

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.



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 Form		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 ppm	± 1 ppm	±1.5 ppm	±2.0 ppm	±2.5 ppm
Temperature Range	0 to +50°C	√	√	√	√	√
	-10 to +60°C	□	√	√	√	√
	-20 to +70°C	✗	√	√	√	√
	-30 to +75°C	✗	√	√	√	√
Standard →	-40 to +85°C	✗	√	√	√	√
Frequency Stability vs Aging vs Voltage Change vs Load Change vs Reflow		±1.0 ppm max. first year at +25°C ±2 ppm max. for a ±10% input voltage change ±0.3 ppm max. for a ±10% loading condition change ±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

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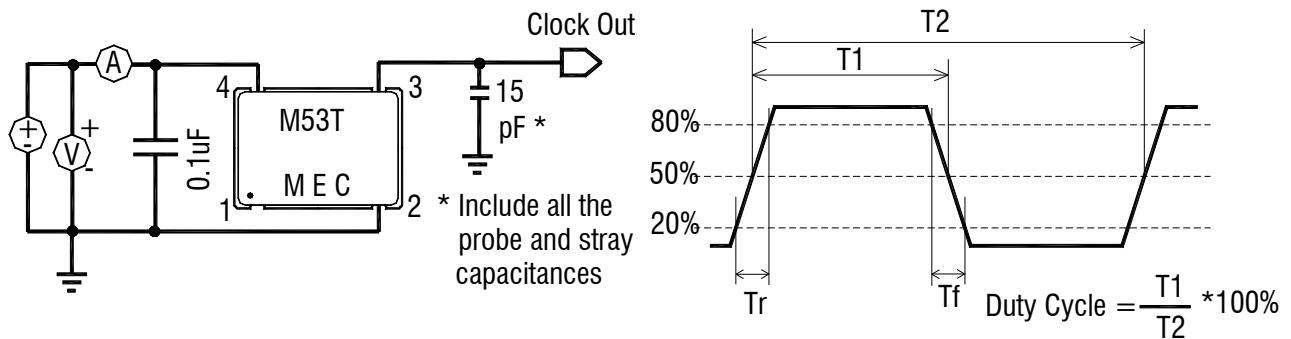
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Part Number Format and Example:

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

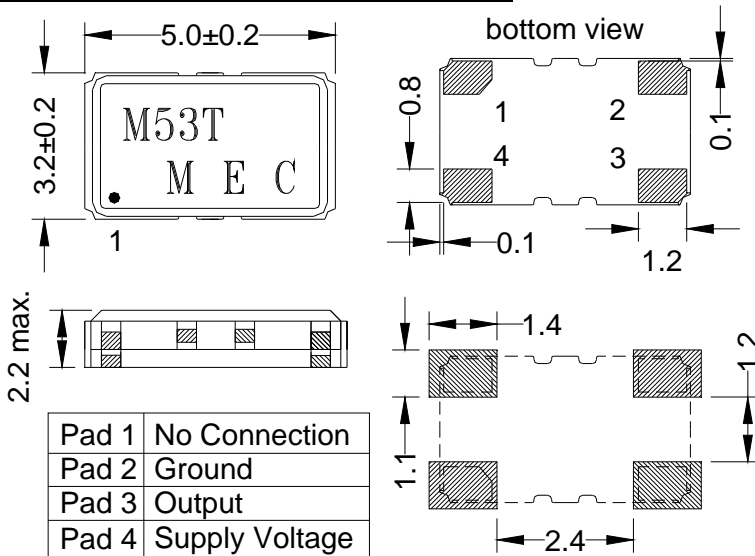
Green Requirement	RoHS compliant, Pb (lead) free
MSL Level	MSL 1 per IPC/JEDEC-STD-020C
Humidity	85% RH, 85°C, 48 hours. Crystal part only.
Hermeticity	Leak rate 2×10^{-8} ATM-cm ³ /sec max. Crystal part only.
Solderability	MIL-STD-202F method 208E
Vibration	MIL-STD-202F method 204, 35G, 50 to 2000 Hz
Shock	MIL-STD-202F method 213B, test condi. E, 1000GG 1/2 sine wave
Storage temp. range	-55 to +125°C

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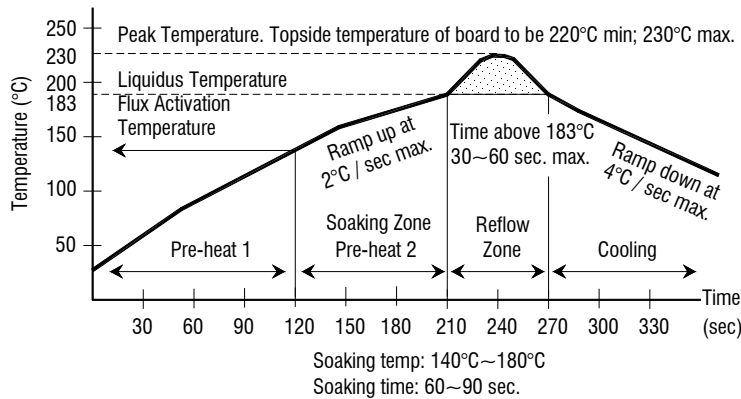
Package Dimensions and Suggested Land Pattern: Unit: mm



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.



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

