

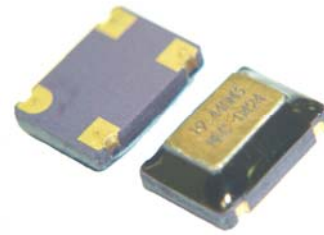
Temperature Compensated Crystal Oscillators TCXO, M57T Series, CMOS Output



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Since 1973

Features:

- ◆ 5x7x2.5 mm ceramic SMD TCXOs with CMOS square wave output
- ◆ 0.01 uF decoupling capacitor built-in
- ◆ Wide frequency range: 1.0 MHz to 156.0 MHz
- ◆ Frequency stability as tight as ± 0.5 ppm over 0°C to $+50^{\circ}\text{C}$ or ± 1 ppm over -40 to $+85^{\circ}\text{C}$



General Specifications (at $+25^{\circ}\text{C}$ and specified input voltage)

Product Series		M57T						
Frequency Range		1.0 MHz ~ 156.0 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 $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and $V_{\text{con}} = +1.5$ 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	✓: Available □: Call us ✗: N/A (Not available)	
Temperature Range	0 to $+50^{\circ}\text{C}$	✓	✓	✓	✓	✓		
	-10 to $+60^{\circ}\text{C}$	□	✓	✓	✓	✓		
	-20 to $+70^{\circ}\text{C}$	✗	✓	✓	✓	✓		
	-30 to $+75^{\circ}\text{C}$	✗	✓	✓	✓	✓		
Standard →	-40 to $+85^{\circ}\text{C}$	✗	✓	✓	✓	✓		
Frequency Stability vs Aging vs Voltage Change vs Load Change vs Reflow		± 1.0 ppm max. first year at $+25^{\circ}\text{C}$ ± 0.3 ppm max. for a $\pm 5\%$ input voltage change ± 0.3 ppm max. for a $\pm 10\%$ 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")		+5.0 V (voltage code is "5")		
Current Consumption (typical)	2 mA @ 8.192MHz 3 mA @ 10 MHz 14 mA @ 77.760 MHz 26 mA @ 155.520 MHz	2 mA @ 8.192MHz 4 mA @ 10 MHz 17 mA @ 77.760 MHz 35 mA @ 155.520 MHz		5 mA @ 8.192MHz 7 mA @ 10 MHz 32 mA @ 77.760 MHz 50 mA @ 155.520 MHz				
Output Voltage Level	Logic "1"	90% V_{DD} min.						
	Logic "0"	10% V_{DD} max.						
Rise Time and Fall Time		10 nano. sec. max. 20% \leftrightarrow 80% of waveform						
Duty Cycle (Symmetry)		50% \pm 10% measured at 50% waveform						
Start-up Time		10 m. sec. max.						
Output Load		15 pF						
SSB Phase Noise at $+25^{\circ}\text{C}$ (dBc/Hz)	Offset	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	5 MHz
	M57T33-10.000 (see plot below)	-93	-117	-137	-144	-144	-151	-152
	M57T33-155.520	-62	-88	-111	-121	-116	-107	-122

⁽¹⁾: Frequency stability over temperature will be from this measured initial frequency.

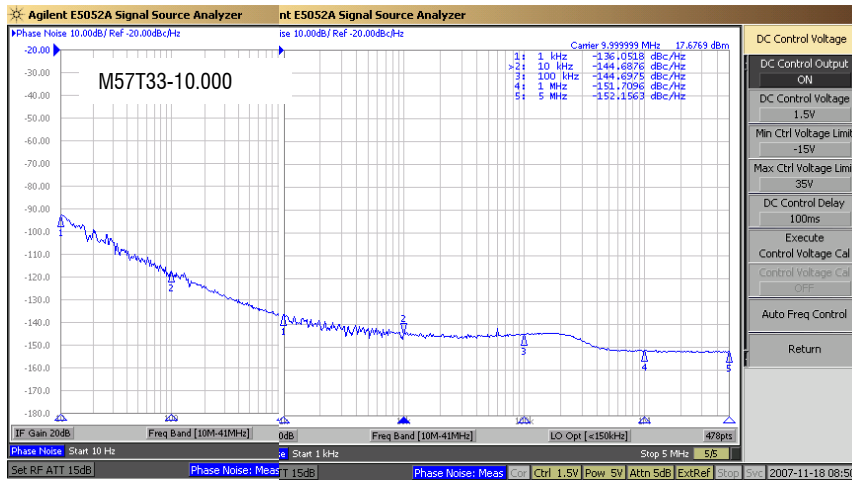
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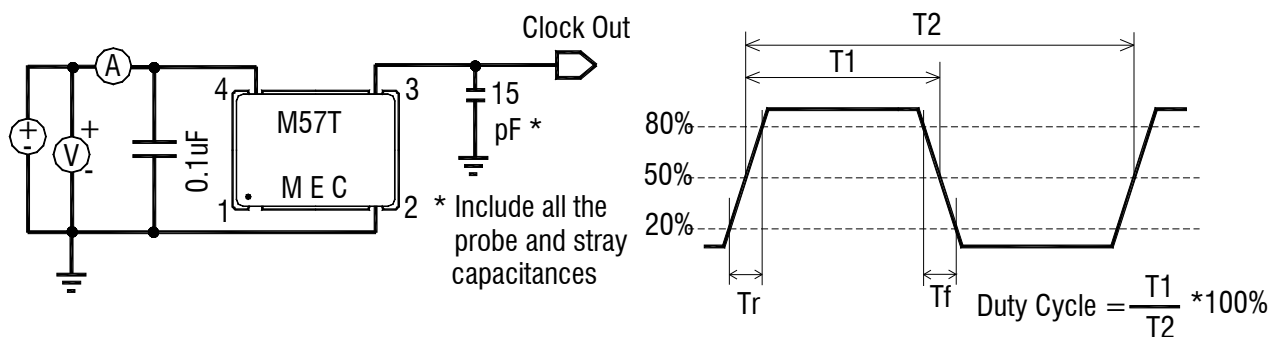
Environment Performance Specifications

