

# Model 1380100-XXX

## 20 MHz, Stratum 3E OCXO

### Features

- Industry standard 20 x 12.7 mm SMT package
- Stratum 3E per GR-1244-CORE
- 3.3V operation
- Low Phase Noise
- Tape and Reel packaging

### Applications

- Telecom Switching
- Wireless Communication
- Timing over Packet



20 x 12.7 x 11 mm

### Description

The CTS model 1380100 is a low cost, small size, high performance OCXO. The high quality CTS Quartz Crystal used in this OCXO offers high stability and low jitter/phase noise, making it the ideal choice for any telecommunications system

### Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
<b>Operating Conditions</b>					
Operating Temperature Range		-40	-	+85	°C
Supply Voltage	3.3V	3.135	3.3	3.465	Vdc
Power Consumption	Warm up	-	1.8	2.5	W
	Steady state @ 25°C	-	0.75	1.0	
Load	Output to Ground	5	10	15	pf
<b>Frequency Stability</b>					
Frequency	$F_{NOM}$		20.000		MHz
Calibration	$\Delta F/F_{NOM}$ ; at time of shipment	-	±300	+500	ppb
Temperature Stability	See options table	-	7	10	ppb pk-pk
Voltage Stability	±5%	-	±1	±2	ppb
	Per day, at time of shipment	-	±0.5	±1	ppb/day
Aging	First year	-	-	±100	ppb
	10 years	-	-	±700	ppb
Holdover (24 hours)	Inclusive of operating temp and 24 hours aging drift – See Table 1	-	-	11	ppb pk-pk
Total Free-Run Accuracy	Under all conditions for 10 years	-	-	±2.5	ppm

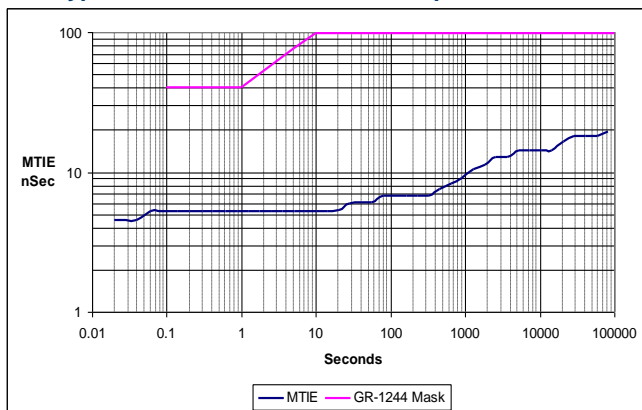
### Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
<b>Operating Conditions Continued</b>					
Drift	24 hours at constant temperature – See Table 1	-	-	±1	ppb
Short Term Stability ADEV (in still air)	1.0 sec	-	<0.01	0.02	ppb
	10 sec	-	0.01	0.03	
	100 sec	-	0.02	0.05	
	1000 sec	-	0.05	0.1	
	10,000 sec	-	0.07	0.2	
Wander Generation	MTIE and TDEV per Stratum 3E requirements per GR-1244-CORE				
Warm-Up Time	T <sub>A</sub> = 25°C; to within 10 ppb of frequency @ 30 minutes	-	-	5	minutes

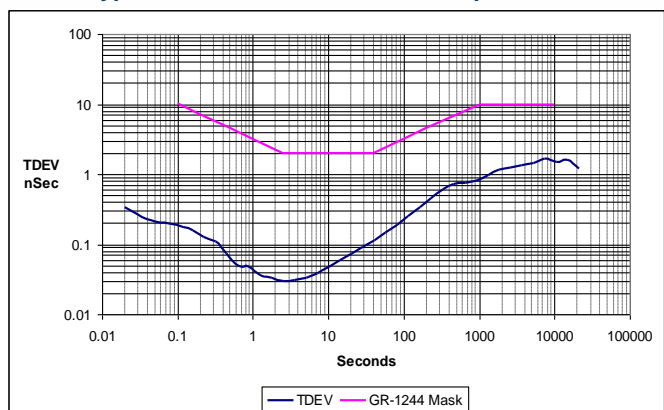
### Output Parameters – HCMOS

Amplitude	V <sub>OL</sub>	-	-	10% V <sub>CC</sub>	V
	V <sub>OH</sub>	90% V <sub>CC</sub>	-	-	
Rise / Fall Times	10% to 90% @ 10pf load	-	3	5	nsec
Duty Cycle	@ 50% of output signal	45	50	55	%
Spurious		-	-	-70	dBc
Phase Noise	Offset = 10Hz	-	-110	-	dBc/Hz
	100Hz	-	-130	-	
	1KHz	-	-140	-	
	10KHz	-	-148	-	

