3.2mm x 2.5mm Ceramic SMD Package, CMOS TCXO Oscillator

I539 Series

Product Features:
- LVCMOS compatible output
- Small Footprint SMD Package
- Five Supply Voltages options, 1.8V, 2.5V, 3.0V, 3.3V, 5.0V
- RoHS and REACH compliant

Typical Applications:
- Real Time Clock
- Metering
- Industrial Control
- System Clock

ELECTRICAL SPECIFICATIONS

Frequency Range	32.768kHz	
Frequency Stability	±5ppm Maximum	Inclusive of Operating Temperature Range, at Vdd
Frequency Stability vs. Frequency Tolerance	±1.5ppm Maximum	At 25°C ±2°C, at Vdd, Pre-Reflow
Frequency Stability vs. Input Voltage	±0.2ppm Maximum	±5%
Frequency Stability vs. Load	±0.2ppm Maximum	±1pF
Frequency Stability vs. Reflow	±1.0ppm Maximum	At 25°C, 24 hours after reflow, 2 times
Frequency Stability vs. Aging	±3ppm/Year Maximum	At 25°C, First Year
Operating Temperature Range	-40°C to +85°C	
Supply Voltage (Vdd)	1.8V, 2.5V, 3.0V, 3.3V, 5.0V	±5%
Input Current	(No Load) 2µA Maximum 3µA Maximum 5µA Maximum	 1.8V 2.5V, 3.0V, or 3.3V 5.0V
Output Voltage Logic High	Vdd -0.4Vdc Minimum	IOH = -0.1mA
Output Voltage Logic Low	0.4Vdc Maximum	IOL = +0.1mA
Rise / Fall Time	100nSec Maximum	Measured from 20% to 80% of waveform
Duty Cycle	50 ±10(%)	Measured at 50% of waveform
Output Drive Capability	15pF Maximum	
Output Logic Type	CMOS	
Pin 1 Connection	Tri-State (High Impedance)	
Input Voltage Logic High	90% of Vdd Minimum to Enable Output	
Input Voltage Logic Low	10% of Vdd Maximum to Disable Output (High Impedance)	
Standby Current	1µA Maximum	Disabled Output, High Impedance
Startup Time	3Sec Maximum	

NOTES:
- All minimum and maximum limits are specified over temperature and rated operating voltage with 15pF output unless otherwise stated.
- A 0.1µF bypass capacitor is recommended between Vdd (pad 4) and GND (pad 2) to minimize power supply noise.

ABSOLUTE MAXIMUM LIMITS

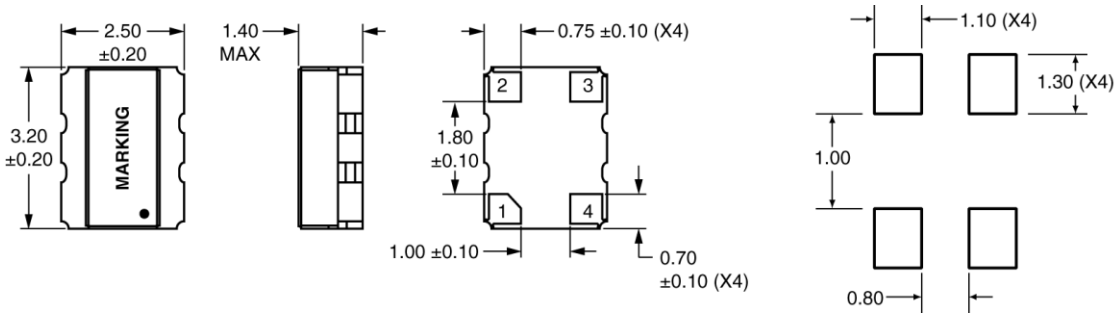
Storage Temperature Range	-40°C to +125°C
Supply Voltage Range	-0.3Vdc to Vdd +0.3Vdc
Electrostatic Discharge	2000V Maximum
Solder Temperature	260°C Maximum
Junction Temperature	150°C Maximum

NOTE: If the part is used beyond absolute maximum ratings, it may cause internal destruction. The part should be used under the recommended operating conditions or the reliability of this part may be damaged if those conditions are exceeded.

