

Model 139

Stratum 3E, Low Noise DIL OCXO

Features

- -170 dBc/Hz Phase Noise floor
- Compliant to Stratum 3E of GR-1244-Core
- 10 to 40MHz
- Surface Mount or Thru hole DIL Package
- 3.3V or 5.0V operation
- Tape and Reel Packaging (SMD)



Part Dimensions: 20.3 × 12.7 × 11.0 mm

Description

The CTS Model 139 is a low cost, small size, high performance OXCO. The high quality CTS Quartz Crystal used in this OXCO offers high stability and low jitter/phase noise, making it the ideal choice for any telecommunications system. Other applications include: Telecom Switching, Wireless Communication and Timing over Packet.

Ordering Information

Model	Stability	Temp Range	Supply Voltage	EFC	Package Style	Frequency																																			
139	<u>U</u>	<u>G</u>	<u>E</u>	<u>N</u>	<u>I</u>	<u>XXMXXX</u>																																			
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Part Number Example: 139UGENT20M000

Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
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Operating Conditions

Operating Temperature Range	See “Ordering Information” table for options.	-40	-	+85	°C
Supply Voltage (Vcc)	See “Ordering Information” table	3.135 4.75	3.3 5.0	3.465 5.25	Vdc
Power Consumption	During warm up	-	1.8	2.5	W
	Steady state @ 25°C	-	0.75	1.0	W
Load	Output to Ground	5	10	15	pF

Frequency Stability

Frequency	F _{NOM}	10	-	40	MHz
Calibration	$\Delta F/F_{NOM}$; T _A = 25°C; at time of shipment	-	±100	±200	ppb
Temperature Stability	(F _{max} - F _{min})/2 (See “Ordering Information” table for available stability options)	-	-	±10	ppb
Voltage Stability	V _{cc} ±5%	-	±2	±5	ppb
	Per day	-	±0.5	±1	ppb
Aging	Per year	-	-	±50	ppb
	10 years	-	-	±500	ppb
24-Hour Holdover Stability	Inclusive of operating temp and 24hours aging drift (Stability option W)	-	-	11	ppb, pk-pk
Total Free-Run Accuracy	Under all operating conditions for 10 years	-	-	±0.7	ppm
Drift (24 hours)	Constant temperature per GR-1244-CORE	-	-	±1	ppb
Short Term Stability ADEV (in still air)	1.0 sec	-	<0.01	0.02	ppb
	10 sec	-	0.01	0.03	ppb
Wander Generation	MTIE and TDEV per Stratum 3E requirements of Telcordia GR-1244-CORE				
Warmup-Up Time	T _A =25°C; to within 10ppb of freq. @ 30 min	-	-	5	minutes

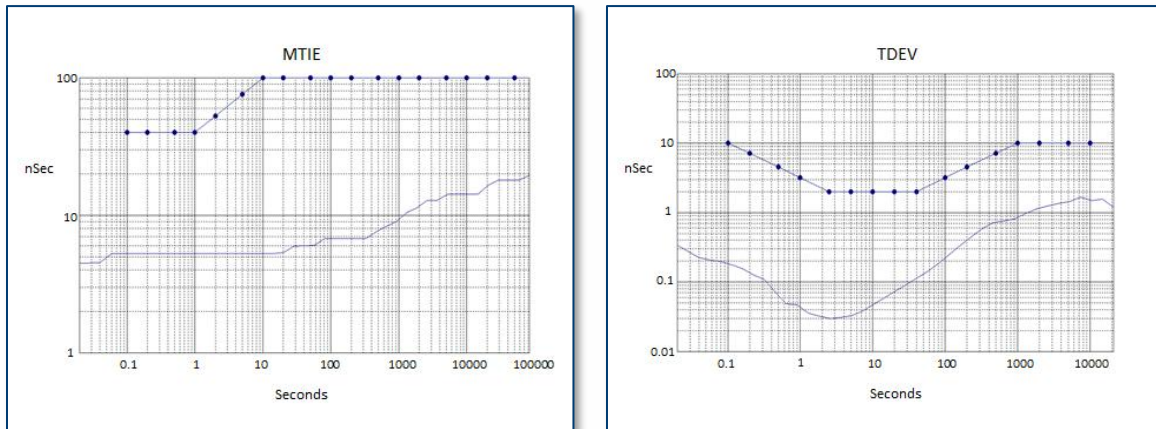
Electronic Frequency Control – EFC (option)

