16 max
D ¹	0.150 min	3.81 min
E ¹	0.020	0.51
F ¹	0.031	0.79
G ¹	0.094	2.37
H ¹	0.300	7.62
I ¹	0.600	15.24
J ¹	0.094	2.37

¹ Nominal dimension

Pad	Function	Note
1	n.c.	No internal electrical connection
7	Ground (GND)	
8	Output	
14	Supply Voltage (V _{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

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.



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