ENVIRONMENTAL SPECIFICATIONS

ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Fine Leak	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak	MIL-STD-883, Method 2002, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture Sensitivity	J-STD-002, MSL 1
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A

MECHANICAL & SOLDER PAD LAYOUT DIMENSIONS



Pin	Connection
1	Tri-State
2	Ground
3	Output
4	Supply Voltage

All Dimensions in Millimeters

PART NUMBER GUIDE

Series	Operating Temperature Range	Frequency Stability	Supply Voltage	Pin 1 Connection	Frequency
I539	2 = -40°C to +85°C	J = ±5.0ppm	1 = 1.8V	H = Tri-State	32.768 kHz
			6 = 2.5V		
			7 = 3.0V		
			3 = 3.3V		
			5 = 5.0V		

Sample Part Number: I539-2J3H-32.768 kHz

NOTES: • Please consult with Sales Department any other parameters or options.

MARKING

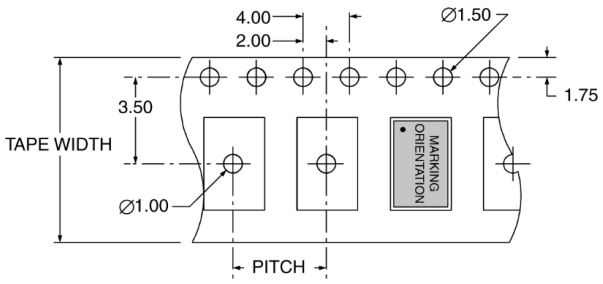
Line 1: 32.768K
Line 2: XXXXXX (Date Code)

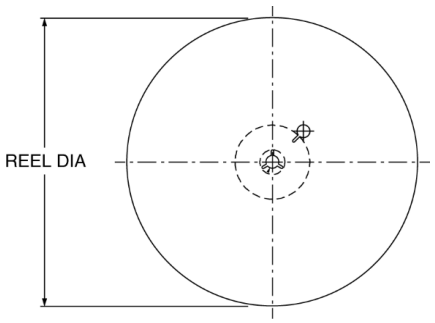
Pin 1 Dot

PACKAGE INFORMATION

Termination = e4 (Au over Ni over W base metallization)
Terminal Plating Thickness:
Gold (0.3µm to 1.0µm), Nickel (1.27µm to 8.89µm)

