



- Pletronics' THD3003-38.88M is a temperature compensated crystal oscillator
- Optional Voltage Control Function
- HCMOS output.
- The package is designed for high density surface mount designs.
- Tape and Reel packaging is available.
- Select Stratum-III frequencies available
- 3.2 x 5 mm LCC Ceramic Package
- Tape and Reel packaging is available.
- Select Stratum-III frequencies available

**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 <sub>CC</sub> Supply Voltage	-0.5V to +6.5V
V <sub>i</sub> Input Voltage	-0.5V to V <sub>CC</sub> + 0.5V
V <sub>o</sub> Output Voltage	-0.5V to V <sub>CC</sub> + 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.

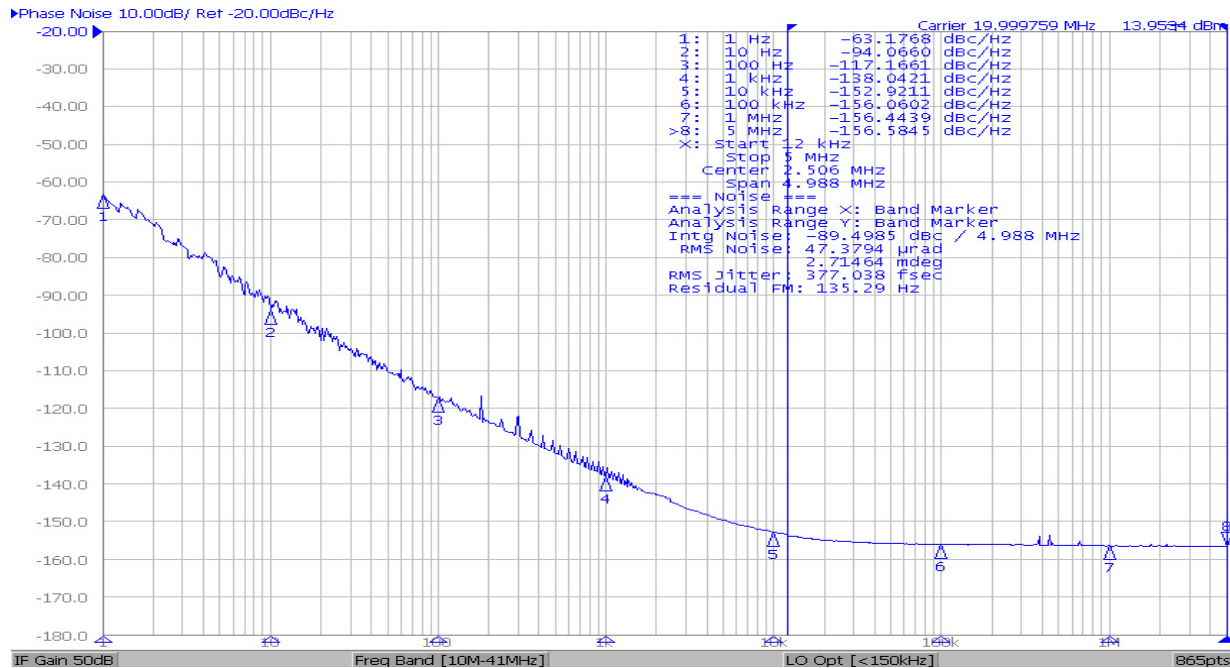
### ESD Rating

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

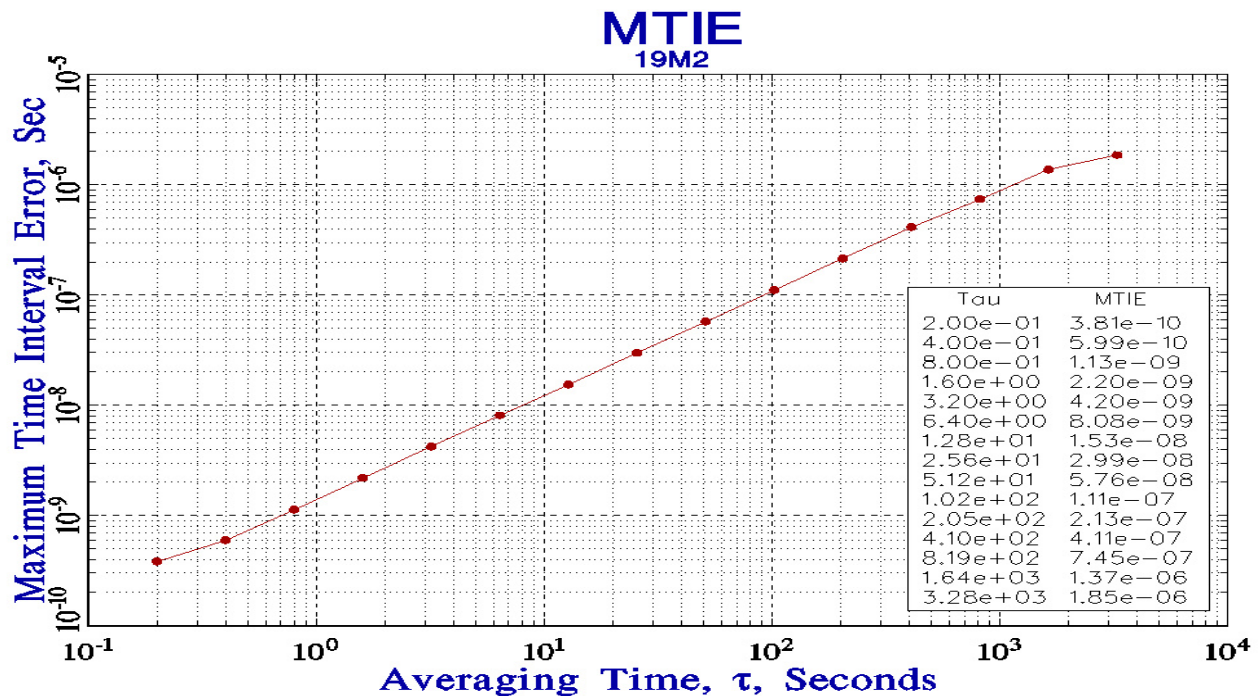
## Electrical Specification for specified Vcc over the specified temperature range

Item	Min	TYP	Max	Unit	Condition
Frequency Range		38.88		MHz	
Frequency Stability vs Temp.	-0.28		+0.28	ppm	Vcontrol = 1.50 volts (Fmax-Fmin)/2
24 Hour Holdover	-0.37		0.37	ppm	GR-1244-CORE
Frequency Calibration	-0.5		+0.5	ppm	Frequency offset at 25°C, 60 minutes after reflow
Frequency Stability / Supply	-0.10		+0.10	ppm	Load: 10K ohm // 10 pF & Vcc ± 5%
Load Sensitivity	-0.20		+0.20	ppm	±2% variation in magnitude from 10K ohm ±10%    10 pF
