



M251x Series SPECIFICATION FOR 2.5x2.0 mm SMT CRYSTAL OSCILLATOR

FEATURES

Surface mount crystal oscillator
Compliant to RoHS directive

APPLICATIONS

Clock circuits in communications equipment
Portable and wearable devices

Ordering Information:

Product Series (Supply Voltage Option)	Temperature Range		Stability		Output Type		Symmetry		Package/Lead Configuration		Frequency MHz
	Code	Value	Code	Value	Code	Value	Code	Value	Code	Value	
M2510 (3.3V)	6	-20 to +70 °C	3	±100 ppm	T	Tristate	C	45/55 CMOS	N	Leadless	xxx.xxxxxx
M2511 (2.5V)	2	-40 to +85 °C	4	± 50 ppm							
M2512 (1.8V)			6	± 25 ppm							
			8	± 20 ppm							
Example: M251064TCN 0.032768 MHz											
M2510	6		4		T		C		N		0.032768

Electrical Specifications:

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency of Operation	F _O		32.768000		kHz	
Frequency Stability						
Frequency Stability	ΔF/F	See Ordering Information			ppm	
Output						
Output Type		HCMOS Compatible				
Output Load				15	pF	
Symmetry (duty cycle)	T _{DC}	45		55	%	Ref to ½ V _{DD}
Logic "1" Level	V _{OH}	90% V _{DD}			V	HCMOS load
Logic "0" Level	V _{OL}			10% V _{DD}	V	HCMOS load
Rise/Fall Time	T _R /T _F			50	ns	
Start-Up Time				10	ms	
Tristate Function		Logic (70% V _{DD} min) or floating				Pad 1: Enables output
		Logic (30% V _{DD} max) to a high-Z state				Pad 1: Disables output
Supply Voltage & Power Consumption						
Supply Voltage	V _{DD}	2.97	3.30	3.63	V	M2510
		2.25	2.50	2.75	V	M2511
		1.62	1.80	1.98	V	M2512
Supply Current	I _{DD}			1	mA	



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Environmental & Mechanical Requirements:

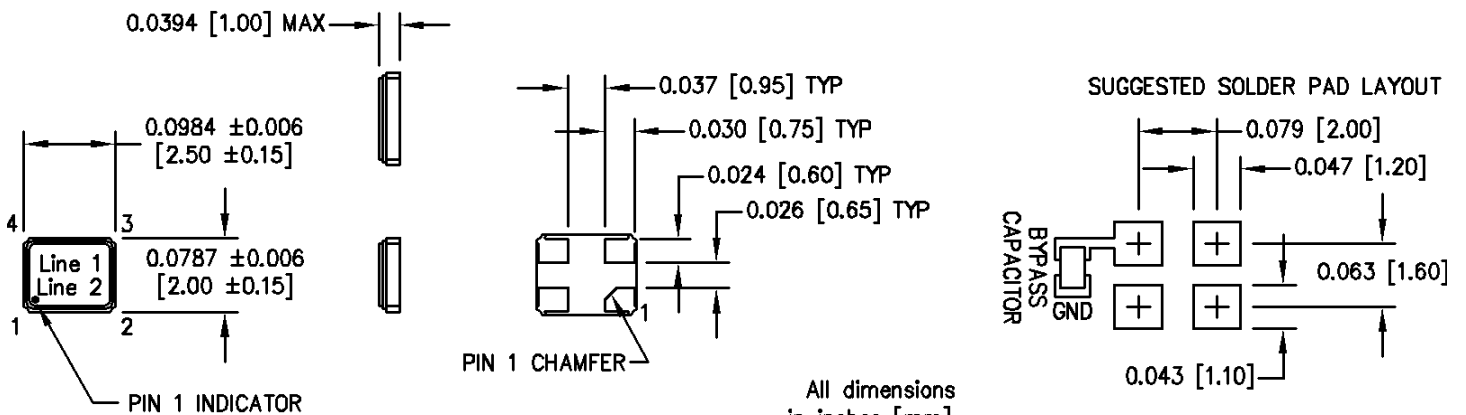
Operating Temperature	T _A	See Ordering Information		°C
Storage Temperature	T _S	-55	+125	°C
Mechanical Shock	Per MIL-STD-202, Method 213, Condition C (100 g's, 6 ms duration, 1/2 sinewave)			
Vibration	Per MIL-STD-202, Method 201 & 204 (10 g's from 10-2000 Hz)			
Thermal Cycle	Per MIL-STD-883, Method 1010, B (-55°C to 125°C, 15 min. dwell, 10 cycles)			
Hermeticity	Per MIL-STD-202, Method 112 (1 x 10 ⁻⁸ atm cc/s of Helium)			
Solderability	Per EIAJ-STD-002			
Max. Soldering Conditions	See solder profile, Figure 1			
Package Type	2.0 X 2.5 X 1.0 mm, 4-pad leadless ceramic. RoHS 6/6 compliant			

Dimensions, Marking, and Pin Out Information:

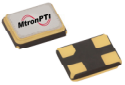
Pad	Function
1	Tristate
2	Ground
3	Output
4	+V _{DD}

Part Marking (32.768 kHz)	
Line 1	32K768
Line 2	M ywwv

Legend	
y	Year
ww	Work week
v	Factory code



Note : Layout should include 0.01 μF or larger bypass capacitor between +V_{DD} and ground.