Typical Wander Generation MTIE performance



Typical Wander Generation TDEV performance



**Table 1 – Aging Recovery**

Time Off	Minimum power on time to recover daily aging rate
≤ 1 day	24 hours
< 1 week	3 days
< 1 month	6 days

### Options and Part Number

Dash No.	Package	Operating Temp. Range	Part Number
-001	SMT (Fig 1)	-20°C to +70°C	1380100-001
-002	SMT (Fig 1)	-40°C to +85°C	1380100-002
-003	Thru-Hole (Fig 2)	-20°C to +70°C	1380100-003
-004	Thru-Hole (Fig 2)	-40°C to +85°C	1380100-004

### Mechanical and Environmental

Soldering	Maximum reflow temperature, 245°C for 10 seconds, 240°C for 20 seconds, per IPC/JEDEC J-STD-020C
MSL	Level 1
RoHS	Lead-Free. Fully compliant to RoHS Directive 2011/65/EU
Shock	500 G's, 1msec, 5 shocks in each of 6 directions
Sinusoidal Vibration	10 Hz to 55 Hz with a double amplitude of 1.5 mm, 10 g's peak from 55 Hz to 2000Hz, for 30 minutes in each of three perpendicular directions
Random Vibration	5.35 G's RMS. 20 to 500 Hz, per MIL-STD-202F, Method 214, 15 minutes each axis.
Seal	Hermetic
Marking Permanency	Per MIL-STD-202F, Method 215J
Packaging	Tape and Reel for Surface Mount package; Bulk pack in foam for Thru-Hole package
Storage Temp Range	-40 to +85°C

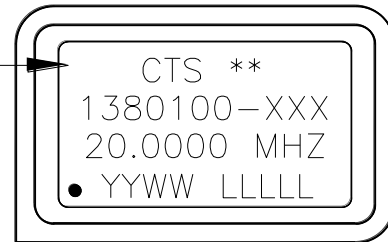
## Mechanical Specifications

Figure 1 – Package Drawing – Surface Mount

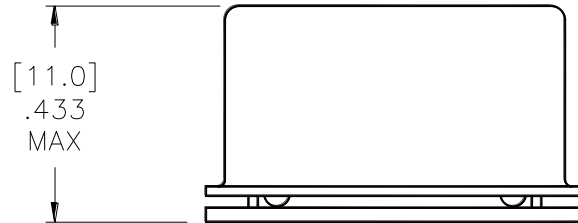
Pad termination finish: Gold Flash <10 micro inch, over Ni plated Cu

MARKING THIS SURFACE

- \*\* = MFG SITE CODE
- XXX = INSERT APPLICABLE DASH NUMBER
- YYWW = DATE CODE
- LLLLL = LOT CODE (OPTIONAL)



PIN / PAD	FUNCTION
1	N/C
7	0V & CASE GROUND
8	OUTPUT
14	Vcc



KEY: [MM]  
INCH

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

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

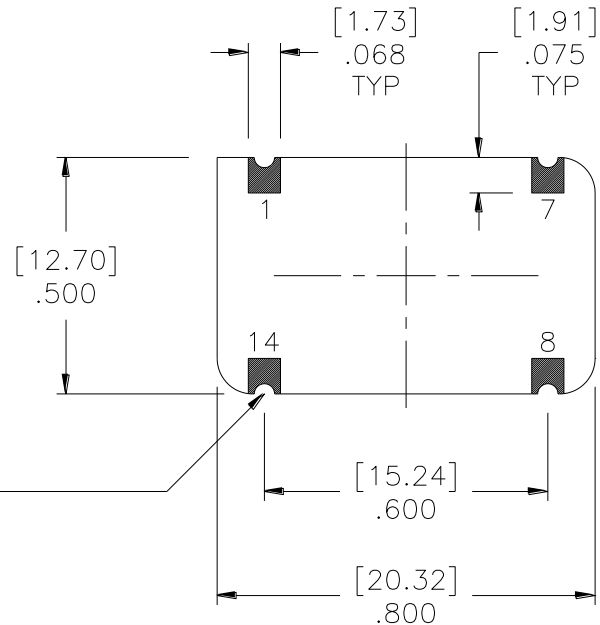
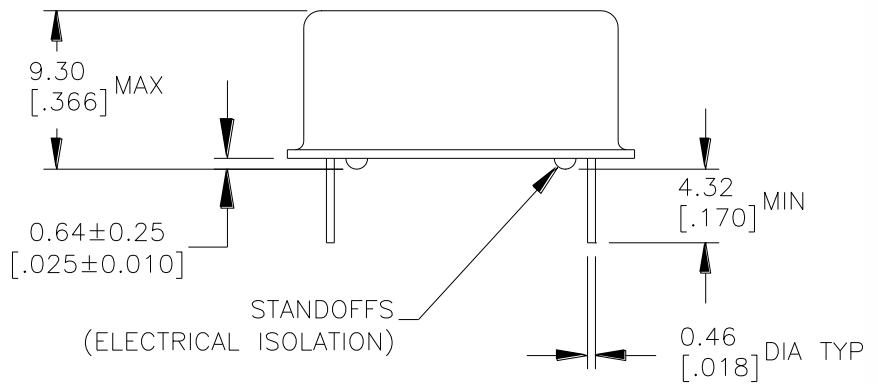
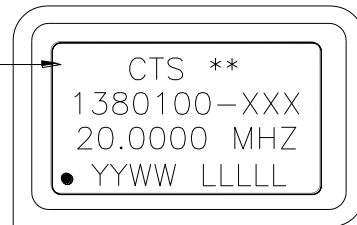


