

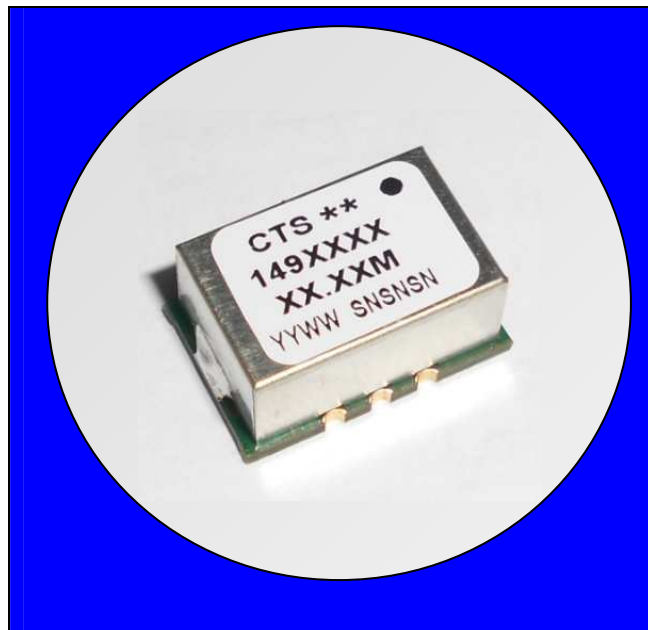
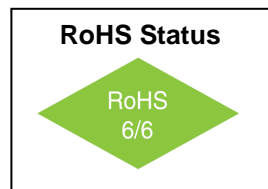
### FEATURES:

- Industry Standard 9x14mm SMT Footprint
- 3.3V operation
- Commercial or Industrial temperature range
- CMOS output
- Low Phase Noise
- Electrical Frequency Adjustment Option

### DESCRIPTION:

The CTS model 149 is a small size, high performance SMT OCXO.

**APPLICATIONS:** Telecom Switching  
Wireless Communication



### ELECTRICAL SPECIFICATIONS

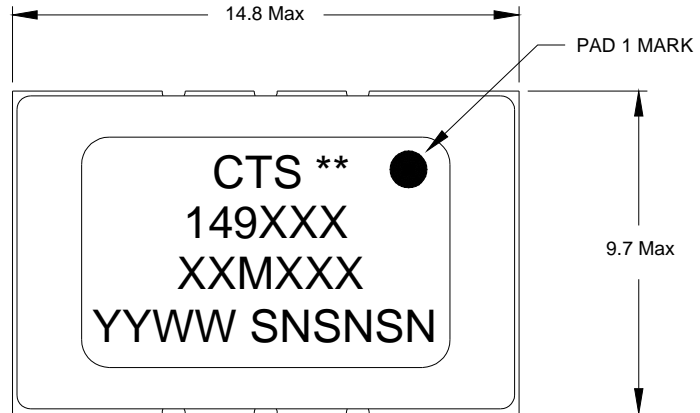
Parameter	Conditions & Remarks	Min	Typical	Max	Unit
<b>Operating Conditions</b>					
Operating Temperature Range	T <sub>OP</sub>	-40	-	+85	°C
Supply Voltage	3.3V	3.135	3.300	3.465	V <sub>dc</sub>
Supply Power	Warm-Up	-	-	2.7	W
	Steady State @ +25°C	-	-	1	W
Output Load		13.5	15	16.5	pF
<b>Frequency Stability</b>					
Available Frequencies	f <sub>NOM</sub>	-	10, 12.8, 19.2, 20, 25	-	MHz
Initial Frequency Tolerance	@ 25°C , at time of shipment	-	-	± 0.200	ppm
Freq. vs Temperature (ref to +25C) (See code option Table 1)	-0°C to 70°C	-	± 6	± 10	ppb
	-20°C to 70°C	-	± 12	± 20	ppb
	-40°C to 85°C	-	± 25	± 50	ppb
Freq. vs Supply Voltage	V <sub>CC</sub> ± 5%	-	± 1	± 5	ppb
Freq. vs Load	For ± 5% change	-	± 1	± 5	ppb
Freq. vs Time (Aging)	per day	-	-	± 2.0	ppb
	Per year	-	-	± 300	ppb
	10 years	-	-	± 1.5	ppm
24 Hours Holdover Stability (Inclusive of Temperature, Supply Variation and 24 hours Aging)	Option B	-	-	± 15	ppb
	Option D	-	-	± 25	ppb
	Option G	-	-	± 55	ppb
Total Free-Run Accuracy	All causes for 10years	-	-	± 1.6	ppm
Short Term Stability (ADEV)	1.0 sec	-	-	0.05	ppb
Warm-Up Time	@ 25°C, to within 50 ppb of final frequency	-	-	5	minutes