Long Term Stability (Aging)	-3.4		+3.4	ppm	After 15 years.
Output Waveform	CMOS				
Output V <sub>HIGH</sub> as % of Supply	90			%V <sub>S</sub>	Load: 10K ohm ± 10% // 10 pF
Output V <sub>LOW</sub> as % of Supply			10	%V <sub>S</sub>	
T <sub>RISE</sub> and T <sub>FALL</sub> (10% to 90%)			6.5	nS	
Duty Cycle at 50% Supply	40	50	60	%	
Phase Noise	10 Hz 100 Hz 1 kHz 10 kHz	- -90 -115 -135 -145	- - - -	dBc/Hz	Typical values for a 20.0 MHz oscillator at 25°C
Jitter	-	-	1.7	pS	10 Hz to 1 MHz offset from carrier
V Supply Range V <sub>CC</sub>	2.8	-	5.5	Volts	
Supply Current I <sub>CC</sub>	-	-	7.0	mA	
Vcontrol Range	0.5		2.50	Volts	1.50 volts nominal
Frequency Pullability	± 9.2	± 10.0	-	ppm	
Linearity	-	0.05	2.0	%	In accordance with MIL-PRF-55310
Operating Temperature Range	-40		+85	°C	Specified by part number
Storage Temperature Range	-55		+95	°C	

**Phase Noise:**







**MTIE:**



## 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

P/N:   
THD3003-38.80M  
Customer P/N:   
12345678  
Qty:  1000 D/C   
MSL: 1 TC512SA

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

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

## Part Marking:

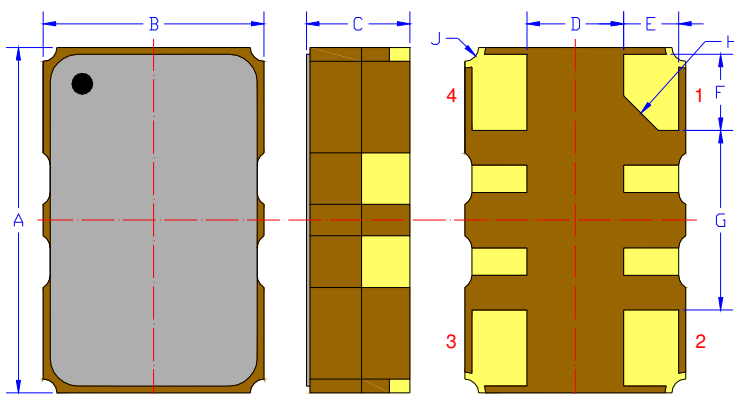
**ffff.yww**  
• PLExx.xxxx

or

**ffff.yww**  
• PLExx.xxxx

ffff.yww = frequency in MHz . Year week  
PLE = Pletronics  
xx.xxxx = internal code