Voltage Range	V _C , Control voltage range	0	-	V _{cc}	V
Pulling Range	Sufficient for 10 years life	±0.7	±1.0	-	ppm
Linearity		-	-	10	%

Electrical Specifications (continued)

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
Output Parameters – Square Wave, HCMOS					
Waveform			HCMOS		
Amplitude	V_{OL} V_{OH}	- 0.9Vcc	- -	0.1Vcc -	Vdc
Rise / Fall Times	10% to 90% @ 10pf load	-	3	5	ns
Duty Cycle	@ 50% of output signal	45	50	55	%
Phase Noise (20MHz)	Offset = 10Hz	-	-112	-	dBc/Hz
	100Hz	-	-143	-	
	1KHz	-	-154	-	
	10KHz	-	-164	-	
	100KHz	-	-170	-	
Spurious		-	-	-70	dBc

Typical Stratum 3E Wander Generation performance per Telcordia GR-1244-CORE
(20 MHz, locked through a 0.001 Hz loop bandwidth)



Mechanical and Environmental

Parameter	Condition
Soldering	Maximum reflow temperature, 245°C for 10seconds, 240°C for 20seconds, per IPC/JEDEC J-STD-202D Note: Not intended for inverted reflow
MSL	Level 1
RoHS	Lead-Free. Fully compliant with RoHS Directive 2011/65/EU
Shock	500 G's, 1msec, 5 shocks in each of 6 directions
Sinusoidal Vibration	10Hz to 55Hz with a double amplitude of 1.5mm, 10g's peak from 55Hz to 2000Hz, for 30minutes in each of three perpendicular directions
Random Vibration	5.35G's RMS, 20 to 500Hz, per MIL-STD-202F, Method 214, 15minutes each axis
Seal	Hermetic
Marking Permanency	MIL-STD-202F, Method 215J
Packaging	Tape and Reel for Surface Mount Package; Bulk Pack in Foam for Thru-Hole Package
Storage Temperature Range	-55°C to +105°C

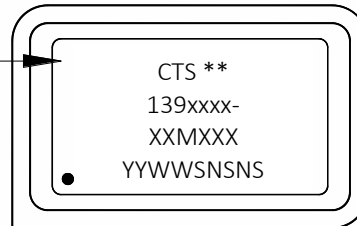
Mechanical Specifications

Figure 1 – Package Drawing – Surface Mount

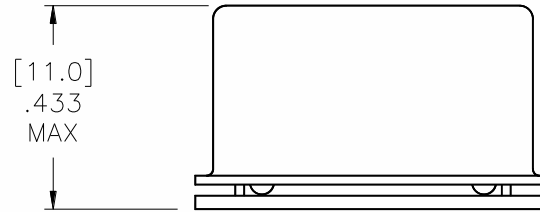
Pad termination finish: Gold flash < 10 μ inch, over Ni plated Cu

