

MV-TC650-3225T is a Temperature Compensated Crystal Oscillator (TCXO) . This TCXO is analog temperature compensated, CMOS output device and comes in a hermetic ceramic 3.2x2.5mm package. This device contains an internal voltage regulator resulting in excellent power supply rejection ratio.

The device is qualified to meet the JEDEC standard for Pb-Free assembly and compliant to the RoHS directive.

**Electrical Performance**

Parameter	Min	Typ	Max	Units
<b>General</b>				
Output Frequency	13		52	MHz
Operating Temperature		-10/+70 to -40/+85		°C
Frequency Stability				
Stability Over Temperature		±2.0 to ±0.5		ppm
Initial Accuracy (25°C ±2°C)			±2.0	ppm
Power Supply Stability (±5% Change)			±0.2	ppm
Load Stability (±10% Change)			±0.2	ppm
Aging (1st year)			±1.0	ppm/year
Start Up Time			2	ms
Package Size		3.2 x 2.5 x 1		mm
<b>Supply</b>				
Supply Voltage (Vdd)		+1.8 to +3.3		V
Supply Current			5	mA
<b>Tuning</b>				
Tuning (Pull) Range		±5 to ±15		ppm
Tuning Slope		Positive		
Control Voltage to reach Pull Range		0.9±0.6 (@1.8), 1.4±1 (@2.8), 1.65±1 (@3.3)		V
Control Voltage Impedance	100			KΩ
<b>Output</b>				
Output Signal		CMOS		
Output Level	Vdd x 0.9			V
Output Level - Logic Low			Vdd x 0.1	V
Output Load		15 pF		
Duty Cycle	45		55	%
<b>Phase Noise &amp; Jitter</b>				
Phase Noise: (32 MHz)				
1 Hz offset		-58		dBc/Hz
10 Hz offset		-86		dBc/Hz
100 Hz offset		-110		dBc/Hz
1kHz offset		-135		dBc/Hz
10kHz offset		-143		dBc/Hz
100kHz offset		-152		dBc/Hz
1MHz offset		-153		dBc/Hz
Jitter				
RMS Jitter: (12kHz - 20MHz) - 32 MHz		0.15		ps

**Notes:**

- 1 Rise and Fall times measured from 10% to 90% of a full output swing

**Maximum Ratings**

Storage Temp	-55°C to 125°C
Supply Voltage	0V to +5.5V
Control Voltage	0V to Vdd
Junction Temperature	+125 °C

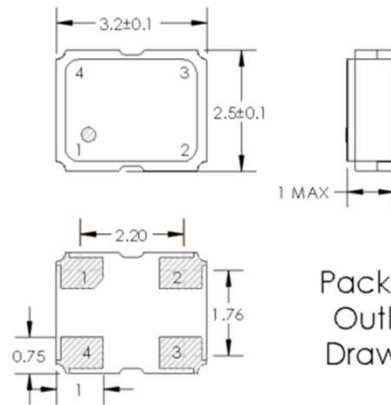
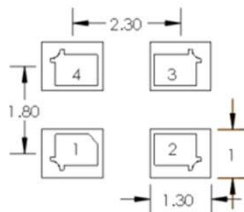
**Maximum Ratings Notes:**

- 1 Stresses in excess of the absolute maximum ratings can permanently damage the device.
- 2 Exposure to absolute maximum ratings for extended periods may adversely affect device reliability.

**Package Information**

Pin #	Function
Pin 1	Vc = Control Voltage or NC
Pin 2	GND = Ground
Pin 3	OUT = Output
Pin 4	Vdd = Supply Voltage

Pad Layout



Package Outline Drawing

**Handling and Construction**

Package Construction	hermetic ceramic
Contact Pads	Gold over Nickel
Moisture Sensitivity Level	MSL 1
ESD, Human Body Model	500V
ESD, Charge Device Model	500V

Ordering Information

**MV-TC650-3225T -**

TCXO, CMOS  
3.2 x 2.5 x 1mm, 4 Pins

**X X X X**

① ② ③ ④

**- xxMxxxxx**

Frequency

① Voltage

B: 3.3 V  
C: 2.8 V  
E: 1.8 V

② Temp Range

J: -10/+70 °C  
H: -20/+70 °C  
K: -40/+85 °C  
P: -30/+85 °C

③ Temp Stability

N: ±2.0 ppm  
P: ±1.5 ppm  
Q: ±1.0 ppm  
R: ±0.5 ppm

④ Tuning Range

X: No Tuning  
L: ±5 ppm  
K: ±8 ppm  
J: ±10 ppm  
H: ±12 ppm  
G: ±15 ppm