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Temperature Compensated Crystal Oscillators TCXO, M53T Series, CMOS Output

MERCURY
Since 1973

Features:
- ♦ 5x3.2x2.2 mm ceramic SMD TCXOs with CMOS square wave output
- ♦ 0.01 uF decoupling capacitor built-in
- ♦ Wide frequency range: 1.0 MHz to 200.0 MHz
- ♦ Ideal for cellular phone, GPS.

RoHS Compliant Product by Mercury

General Specifications (at+25°C and specified input voltage

Product Series		**M53T**					
Frequency Range		1.0 MHz ~ 200.0 MHz NOTE: 32.768 KHz is also available					
Output Wave From		**Square** wave. Wave form code is "**T**"					
Initial Calibration Tolerance (1)		±2 ppm at +25°C±2°c and Vcon = +1.5 V D.C.					
Standard Frequencies (partial list)		10.0, 12.8, 13.0, 14.4, 16.0, 16.384, 19.2, 19.440, 19.680, 20.0, 38.880 , 77.760 , 155.520 MHz ↓					
Frequency Stability (ppm)		±0.5 pppm	± 1 ppm	±1.5 ppm	±2.0 ppm	±2.5 ppm	√: Available □: Call us ✕: Not available
Temperature Range	**0 to +50°C**	√	√	√	√	√	
	-10 to +60°C	□	√	√	√	√	
	-20 to +70°C	✕	√	√	√	√	
Standard →	**-30 to +75°C**	✕	√	√	√	√	
	-40 to +85°C	✕	√	√	√	√	
Frequency Stability vs Aging		±1.0 ppm max. first year at +25°C					
vs Voltage Change		±2 ppm max. for a ±10% input voltage change					
vs Load Change		±0.3 ppm max. for a ±10% loading condition change					
vs Reflow		±1 ppm max. 1 reflow and measured 24 hours afterwards					
Supply Voltage (V_{DD})		**+2.8 V** (voltage code is "**28**")	**+3.0 V** (voltage code is "**3**")	**+3.3 V** (voltage code is "**33**")			
Current Consumption (typical)		2 mA @ 8.192MHz; 4 mA @ 10 MHz; 17 mA @77.760 MHz; 35 mA @ 155.520 MHz					
Output Voltage Level	**Logic "1"**	**90% V_{DD}** min.					
	Logic "0"	**10% V_{DD}** max.					
Rise Time and Fall Time		1.5 ns typical; 2.0 nano.max. 10% ↔ 90% of V_{DD}					
Duty Cycle (Symmetry)		50%±10% measured at 50% V_{DD}					
Start-up Time		5 ms typical; 10 m. sec. max.					
Output Load		15 pF					
SSB Phase Noise at +25°C	**Offset**	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	
	M53T33-100.000	-72 dBc/Hz	-110 dBc/Hz	-125 dBc/Hz	-132 dBc/Hz	-125 dBc/Hz	

MERCURY www.mercury-crystal.com
Taiwan: TEL (886)-2-2406-2779, FAX (886)-2-2496-0769, e-mail: sales-tw@mercury-crystal.com
U.S.A.: TEL (1)-909-466-0427, FAX (1)-909-466-0762, e-mail: sales-us@mercury-crystal.com

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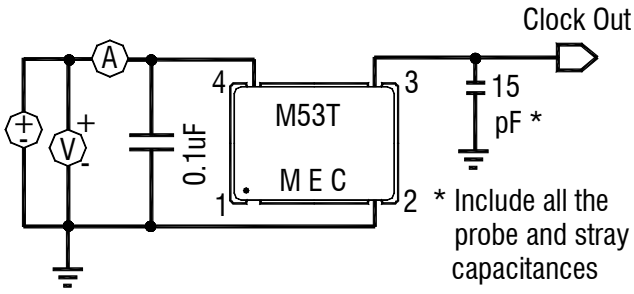
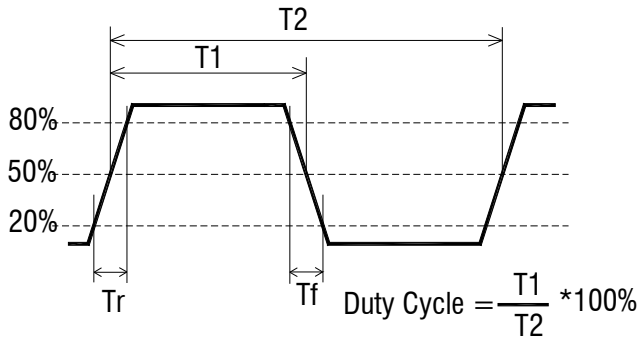
Part Number Format and Example:

Part number example:	M53T3-20.000-2.5/-30+75						✍= Please specify	
	✍		✍		✍		✍	
M53T	3	—	**20.000**	—	**2.5**	/	**-30+75**	
①	②		③		④		⑤	

①: Product Series. Use "M53T" for TCXO product. ②: Voltage code; Use"**28**" for +2.8 V; use "**3**" for +3.0 V; use "**33**" for +3.3 V; ③: Frequency in MHz ④: Frequency stability in ppm ⑤: Operating Temperature range in °C

