

M1532 Series SPECIFICATION FOR 1.5x3.2 mm TUNING FORK SMT CRYSTAL

FEATURES

Surface mount 32.768 kHz crystal
with optional lower resistance value
Compliant to RoHS directive

APPLICATIONS

Real time clock circuits in communications equipment,
test equipment; and portable and wearable devices.

Ordering Information:

Product Family	Temperature Range		Tolerance at +25 °C		Stability		Load Capacitance		Resistance		Frequency
	Code	Value	Code	Value	Code	Value	Code	Value	Code	Value	
M1532	2	-40 to +85 °C	G	±20 ppm	Z	Parabolic Curve	Blank	12.5 pF (standard)	Blank	70 kohm max. (std.)	0.032768 MHz
							9	9 pF			
							6	6 pF	L	50 kohm max.	
							Other	Consult factory			
Example: M15322GZ 0.032768 MHz											
M1532	2		G		Z						0.032768 MHz

Electrical Specifications:

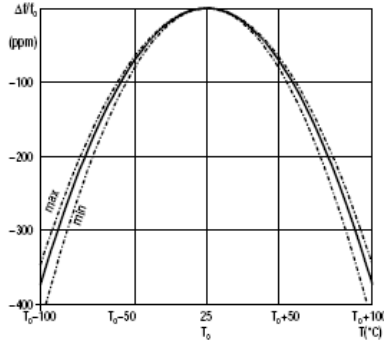
Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Mode of Oscillation		Fundamental (XT cut)				
Frequency	F _O	0.032768			MHz	
Frequency Tolerance	ΔF/F	-20		+20	ppm	@ +25 °C
Frequency Stability	ΔF/F	Parabolic Curve				Ref to +25 °C
Turnover Temperature	T _T	+20	+25	+30	°C	
Parabolic Curve Const.	B	-0.028	-0.034	-0.040	ppm/°C ²	
Operating Temperature	T _A	-40		+85	°C	
Aging		-3		+3	ppm/year	@ +25 °C
Load Capacitance	C _L	See ordering information (standard is 12.5 pF)			pF	
ESR	R _s			70	kΩ	standard @ +25 °C
				50	kΩ	"L" option @ +25 °C
Shunt Capacitance	C _O		0.95		pF	standard @ +25 °C
			1.3		pF	"L" option @ +25 °C
Drive Level	D _L			1	μW	standard
				0.5	μW	"L" option

Environmental & Package Specifications:

Storage Temperature	-55°C to 125°C
Mechanical Shock	3 drops from 75 cm onto a hard wood board; ±5 ppm maximum frequency change
Vibration	10 to 55 Hz, 1.5 mm double amplitude, 1.5 minute sweep, 2 hrs. in each of 3 mutually perpendicular axes, 6 hrs. total; ±5 ppm maximum frequency change
Humidity	+65 °C, 95% RH, 500 hrs.; ±10 ppm maximum frequency change
Thermal Shock	-40 °C to +100 °C, 30 minute dwell times, 5 cycles; ±5 ppm maximum frequency change
Hermeticity	1E-7 atm cc/s
Moisture Sensitivity Level	MSL1
Solderability	Per EIAJ-STD-002
Max. Soldering Conditions	See solder profile, Figure 1
Pad Termination	Gold, 0.3 μm to 1.0 μm thickness
Package Type	2-pad 1.5 X 3.2 X 0.9 mm leadless ceramic. RoHS compliant.

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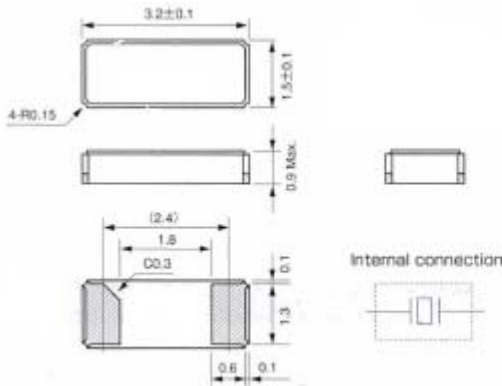
Frequency vs. Temperature Characteristics:



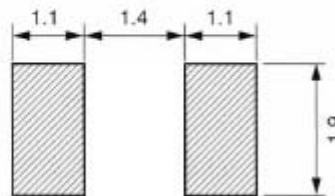
Marking:

