Model 150

Stratum 3, 9x14 mm OCXO

Features

- 10 to 50 MHz Frequency Range
- Compliant to Stratum 3 of GR-1244-CORE
- Surface Mount
- 3.3V or 5.0V operation
- Low Jitter/Phase Noise
- Tape and Reel Packaging

Applications

- Telecom Switching
- Wireless Communication
- Timing over Packet

Part Dimensions:
9.7 × 14.9 x 7.0 mm

Description

The CTS Model 150 is a low cost, small size, high performance OCXO. The high quality AT Quartz Crystal used in this OCXO offers high stability and low jitter/phase noise, making it the ideal choice for any telecommunications system.

Ordering Information – Table 1

Model	Temp Range	Stability*	Supply Voltage	Electronic Freq Control	Frequency Code
150	B	R	E	N	20M000

Code	Temp range
A	0 to 50°C
B	0 to 70°C
C	-10 to 60°C
D	-20 to 70°C
G	-40 to 85°C

Code	Supply
D	5.0V ±5%
E	3.3V ±5%

Code	Frequency (MHz)
20M000	20.000
XXMXXX	XX.XXX

Code	Stability
N	±250 ppb
P	±200 ppb
R*	±100 ppb

Code	Spec
V	EFC
N	No EFC

Standard Frequencies (MHz)
10.000
12.800
19.200
20.000
24.576
25.000
49.152

Part Number Example:
150BREN20M000

* Choose stability option R for full GR-1244-CORE, Stratum 3 holdover and wander generation performance.