TAPE & REEL DIMENSIONS

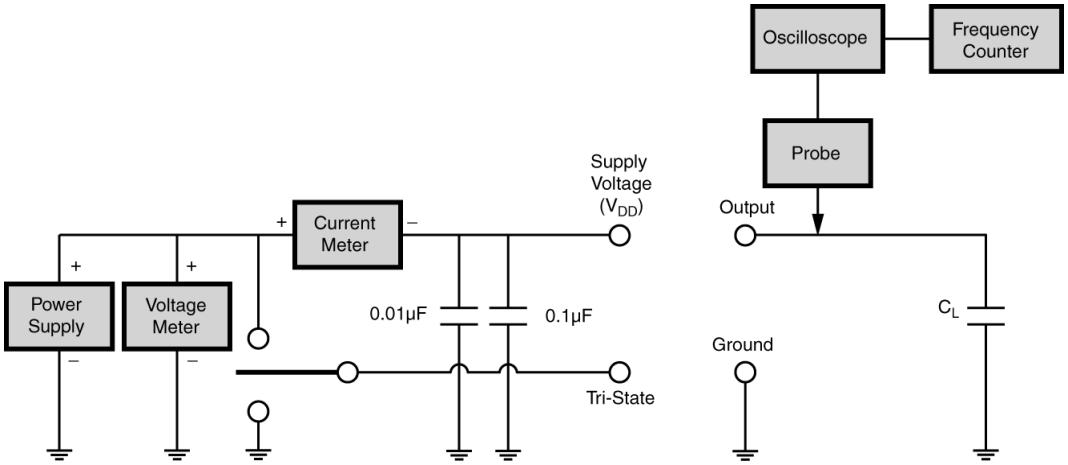




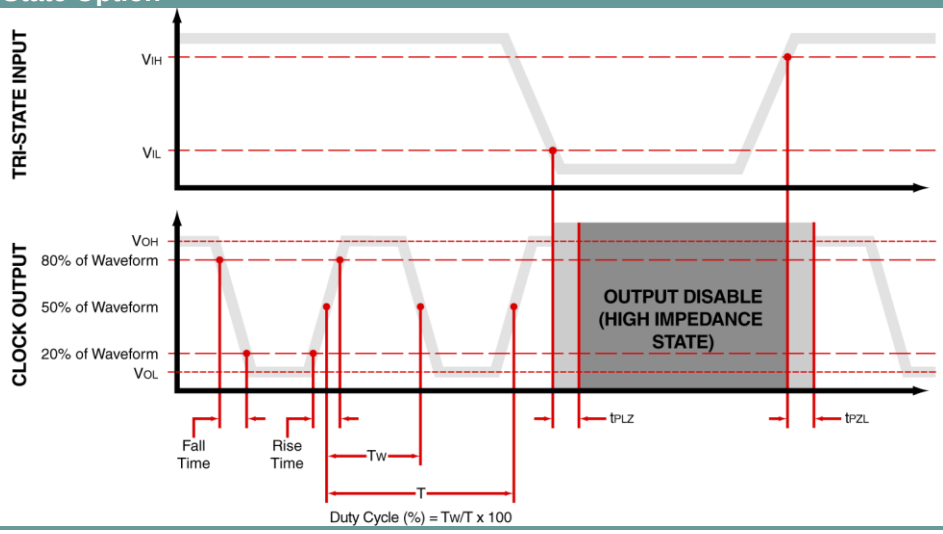
PITCH	4.00
TAPE WIDTH	8.00
REEL DIA	180
QTY PER REEL	3,000

All Dimensions in Millimeters

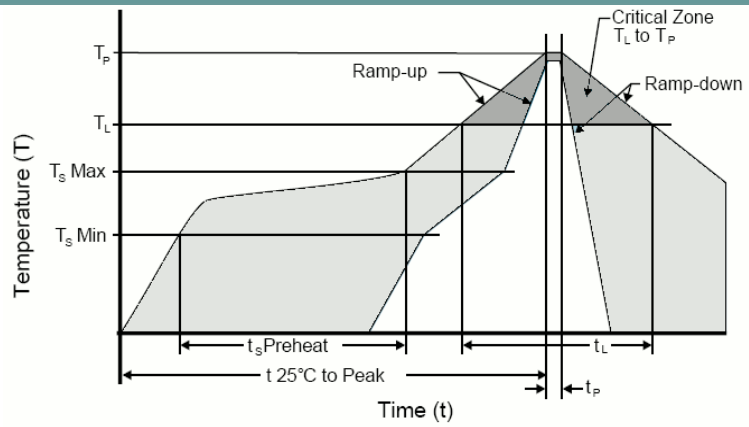
TEST CIRCUIT: Tri-State Option



WAVEFORM: Tri-State Option



SOLDER REFLOW PROFILE



Units are backward compatible with +240°C reflow process

Ts max to T_L (Ramp-up Rate)	3ºC / second max
Preheat Temperature min (Ts min) Temperature typ (Ts typ) Temperature max (Ts max) Time (Ts)	 150ºC 175ºC 200ºC 60 to180 seconds
Ramp-up Tate (T_L to Tp	3ºC / second max
Time Maintained Above Temperature (T_L) Time ($T_{L)}$	 217ºC 60 to 150 seconds
Peak Temperature (Tp)	260ºC max for 10 seconds
Time within 5ºC to Peak Temperature (Tp)	20 to 40 seconds
Ramp-down Rate	6ºC / second max
Tune 25ºC to Peak Temperature	8 minute max
Moisture Sensitivity Level (MSL)	Level 1