Parameter	Conditions & Remarks	Min	Typical	Max	Unit	
<b>Output Parameters</b>						
Amplitude		$V_{OL}$	-	-	0.4	V
		$V_{OH}$	2.4	-	-	
Rise/Fall Times	10% to 90% @ 15pf load	-	-	5	ns	
Duty Cycle	@ 50% of output waveform	45	50	55	%	
Phase Noise (Typical for 25MHz)		1Hz	-	-85	-	dBc/Hz
		10Hz	-	-100	-	dBc/Hz
		100Hz	-	-130	-	dBc/Hz
		1kHz	-	-140	-	dBc/Hz
		10kHz	-	-150	-	dBc/Hz
		100kHz	-	-150	-	dBc/Hz
<b>Electronic Frequency Adjustment (Optional)</b>						
EFC Control Voltage	$V_C$	0.0	1.65	3.3	volts	
Frequency Adjust Range		$\pm 2.0$	-	$\pm 4.0$	ppm	
Slope	Positive, monotonic	-	-	-		
Input Impedance	$Z_{IN}$	100	-	-	Kohms	
Linearity		-	-	$\pm 10$	%	

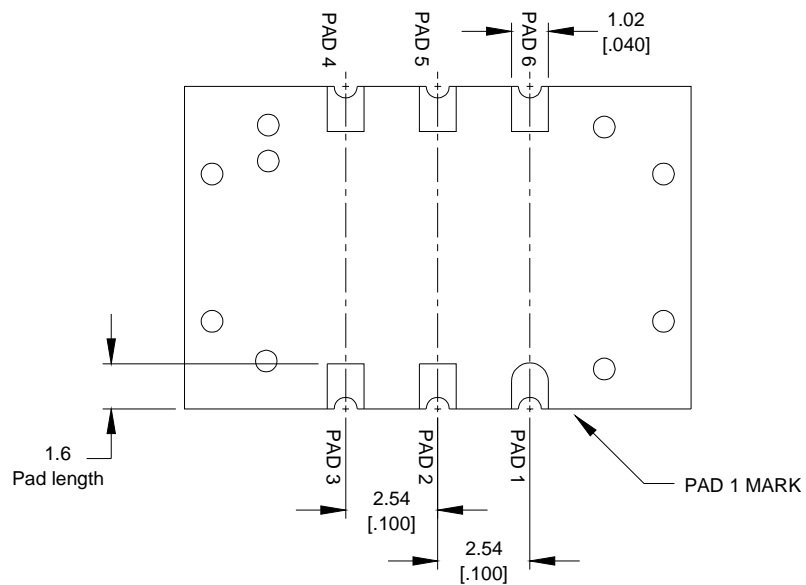
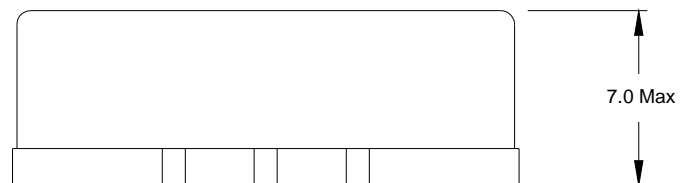
**MECHANICAL SPECIFICATIONS**

**PACKAGE DRAWING**

PAD	CONNECTION
1	Control Voltage - Vc or N/C
2	N/C
3	GROUND
4	OUTPUT
5	N/C
6	SUPPLY VOLTAGE - Vcc