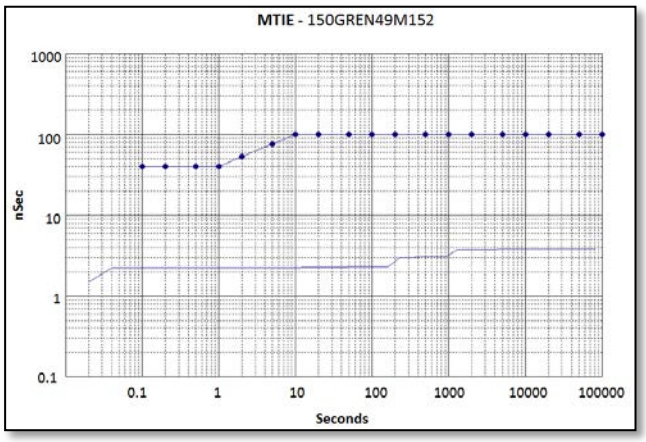
Electrical Specifications

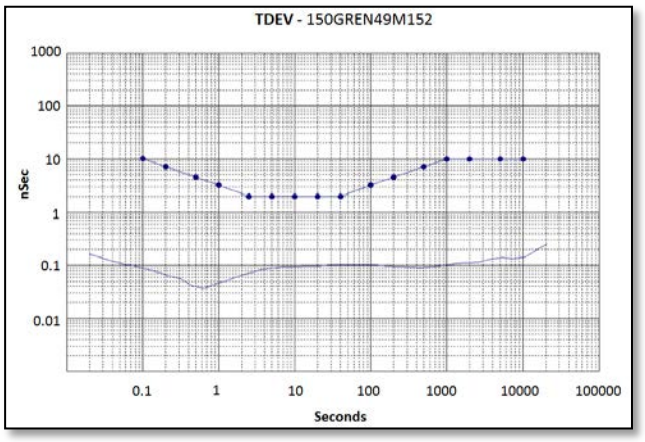
Parameter	Conditions & Remarks		Min	Typical	Max	Unit
Operating Conditions						
Operating Temperature Range	T_{OP}		-40	-	85	°C
Supply Voltage	V_{CC}: 3.3V or 5.0V		3.135 4.75	3.3 5.0	3.465 5.25	Vdc
Power Consumption	Warm-up Steady State; T_A = 25°C		- -	- 0.7	2.7 1	W
Load			13.5	15	16.5	pF
Frequency Stability						
Frequency	F_{NOM}		10	-	50	MHz
Initial Frequency Tolerance	@25°C, at time of shipment		-	-	±0.5	ppm
Freq. vs Temperature (See options - Table 1)	-40°C to 85°C (ref to +25C)		-	-	±100	ppb
Freq. vs Supply Voltage	V_{CC} ±5%		-	-	±50	ppb
Freq. vs Load	15 pf ±5%		-	-	±50	ppb
Freq. vs Time (Aging)	After 30 days of operation		- - -	±2 ±300 ±3	- - -	ppb/day ppb/year ppm/10 yrs
Free run accuracy	All causes – 10 years		-	-	±4.6	ppm
Short Term Stability (ADEV)	1.0 sec		-	-	0.1	ppb
Warm-up time	@ 25°C, After 5 mins referenced to the freq after 1 hour on		-	-	±500	ppb
Holdover Stability (24 hours)	- Constant temperature - Over Ambient temperature (See options - Table 1)		- -	- -	±10 200	ppb ppb, pk-pk
Wander Generation	Meets Stratum 3 MTIE and TDEV requirements per Telcordia GR-1244-CORE (See Table 1)					
Output Parameters						
CMOS Output Levels	3.3V (LVCMOS) 5.0V (HCMOS)	V_{OL} V_{OH}	- - 2.4 3.0	- - - -	0.4 0.4 - -	Vdc
Rise/Fall Times	10% to 90%, 15pf load		-	-	5	ns
Duty Cycle	@50% of output signal		45	50	55	%
Phase Noise (Typical for 25.0 MHz)		1 Hz 10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	- - - - - -	-70 -100 -125 -142 -148 -151	- - - - - -	dBc/Hz

Electrical Specifications (Continued)

Parameter	Conditions & Remarks		Min	Typical	Max	Unit
Electronic Frequency Control - EFC (Optional)						
EFC Control Voltage	V_C	3.3V 5.0V	0.0 0.0	1.65 2.5	3.3 5.0	Volts
Frequency Adjust Range			±5.0	-	-	ppm
Slope	Positive, monotonic		-	-	-	
Input Impedance	Z_{IN}		100	-	-	Kohms
Linearity			-	-	10	%

Typical Stratum 3 Wander Generation performance per Telcordia GR-1244-CORE (locked through a 0.1Hz loop bandwidth)



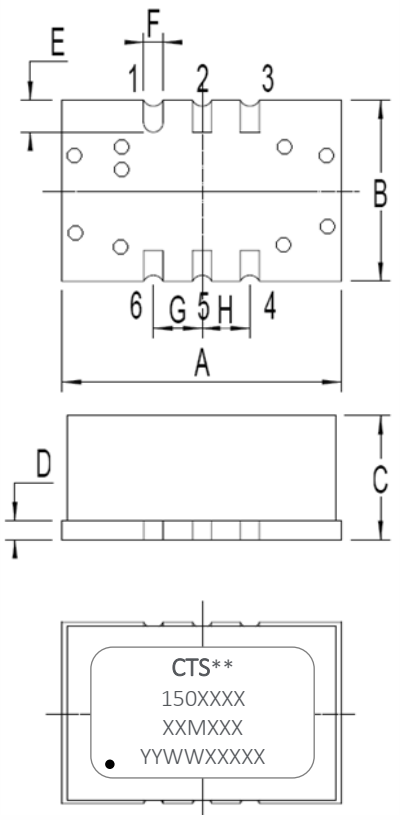


Mechanical and Environmental

Storage Temperature Range	-55°C to +105°C	
Operating Temperature Range	-40°C to +85°C	
Reflow Profile	Per IPC/JEDEC J-STD-020D; >217°C, 1.5min and 245°C (Absolute max temperature), 10 secs. **Note:** This product is not designed to be reflowed in an inverted position.	
Mechanical Shock	100g, 6ms, 1/2 sinewave, 3 shocks each direction along 3 mutually perpendicular planes.	
Drop	10 cm height, 3 times onto hard board with thickness of 3 cm. - IEC60028-2-32 test Ed.	
Bumping	40g, 6mS, 4000 ±10 times in each of three mutually perpendicular axes	
Mechanical Vibration	Random:	Frequency range: 1Hz-4Hz-100Hz-200Hz Acceleration: 0.0001g²/Hz - 0.01g²/Hz - 0.01g²/Hz - 0.001g²/Hz Grms=1.15g. Duration: 30 minutes (per axis)
	Sine:	10 - 55 Hz, 0.75mm DA, Sweep time 30 minutes per axis
Thermal Shock	-40°C ~ +85°C. 0.5 hour dwells with <30 second transitions. 100 cycles	
RoHS	Lead Free, and fully compliant to RoHS Directive 2011/65/EU	
MSL	Level 2	