Figure 2 – Package Drawing – Thru Hole

Lead termination finish: Solder Coated, Sn96.5/Ag3.5

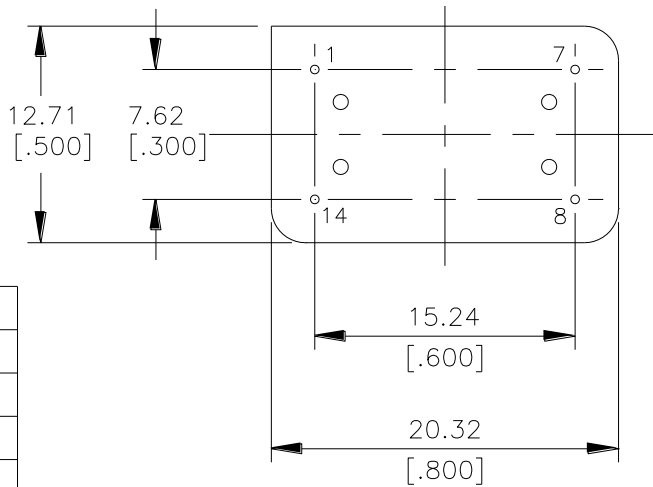
MARKING THIS SURFACE

- \*\* = MFG SITE CODE
- XXX = INSERT APPLICABLE DASH NUMBER
- YYWW = DATE CODE
- LLLLL = LOT CODE (OPTIONAL)



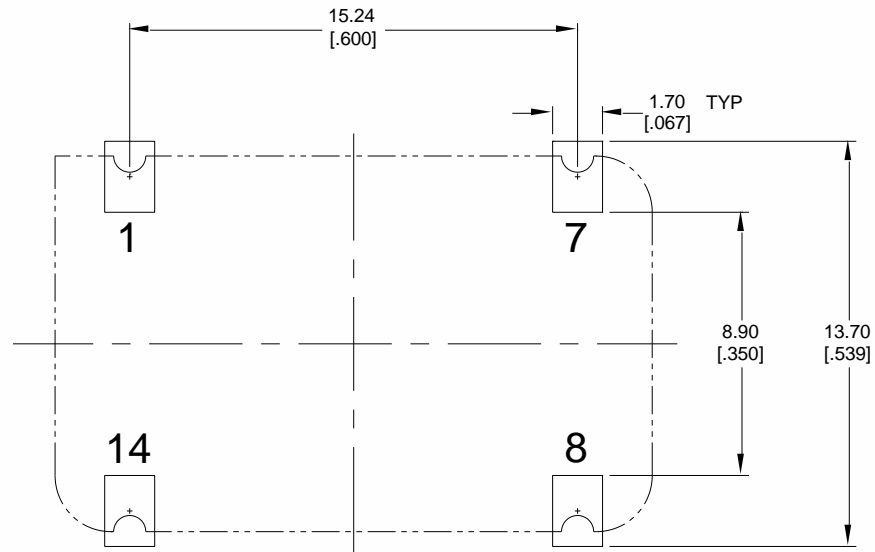
KEY: MM  
[INCH]

TOLERANCE: ±.25  
[±.010]

