

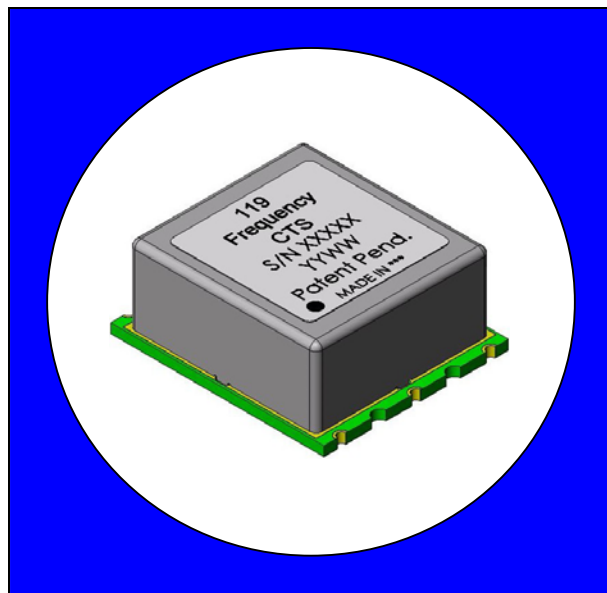
### FEATURES

- Industry Standard 22 x 25.4mm SMT package
- 10 to 26 MHz
- 3.3V or 5.0V operation
- Commercial or Industrial Temperature Range
- LVCMOS or HCMOS Square Wave Output
- Optional Sine Wave Output
- Low Phase Noise
- Optional Voltage Control
- Optional Reference Voltage
- Optional Enable Function
- Tape and Reel Packaging
- Fully compliant to RoHS Directive 2002/95/EC

### DESCRIPTION

The CTS model 119 is a low cost, small size, high performance OCXO. The high quality CTS Quartz Crystal used in this OCXO offers high stability and extremely low phase noise, making it the ideal choice for any telecommunications system. Patent Pending.