Green Requirement	RoHS compliant, Pb (lead) free
MSL Level	MSL 1 per IPC/JEDEC-STD-020C
Humidity	85% RH, 85°C, 48 hours
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

Part Number Format and Example:

Part number example:	M57T3-20.000-2.5/-30+75					≠ = Please specify	
	≠		≠		≠		≠
M57T	3	—	20.000	—	2.5	/	-30+75
①	②		③		④		⑤
① : Product Series ② : Voltage code; Use "28" for +2.8 V; use "3" for +3.0 V; use "33" for +3.3 V; use "5" for +5.0 V ③ : Frequency in MHz ④ : Frequency stability ⑤ : Operating Temperature range in °C							

CMOS Square Wave TCXO Test Circuit:

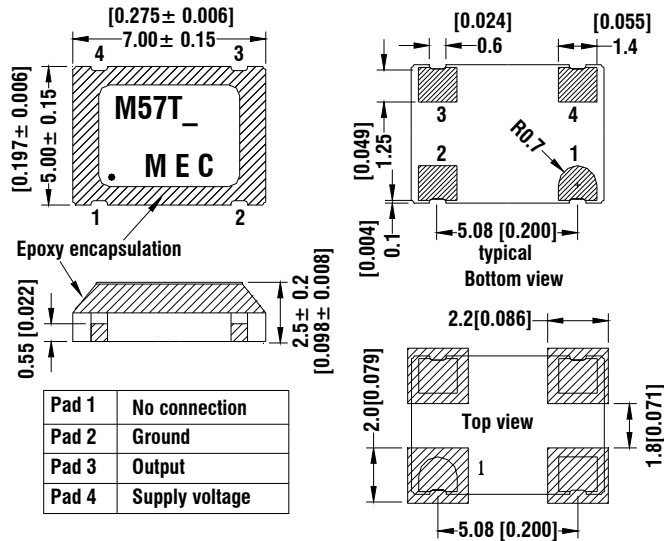


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Package Dimensions and Suggested Land Pattern: Unit: mm

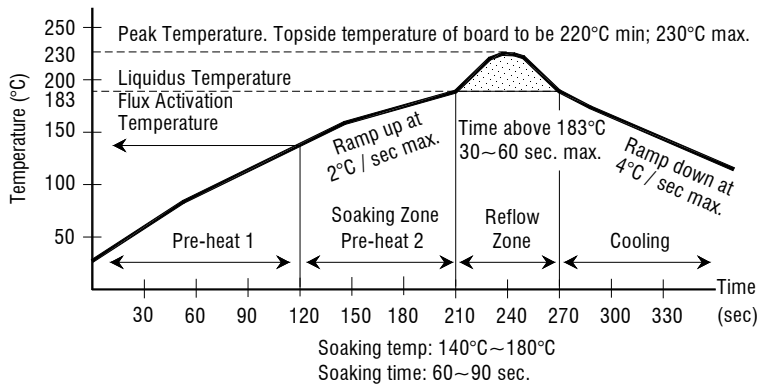


Rounded pad is pad No. 1. Count counter-clockwise when looking at top view.
 Count clockwise when looking at bottom view. 0.01 uF decoupling capacitor is built-in.

Recommended Reflow Soldering Profile

245°C liquidus 221°C solidus solder alloy is used in the assembly of M57T 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.

