

### Features:

- ◆ Suitable for non-battery operated real time clocks require 32.768 KHz reference frequency
- ◆ 5x7x2.3 mm ceramic SMD TCXOs with CMOS square wave output
- ◆ RoHS compliant



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

Product Series		M572T			
Frequency		32.768 KHz			
Output Wave Form		Square wave. Wave form code is "T"			
Initial Calibration Tolerance <sup>(1)</sup>		±2 ppm at +25°C and Vcon = +1.5 V D.C.			
Frequency Stability (ppm)		±1 ppm	±1.5 ppm	±2.0 ppm	±2.5 ppm
Temperature Range	-10 to +60°C	✓	✓	✓	✓
	-20 to +70°C	✓	✓	✓	✓
	-30 to +75°C	✓	✓	✓	✓
	-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 ±0.3 ppm max. for a ±5% 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 <sub>DD</sub> )		+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")
Output Voltage Level V <sub>DD</sub> =3.0V	Logic "1"	2.7 V min.			
	Logic "0"	0.3 V max.			
Rise Time and Fall Time		3 nano. sec. typ. 20% ↔ 80% of waveform			
Duty Cycle (Symmetry)		50%±10% measured at 50% waveform			
Start-up Time		2 m. sec. typ.			
Current Consumption		3.5 mA typ. at +3.3V / 7 mA typ. at +5.0V			
Output Load		15 pF			
SSB Phase Noise at +25°C	Offset	10 Hz	100 Hz	1 kHz	10 kHz
	Typical	-65 dBc/Hz	-100 dBc/Hz	-130 dBc/Hz	-150 dBc/Hz
Storage Temperature		-50°C to +100°C			

✓: Available  
□: Call us  
✗: Not available

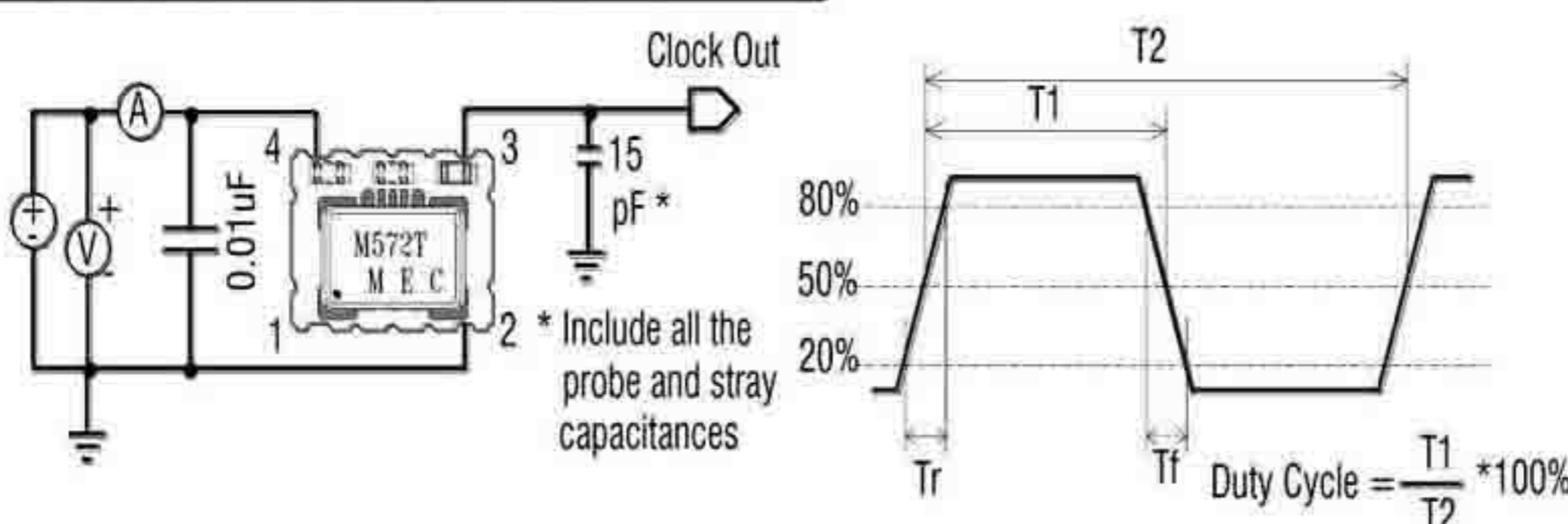
Storage Temperature Range	T <sub>STR</sub>	-55°C~+125°C	
Turnover Temperature	T <sub>M</sub>	25°C±5°C	See figure 2 in P4
Temperature Coefficient	β	-0.034±0.006ppm/°C <sup>2</sup>	
Motional (series) resistance	R <sub>1</sub>	70KΩ Max.	at 25°C
Level of drive	D <sub>L</sub>	1 μW Max.	
Aging (first year)	Δf/f <sub>0</sub>	±3ppm Max.	25°C±3°C
Quality Factor	Q	30000 Typ.	
Shunt capacitance	C <sub>0</sub>	1.05pF Typ.	