CMOS Square Wave TCXO Test Circuit and Output Wave Form:





Environment Performance Specifications

Green Requirement	RoHS compliant, Pb (lead) free
MSL Level	MSL 1 per IPC/JEDEC-STD-020C
Humidity	85% RH, 85°C, 48 hours. Crystal part only.
Hermeticity	Leak rate $2x10^{-8}$ ATM-cm^3/sec max. Crystal part only.
Solderability	MIL-STD-202F method 208E
Vibration	MIL-STD-202F method 204, 35G, 50 to 2000 Hz
Shock	MIL-STD-202F method 213B, test condi. E, 1000GG ½ sine wave
Storage temp. range	-55 to +125°C

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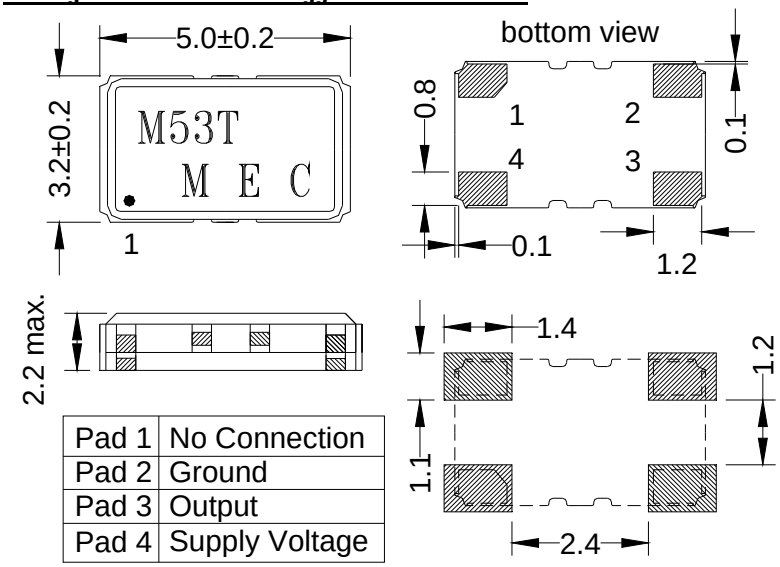
Package Dimensions and Suggested Land Pattern: Unit: mm

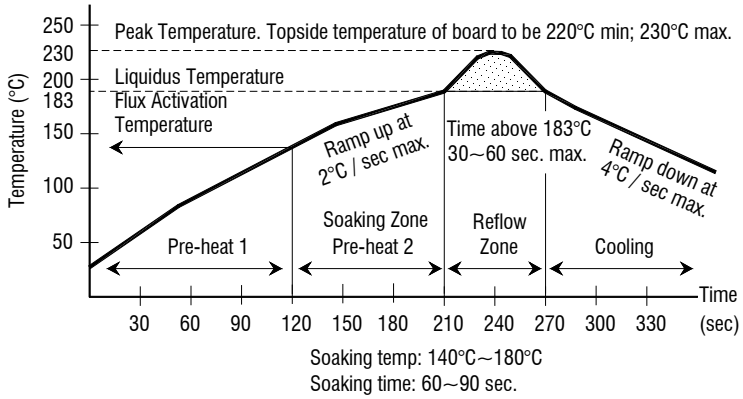


Pad 1	No Connection
Pad 2	Ground
Pad 3	Output
Pad 4	Supply Voltage

Recommended Solder Reflow Profiles

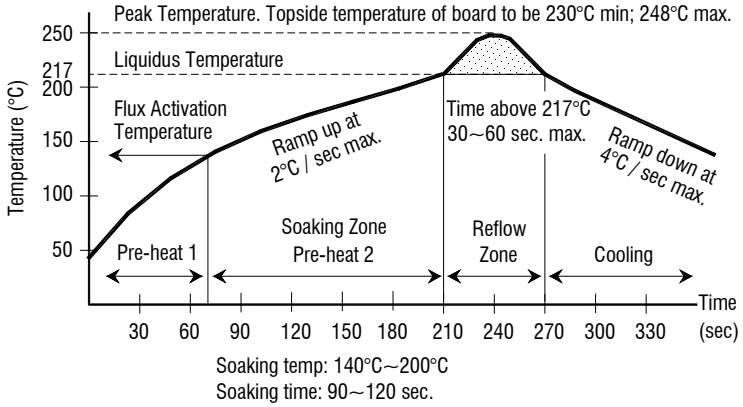
240°C liquidus 235°C solidus temperature alloy is used in the assembly of M53T products.
Do not exceed the reflow conditions given below.

Profile A (low temperature solder reflow): For Sn62 Pb36 Ag2 and Sn63 Pb37 alloy.



Soaking temp: 140°C~180°C
Soaking time: 60~90 sec.

Profile B (high temperature solder reflow): For Sn96.5% Ag 3.5% Cu 0.5% alloy.



Soaking temp: 140°C~200°C
Soaking time: 90~120 sec.

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