Mechanical Specifications

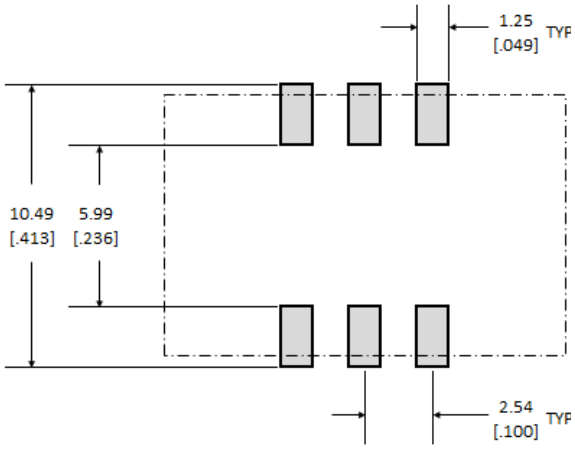
Pad termination finish: Gold flash < 10 µ inch, over Ni plated Cu



Dimension (mm)		
Symbol	Min	Max
A	-	14.9
B	-	9.7
C	-	7.0
D	0.9	1.1
E	1.6	1.8
F	0.9	1.1
G	2.54 nominal	
H	2.54 nominal	

Pad	Connection
1	Vc or N/C
2	N/C
3	Ground
4	Output
5	N/C
6	Vcc

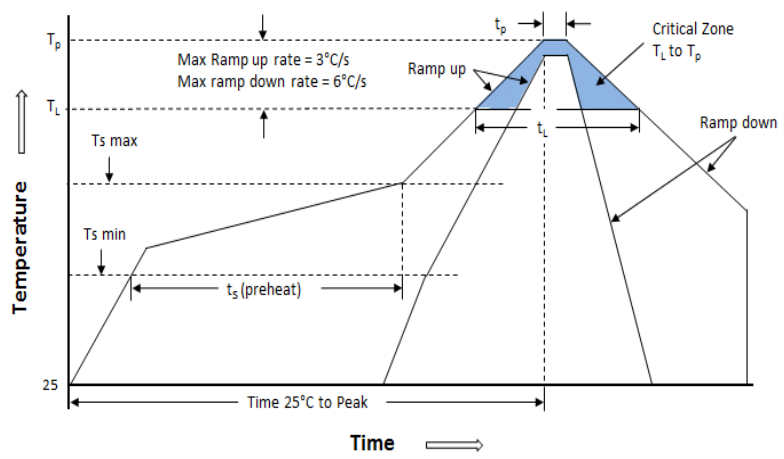
Recommended Solder Pad Geometry



All dimensions are mm [inches]
All dimensions are nominal

Marking Key	
**	Mfg site code
YYWWXXXXX	Serial Number (mfg date code = first 4 digits)

Solder Reflow



Ts max to TL(Ramp-up Rate)	3°C/s max
Preheat	
Temperature Min (Ts min)	150°C
Temperature typ (Ts)	175°C
Temperature max (Ts max)	200°C
Time (t_S)	60-120 seconds
Ramp-up Rate (T_L to T_P)	3°C/s max
Time maintained above:	
--Temperature (T_L)	217°C
--Time (t_L)	90 seconds max
Peak Temperature	245°C max for 10 seconds
Time within 5°C of peak (t_P)	20 seconds
Ramp-down Rate	6°C/s max
Time 25°C to Peak Temp (t)	8 minutes max

Note: Temperatures represent device body temperature.

Packing: Tape and Reel