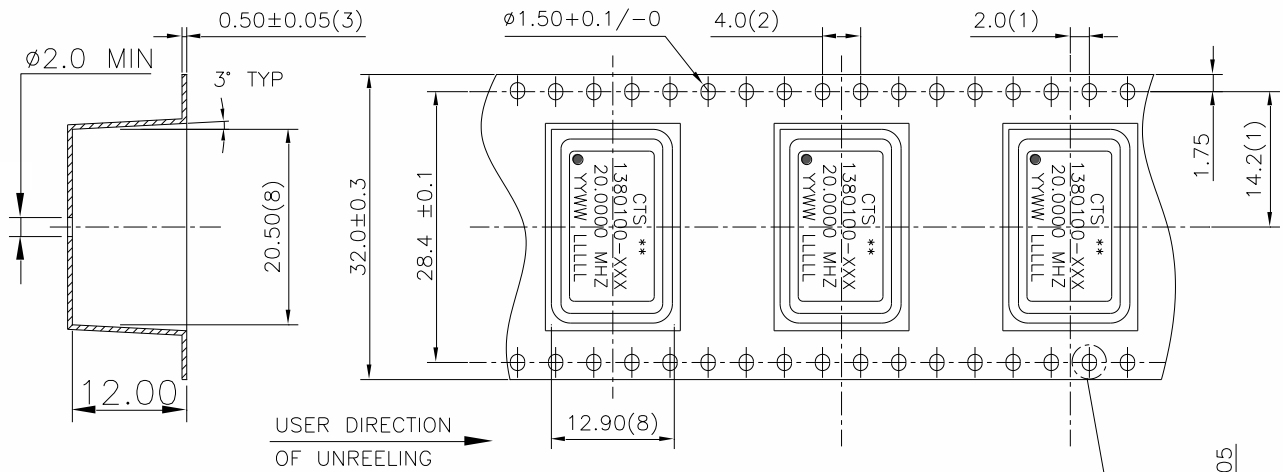


PIN / PAD	FUNCTION
1	N/C
7	0V & CASE GROUND
8	OUTPUT
14	Vcc

### Recommended Land Pattern

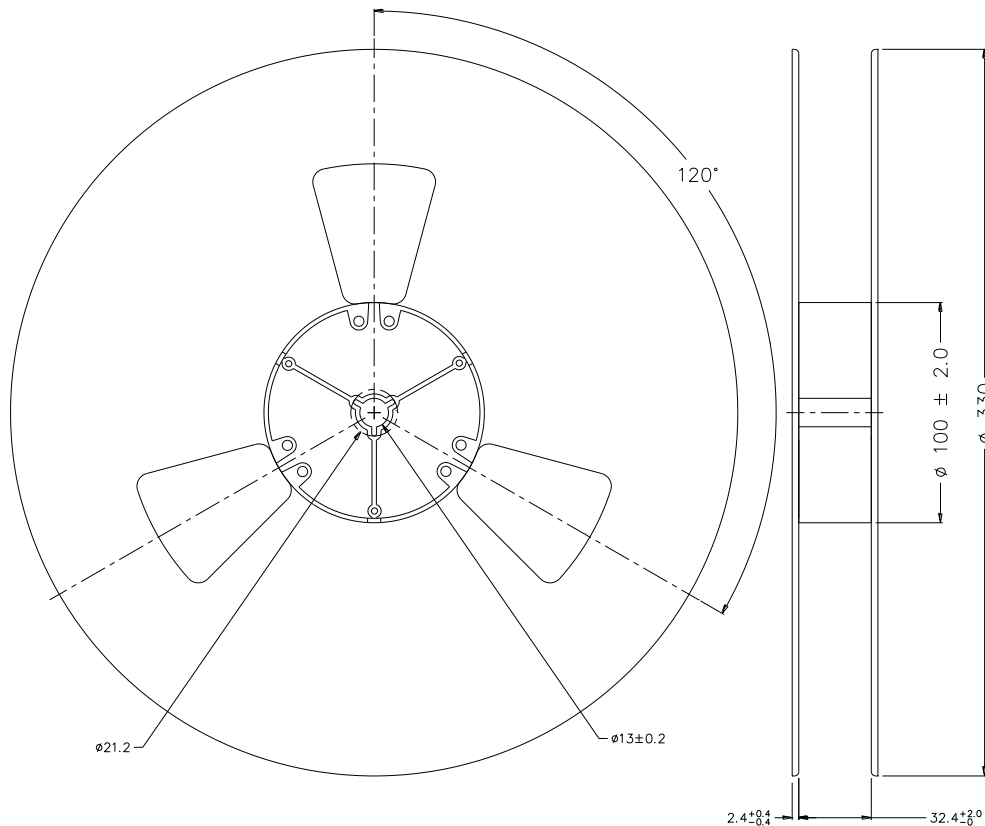


## Packing: Tape and Reel

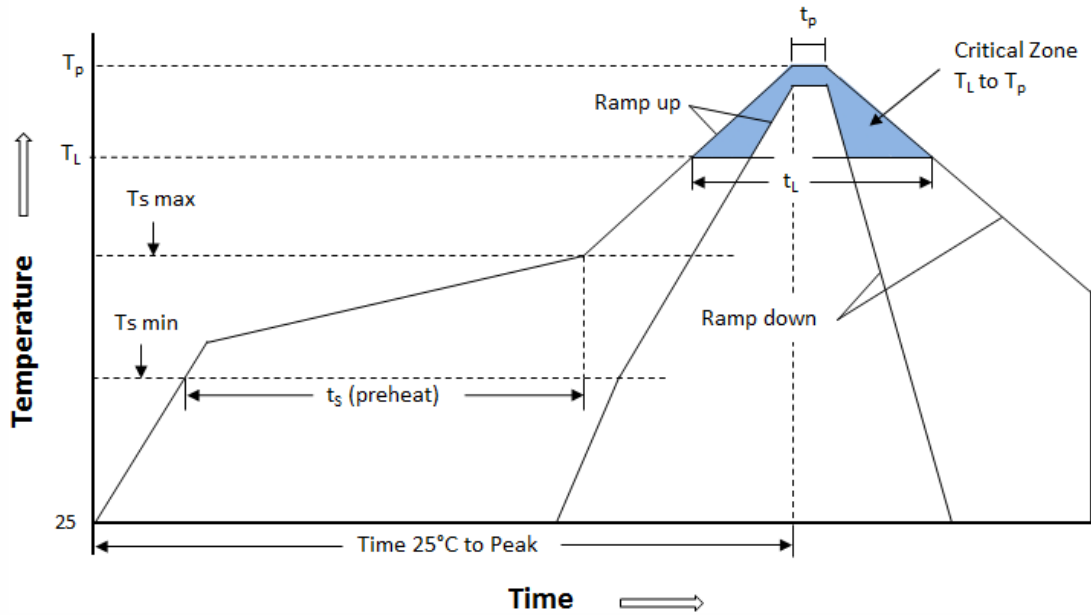


**NOTE:**

- (1) MEASURED FROM THE CENTERLINE OF SPROCKET HOLE TO CENTERLINE OF THE POCKET HOLE AND FROM THE CENTERLINE OF SPROCKET HOLE TO CENTERLINE OF THE POCKET.
- (2) CUMULATIVE TOLERANCE OF 10 SPROCKET HOLES IS  $\pm 0.20$
- (3) THIS THICKNESS IS APPLICABLE AS MEASURED AT THE EDGE OF THE TAPE
- (4) MATERIAL: BLACK POLYSTYRENE
- (5) DIM IN MM
- (6) ALLOWABLE CAMBER TO BE 1mm PER 100mm IN LENGTH, NON-CUMULATIVE OVER 250mm
- (7) UNLESS OTHERWISE SPECIFIED, TOLERANCE  $\pm 0.10$
- (8) MEASUREMENT POINT TO BE 0.3 FROM BOTTOM POCKET
- (9) SURFACE RESISTIVITY: FROM  $10^5$  TO  $10^{11}$  OHMS/SO



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



Note: The temperatures shown below represent the device body temperature

Ts max to T <sub>L</sub> (Ramp-up Rate)	3°C/second max
Preheat	
Temperature Min(Ts Min)	150°C
Temperature Typical( Ts Typ)	175°C
Temperature Max.(Ts Max)	200°C
Time(ts)	60-180 seconds
Ram-up Rate(T <sub>L</sub> to T <sub>p</sub> )	3°C/second max
Time Maintained Above:	
--Temperature(T <sub>L</sub> )	217°C
--Time(T <sub>L</sub> )	60-150seconds
Peak Temperature (T <sub>p</sub> )	245°C max for 10 seconds
Time within 5°C of actual peak(t <sub>p</sub> )	20 seconds
Ramp-down Rate	6°C/second max
Tune 25°C to Peak Temperature(t)	8 minutes max