



SM77T003-36.864M CMOS Clock Oscillator

March 2013

- Pletronics' SM77T003-36.864M is a quartz crystal controlled precision square wave generator with a CMOS output.
- Built with the PLE SM77H series of 5x7 mm CMOS oscillators
- Tube packaging is available.
- Full Size Thru-Hole DIP package
- Enable/Disable Function
- Disable function includes low standby power mode
- Low Jitter
- Internal V_{CC} bypass capacitor

ENHANCED VERSION TO MEET THE REQUIREMENT OF A LEGACY PRODUCT

Pletronics will continue to support this P11 footprint but will utilize the SM77 device technology. The P11 will now be a hermetic sealed metal package with an unchanged appearance but will have an SM77xxH series ceramic LCC oscillator inside.



**Pletronics Inc. certifies this device is in accordance with the
RoHS (2011/65/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: 2.0 grams

Moisture Sensitivity Level: 1 As defined in J-STD-020C

Second Level Interconnect code: e1 or e2

Absolute Maximum Ratings:

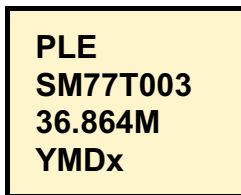
Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +7.0V
V_i Input Voltage	-0.5V to $V_{CC} + 0.5V$
V_o Output Voltage	-0.5V to $V_{CC} + 0.5V$

Thermal Characteristics

The maximum die or junction temperature is 155°C

The thermal resistance junction to board is 110°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Part Marking:

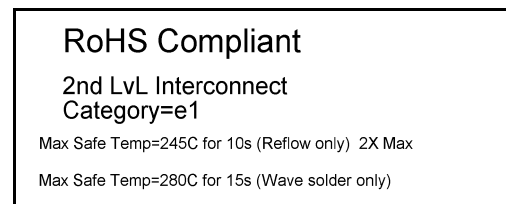


<i>PLE</i>	=	Pletronics
<i>SM77T003</i>	=	Model
<i>36.864M</i>	=	Frequency in MHz of the SM77
<i>YMD</i>	=	Year, Month, and Day
<i>X</i>	=	Internal factory code

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



PCB Mounting (typical for lead free processing)

Hand soldering is recommended.

Wave solder at 255°C to 280°C with maximum wave exposure of 15 seconds

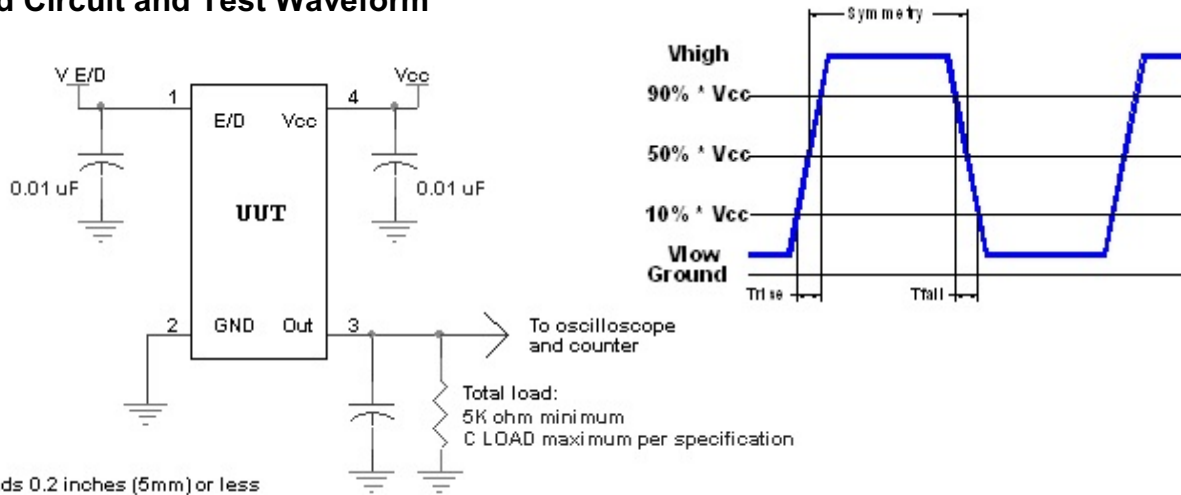
Reflow solder maximum exposure of 245°C for 15 seconds