### Part Number Format and Example:

Part number example:		M572T3-32.768K-2.5/-30+75					≠ Please specify
M572T	3	—	32.768K	—	2.5	/	-30+75
①	②		③		④		⑤

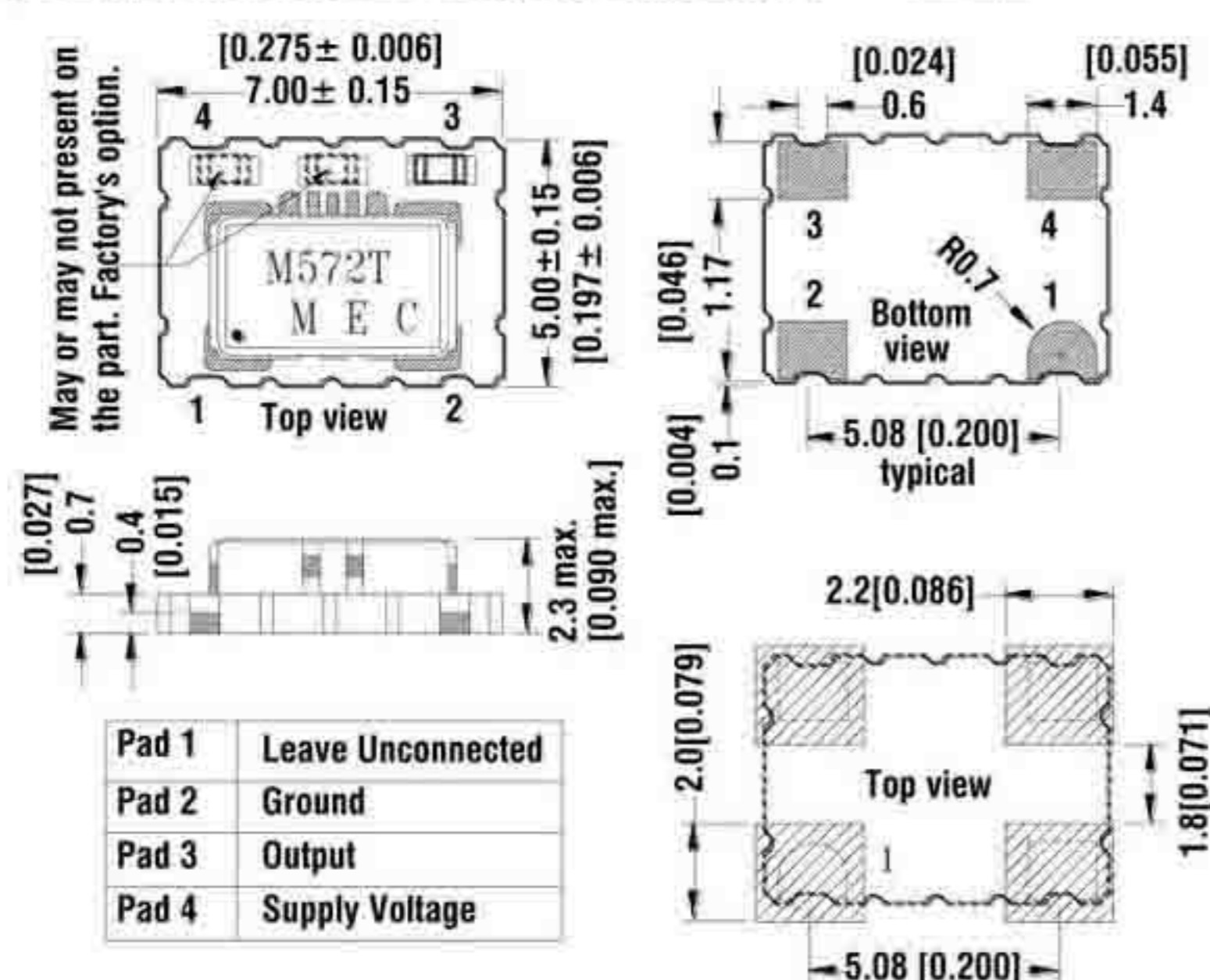
①: Product Series    ②: Voltage code; Use "28" for +2.8 V; use "3" for +3.0 V; use "33" for +3.3 V; use "5" for +5.0 V    ③: Frequency in KHz    ④: Frequency stability    ⑤: Operating Temperature range in °C