Standard		“L” option
y m ###		y m L ##
Legend		
y = last digit of year of manufacture		
m = code for month of manufacture (1 = January . . .		
9 = September ; X = October . . . Z = December		
### or ## = factory lot number		

Dimensions:



Recommended Pad Lay Out



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Reflow Soldering Conditions:

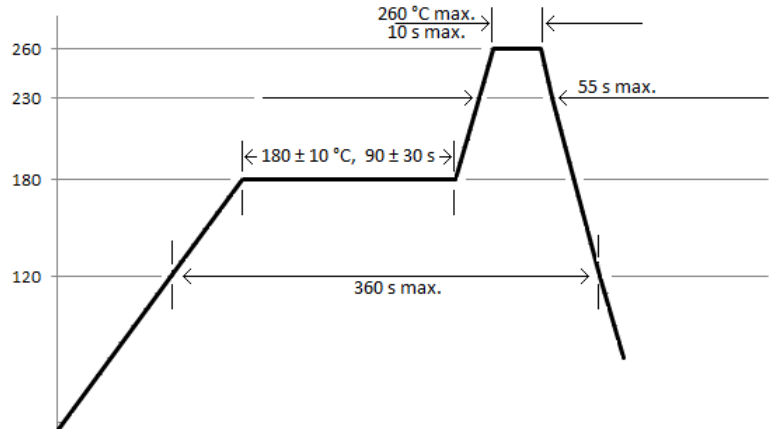
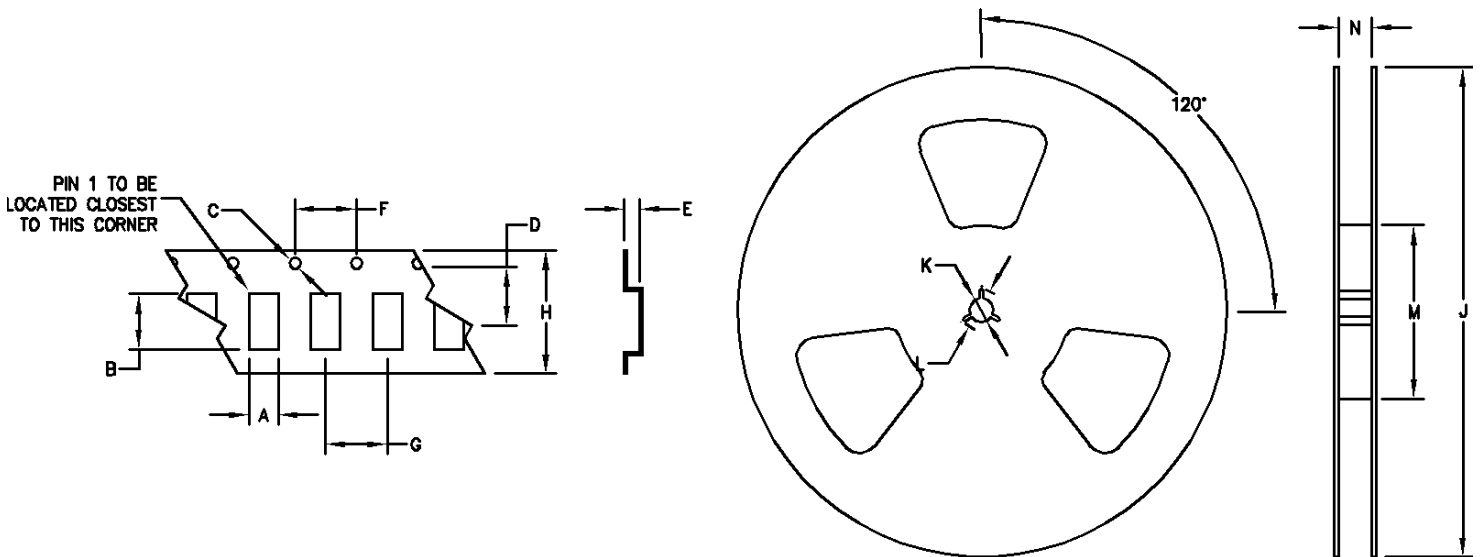


Figure 1

Tape and Reel Specifications:



Tape and Reel Specifications												
A	B	C	D	E	F	G	H	J	K	L	M	N
1.9	3.6	1.5	5.5	1.0	4.0	4.0	12.0	180	13.0	21.0	60.0	13.0

Units per reel = 3,000.

Revision 0
10/07/15