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

Electrical Specification 36.864M, 3.30V $\pm 10\%$ over the specified temperature range

Item	Min	Max	Unit	Condition
Frequency Accuracy	-25	+25	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
Output Waveform	CMOS			
Output High Level	90	-	%	of V_{CC} (See load circuit)
Output Low Level	-	10	%	
Output Symmetry	45	55	%	at 50% point of V_{CC} (See load circuit)
Enable/Disable Internal Pullup	50	-	Kohm	to V_{CC}
V disable	-	30	%	of V_{CC} applied to pin 1
V enable	70	-	%	
Output leakage $V_{OUT} = V_{CC}$	-10	+10	μA	Pin 1 low, device disabled
$V_{OUT} = 0V$	-10	+10	μA	
Standby Current I_{CC}	-	3	μA	
Enable time	-	100	nS	Time for output to reach a logic state
Disable time	-	100	nS	Time for output to reach a high Z state
Start up time	-	3	mS	Time for output to reach specified frequency
Operating Temperature Range	-40	+85	$^{\circ}C$	Standard Temperature Range
Storage Temperature Range	-55	+125	$^{\circ}C$	
Output T_{RISE} and T_{FALL}	-	5	nS	$C_{LOAD} = 15$ pF 10% to 90% of V_{CC} See Load Circuit
	-	8	nS	$C_{LOAD} = 30$ pF 10% to 90% of V_{CC} See Load Circuit
V_{CC} Supply Current (I_{CC})	-	17	mA	$C_{LOAD} = 15$ pF

Load Circuit and Test Waveform



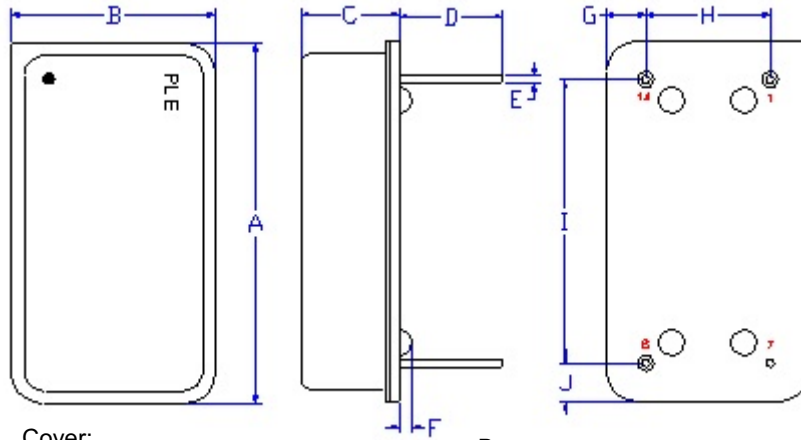
Reliability: Environmental Compliance

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

Mechanical:



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

Base:
Kovar
Glass to metal sealed leads

Pin 7 Connected to case

Marking:
Laser marked lettering

Not to scale

	Inches	mm
A	0.787 \pm 0.005	20.00 \pm 0.13
B	0.487 \pm 0.005	12.37 \pm 0.13
C	0.225 \pm 0.011	5.72 \pm 0.28
D ¹	0.250	6.35
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

Pin	Function	Note
1	Output Enable/Disable	When this pin is not connected the oscillator shall operate. When this pin is logic low the output will be inhibited (high impedance state.) Recommend connecting this pad to V _{CC} if the oscillator is to be always on.
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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