### CMOS Square Wave TCXO Test Circuit and Waveform:

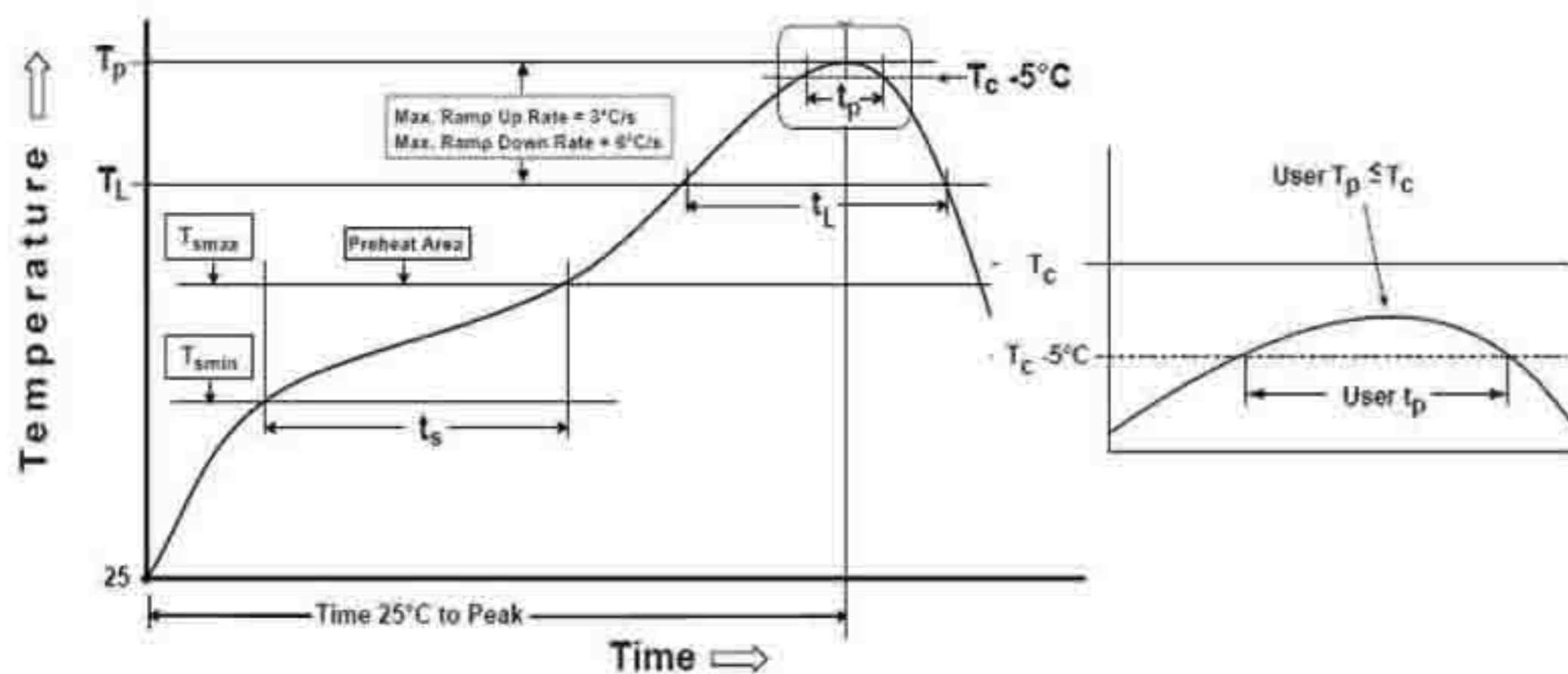


### Package Dimensions and Suggested Land Pattern:

Unit: mm



### Recommended Reflow Soldering Profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-free Assembly
Preheat/Soak		
- Temperature min. (T <sub>s</sub> min.)	100°C	150°C
- Temperature max. (T <sub>s</sub> max.)	150°C	200°C
- Time (t <sub>s</sub> ) (T <sub>s</sub> min. to T <sub>s</sub> max.)	60 to 120 seconds	60 to 180 seconds
Ramp-up rate (T <sub>L</sub> to T <sub>p</sub> )	3°C / sec. max.	3°C / sec. max.
Liquidous temperature (T <sub>L</sub> )	183°C	217°C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60 to 150 seconds	60 to 150 seconds
Peak package body temperature (T <sub>p</sub> )	235°C	260°C
Time (T <sub>p</sub> ) within 5°C of the classification temperature T <sub>c</sub>	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6°C / second max.	6°C / second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.

### Environment Performance Specifications

Green Requirement	RoHS compliant, Pb (lead) free
Moisture Sensitivity Level	MSL=1 per IPC/JEDEC J-STD-020D.1
Humidity	85% RH, 85°C, 48 hours
Hermeticity	Leak rate 2x10 <sup>-8</sup> ATM-cm <sup>3</sup> /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
ESD Protection	2.5 KV min. Human body model.
Solder Pad Surface Finish	Gold (0.3~1.2 μm) over nickel (1.27~8.89μm)