MARKING THIS SURFACE

- ** = MFG SITE CODE
- YYWW = DATE CODE
- XXXXXX = SERIAL NUMBER



PIN / PAD	FUNCTION
1	N/C or Vc
7	OV & CASE GROUND
8	OUTPUT
14	Vcc



KEY: [MM]
INCH

TOLERANCE: $[\pm .25]$
 $\pm .010$

$[\phi 1.09]$
 $\phi .043$ CASTELLATION
(4) PLACES

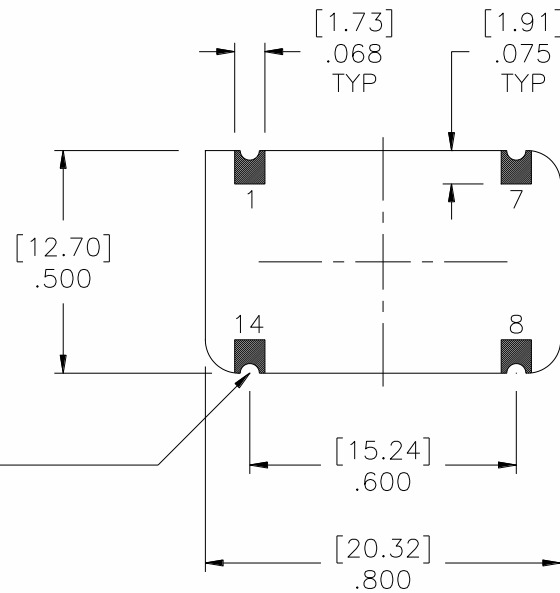
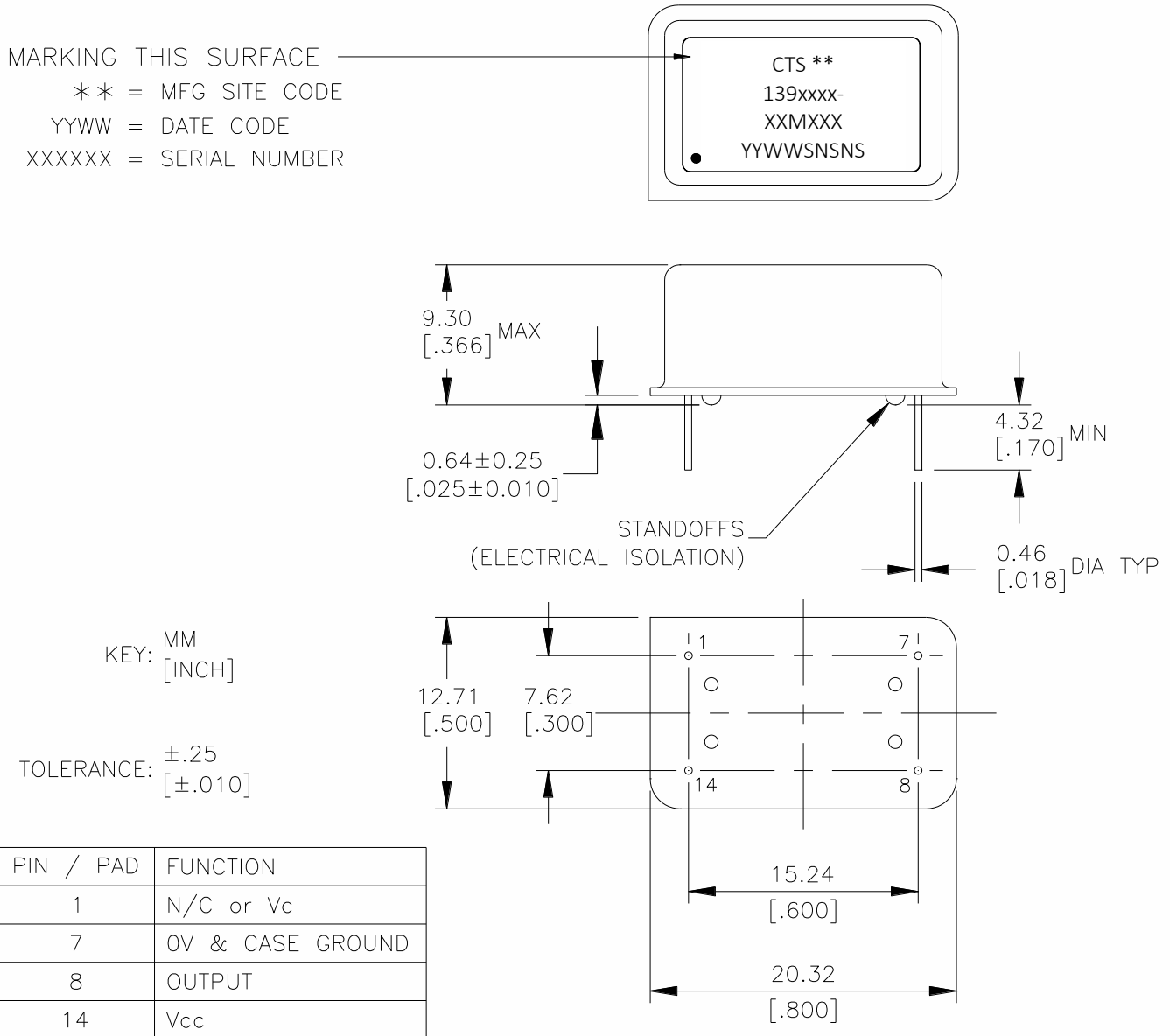
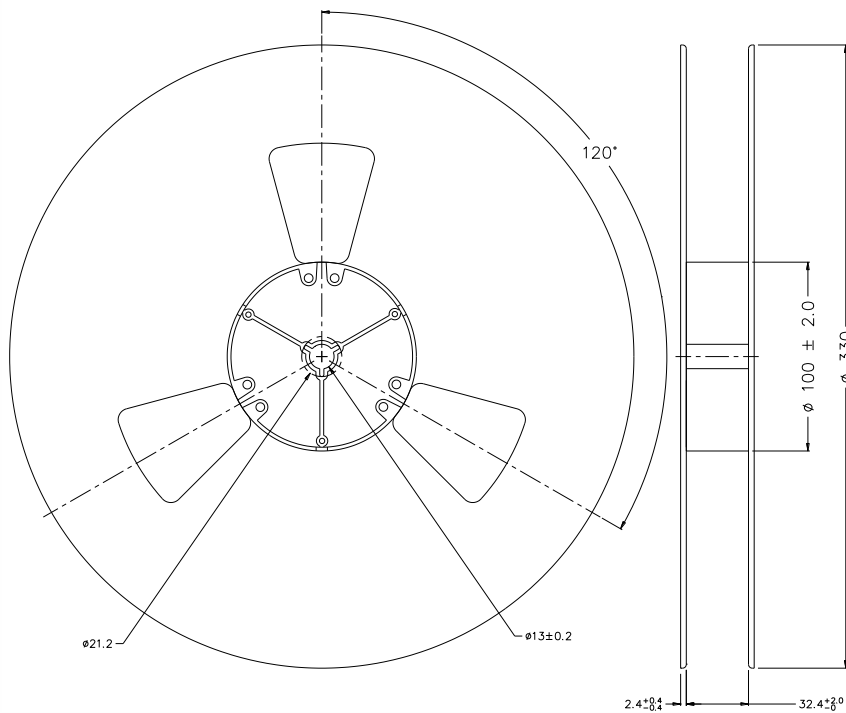
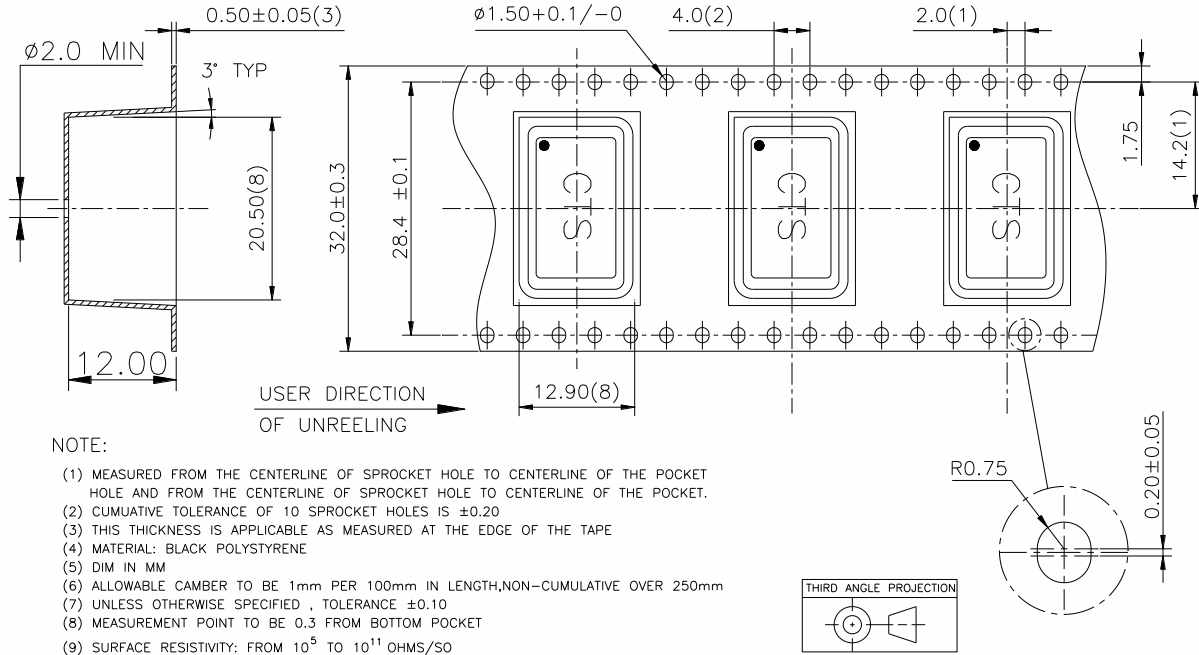