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Reflow Soldering Conditions:

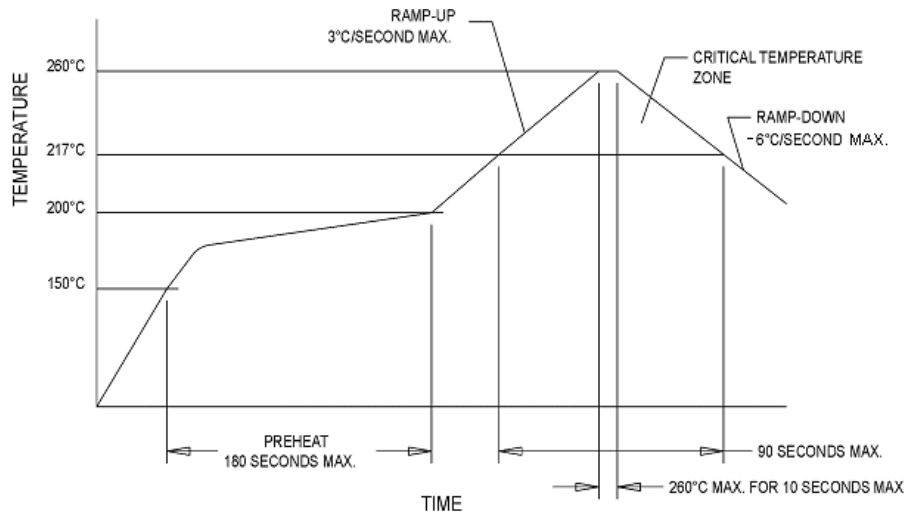
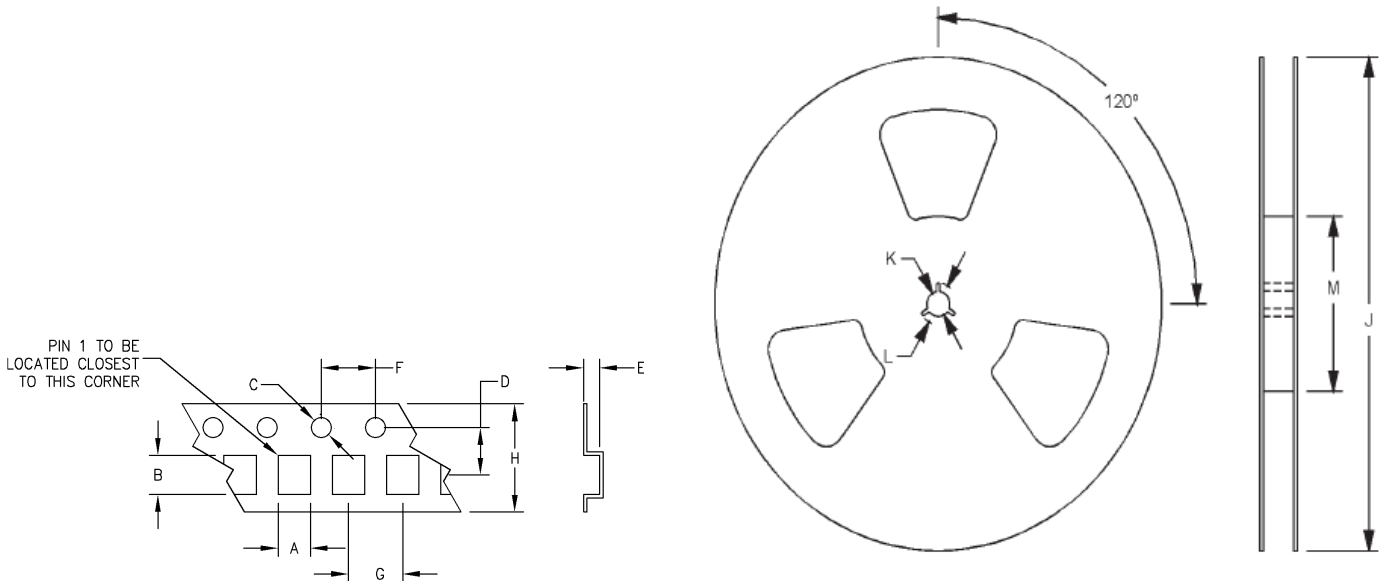


Figure 1

Tape and Reel Specifications:



All dimensions are in mm.

A	B	C	D	E	F	G	H	J	K	L	M
2.4	2.9	1.55	3.5	1.2	4	4	8	178	13	21	60

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