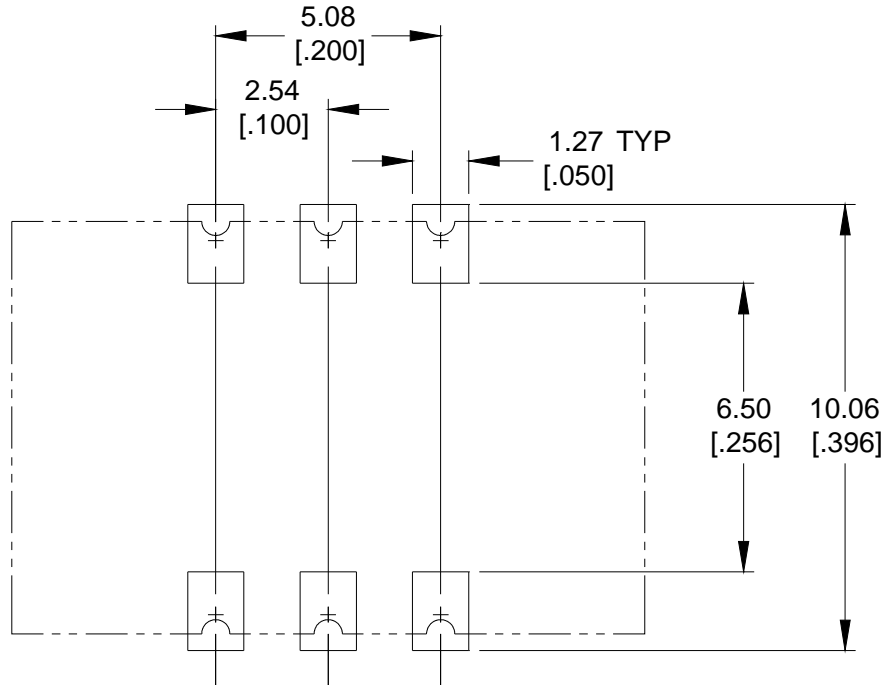
\*\* Site Code  
 SNSNSN Serial Number  
 YYWW Date Code



ALL DIMENSIONS ARE IN MM [INCHES].  
 ALL DIMENSIONS ARE NOMINAL UNLESS OTHERWISE SPECIFIED.

**MECHANICAL SPECIFICATIONS (Continued)**

**SUGGESTED SOLDER PAD GEOMETRY**



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ALL DIMENSIONS ARE NOMINAL.

**Environmental and Mechanical Requirements**

Storage Temperature : -40°C to +105°C

Reflow profile : >217°C, 2.5min and 26 0°C (Absolute max temperature), 10secs.  
Note: Part is not designed to be reflowed in an inverted position.

Mechanical shock : 100g, 6mS duration, 1/2 sine wave, 3 shocks each direction along 3 mutually perpendicular planes.

Drop : 10 cm height, 3 times onto hard board with thickness of 3cm.

**Mechanical vibration**

**Random**

: Frequency range: 1Hz-4Hz-100Hz-200Hz  
Acceleration: 0.0001g<sup>2</sup>/Hz-0.01g<sup>2</sup>/Hz-0.01g<sup>2</sup>/Hz-0.001g<sup>2</sup>/Hz  
Grms=1.15g

Duration: 30 minutes (per axes)

**Sine**

: 10 – 55 Hz, 0.75mm DA, Sweep time 30 minutes (per axis)

**MSL**

: Level 2

**Table 1**

Generate CTS part number for standard options. (See factory representative for other requirements.)

Model	Temperature Range	Supply Voltage	Electronic Frequency Control	Frequency Code
149				M

Code	Specification
B	0°C to +70°C
D	-20°C to +70°C
G	-40°C to +85°C

Code	Specification
V	EFC
N	No EFC

Code	Specification
E	3.3V +/- 5%

Code	Frequency
10M000	10.000 MHz
12M800	12.800 MHz
19M200	19.200 MHz
20M000	20.000 MHz
25M000	25.000 MHz

Part Number Example: 149BEN10M000

**Packing: Tape and Reel**