Figure 2 – Package Drawing – Through Hole

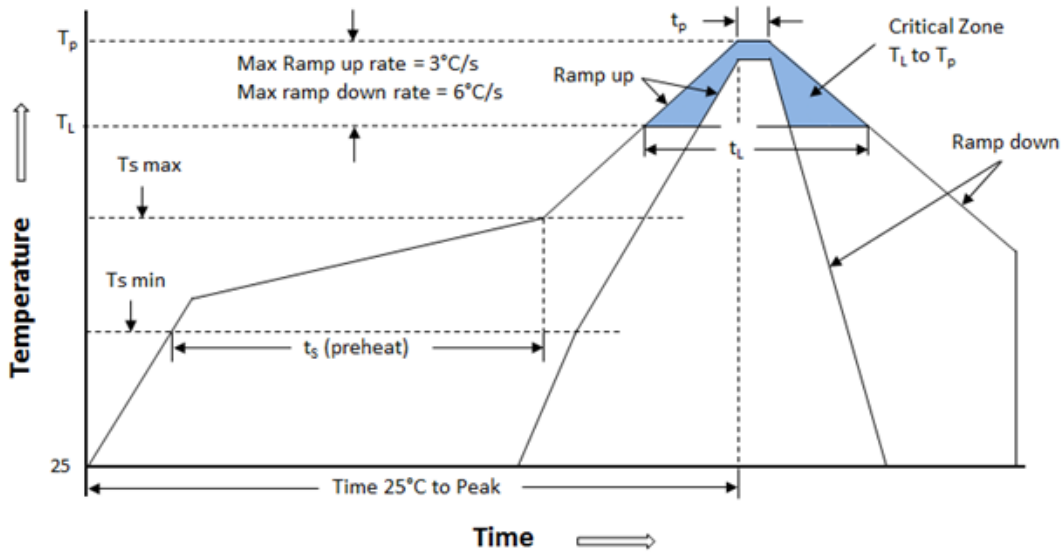
Lead Termination Finish: Solder Coated, Sn96.5% / Ag3.5%



Packing: Tape and Reel



Reflow profile per IPC/JEDEC J-STD-020D



Note: The temperatures shown below represent the device body temperature

$T_s \text{ max}$ to T_L (Ramp-Up Rate)	3°C/second max
Preheat:	
Temperature Min ($T_s \text{ Min}$)	150°C
Temperature Typical ($T_s \text{ Typ}$)	175°C
Temperature Typical ($T_s \text{ Max}$)	200°C
Time (t_s)	60-120 seconds
Ramp-Up Rate (T_L to T_p)	3°C/second max
Time Maintained Above:	
Temperature (T_L)	217°C
Time (T_L)	60-150seconds
Peak Temperature (T_p)	245°C max for 10 seconds
Time within 5°C of actual peak (T_p)	30 seconds
Ramp-Down Rate	6°C/second max
Time 25°C to Peak Temperature(T)	8 second max

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