## Mechanical:



	Inches	mm
A	0.197 $\pm$ 0.008	5.00 $\pm$ 0.20
B	0.126 $\pm$ 0.008	3.20 $\pm$ 0.20
C	0.059 max	1.50 max
D <sup>1</sup>	0.055	1.40
E <sup>1</sup>	0.031	0.80
F <sup>1</sup>	0.043	1.10
G <sup>1</sup>	0.102	2.60
H <sup>1</sup>	0.013C	0.50C
J <sup>1</sup>	0.008	0.20R

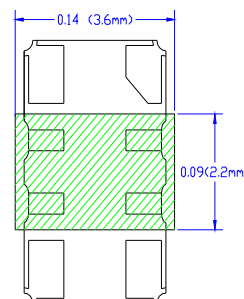
Pad	Function	Note
1	Vcontrol Input	If this function is not specified, recommend connecting this pad to ground.
2	Ground (GND)	
3	Output	
4	Supply Voltage (V <sub>cc</sub> )	Connect an appropriate power supply bypass capacitors as close as possible.
-	N. C.	All other pads on the bottom shall not be connected. These are internally connected and were for the TCXO compensation process

## Layout and application information

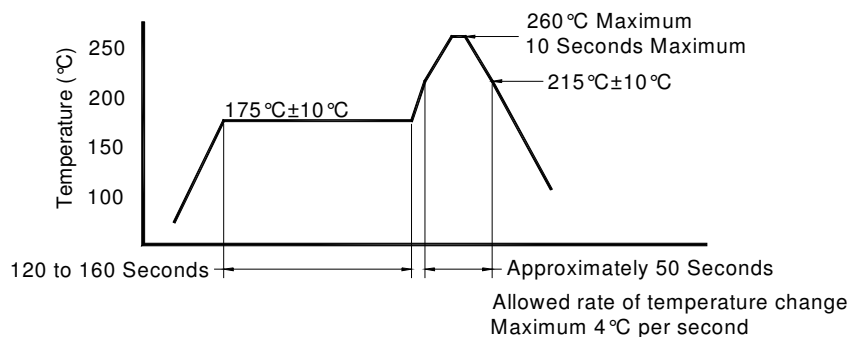
All connection points in the designated region have solder mask cover to avoid any electrical connections

For Optimum Stability and 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.
- minimize air flow across the device



## 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

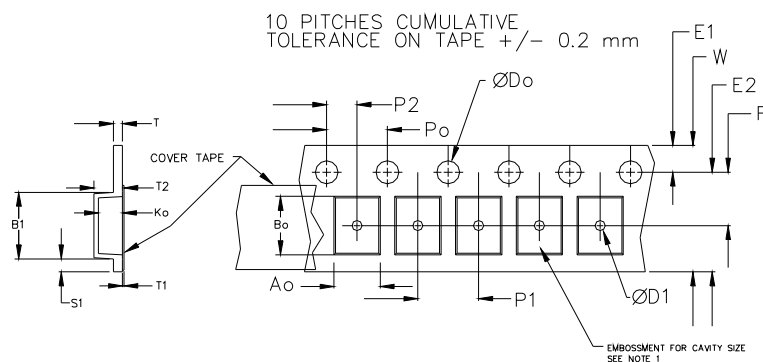
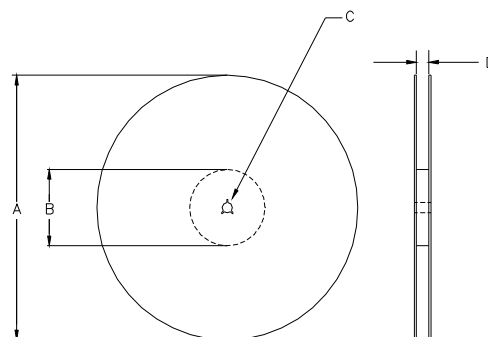
Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5	1.0	1.75	4.0	2.0 ± 0.05	0.6	0.6	0.1
12mm		1.5			2.0 ± 0.1			
16mm		1.5			2.0 ± 0.1			
24mm		1.5			2.0 ± 0.1			

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 scale

Dimensions in mm

Not to



USER DIRECTION OF UNREELING →

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
C	mm	13.0 +0.5 / -0.2		
D	mm	16.4	16.4	16.4
		+2.0 -0.0	+2.0 -0.0	+2.0 -0.0

Reel dimensions may vary from the above

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