**Applications:** Telecom Switching  
Wireless Communication



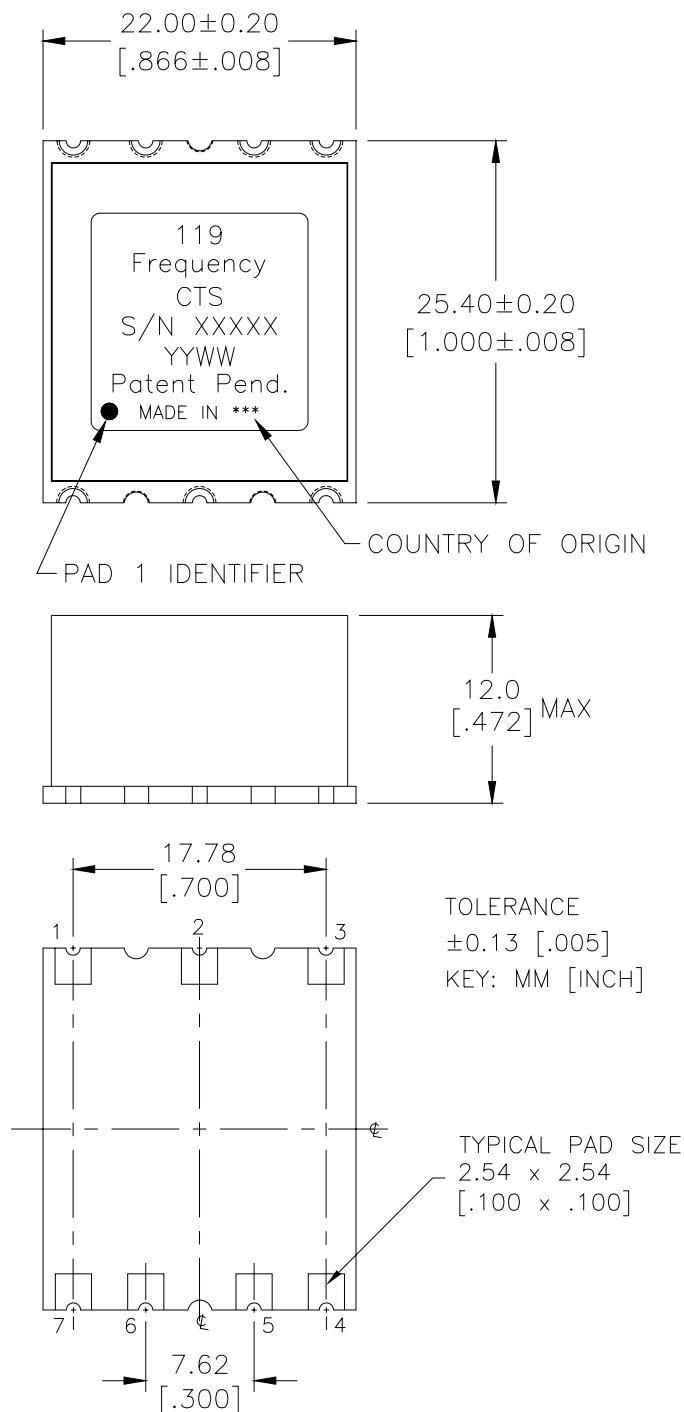
### ELECTRICAL SPECIFICATIONS

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
<b>Operating Conditions</b>					
Operating Temperature Range	T <sub>OP</sub>	-40	-	85	°C
Supply Voltage (Vcc)	3.3V – Standard	3.135	3.3	3.465	Vdc
	5.0 V- Available	4.75	5.0	5.25	Vdc
Power Consumption	during warm up	-	-	4	W
	steady state @ 25°C	-	-	1.5	W
Load - Square Wave	Output to Ground	5	10	15	pf
Load - Sine Wave	Output to Ground	45	50	55	ohms
<b>Frequency Stability</b>					
Standard Frequencies	f <sub>NOM</sub>	10	10, 12.8, 13, 16.384, 19.44, 20, 25.6, 26	26	MHz
Calibration	Δf/f <sub>NOM</sub> ; T <sub>A</sub> =25°C; at time of shipment @ 0.5 X Vc	-	-	± 200	ppb
vs Temperature	0° to 70°C; ref. 25°C Standard	-	-	±10	ppb
	-40° to 85°C; ref. 25°C Available	-	-	±20	ppb
vs Supply Voltage	± 5%	-	-	± 5	ppb
vs Load	± 10%	-	-	± 1	ppb
Aging	at time of shipment	-	-	± 1	ppb/day
	first year	-	-	± 100	ppb/year

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
<b>Frequency Stability continued</b>					
Short Term Stability Allan Deviation	In Still Air @ 0.1 sec tau	-	-	0.01	ppb
	In Still Air @ 1.0 sec tau	-	-	0.01	ppb
Warm-Up Time	T <sub>A</sub> =25°C; to within 50ppb of freq. @ 30 min	-	-	4	minutes
<b>Phase Noise (For 10 MHz)</b>					
	10 Hz	-	-125	-	dBc/Hz
	100 Hz	-	-140	-	dBc/Hz
	1 kHz	-	-150	-	dBc/Hz
	10 kHz	-	-155	-	dBc/Hz
<b>Spurious</b>					
		-	-	-70	dBc
<b>Electronic Frequency Control</b>					
Input Impedance	Z <sub>i</sub>	10	-	-	kΩ
Modulation Bandwidth	-3dB	500	-	-	Hz
Control Voltage Range	V <sub>C</sub> ; positive monotonic transfer	0	-	V <sub>CC</sub>	Vdc
Tuning Range		±0.7	-	-	ppm
Tuning Coverage		15	-	-	years
Linearity		-	-	±10	%
<b>Output Parameters</b>					
<b>Output Signal Square Wave</b>		LVCMOS or HCMOS			
Amplitude	V <sub>OL</sub>	-	-	10%V <sub>CC</sub>	Vdc
	V <sub>OH</sub>	90% V <sub>CC</sub>	-	-	
Rise / Fall Times	10% to 90% @ 10pf load	-	-	7	ns
Duty Cycle	@ 50 % of output signal	45	50	55	%
<b>Output Signal Sine Wave (Optional)</b>		Sine Wave			
Amplitude	Sine Wave into 50 Ohm	2	5	8	dBm
Harmonics		-	-	-35	dBc
<b>Reference Voltage (optional) Pad 2</b>					
	For V <sub>CC</sub> @ 3.3 Vdc; 4 ma Max	2.70	2.80	2.90	Vdc
	For V <sub>CC</sub> @ 5.0 Vdc; 4 ma Max	3.85	4.00	4.15	Vdc
<b>Enable Function (optional) Pad 2</b>					
Enable Function	For V <sub>CC</sub> = 3.3V or 5.0V				
Enable Input Voltage	Logic '1', Output Enabled	.9V <sub>CC</sub>	-	-	Vdc
Disable Input Voltage	Logic '0', Output Disabled	-	-	.1V <sub>CC</sub>	Vdc
Open	Floating, Output Enabled	-	-	-	-

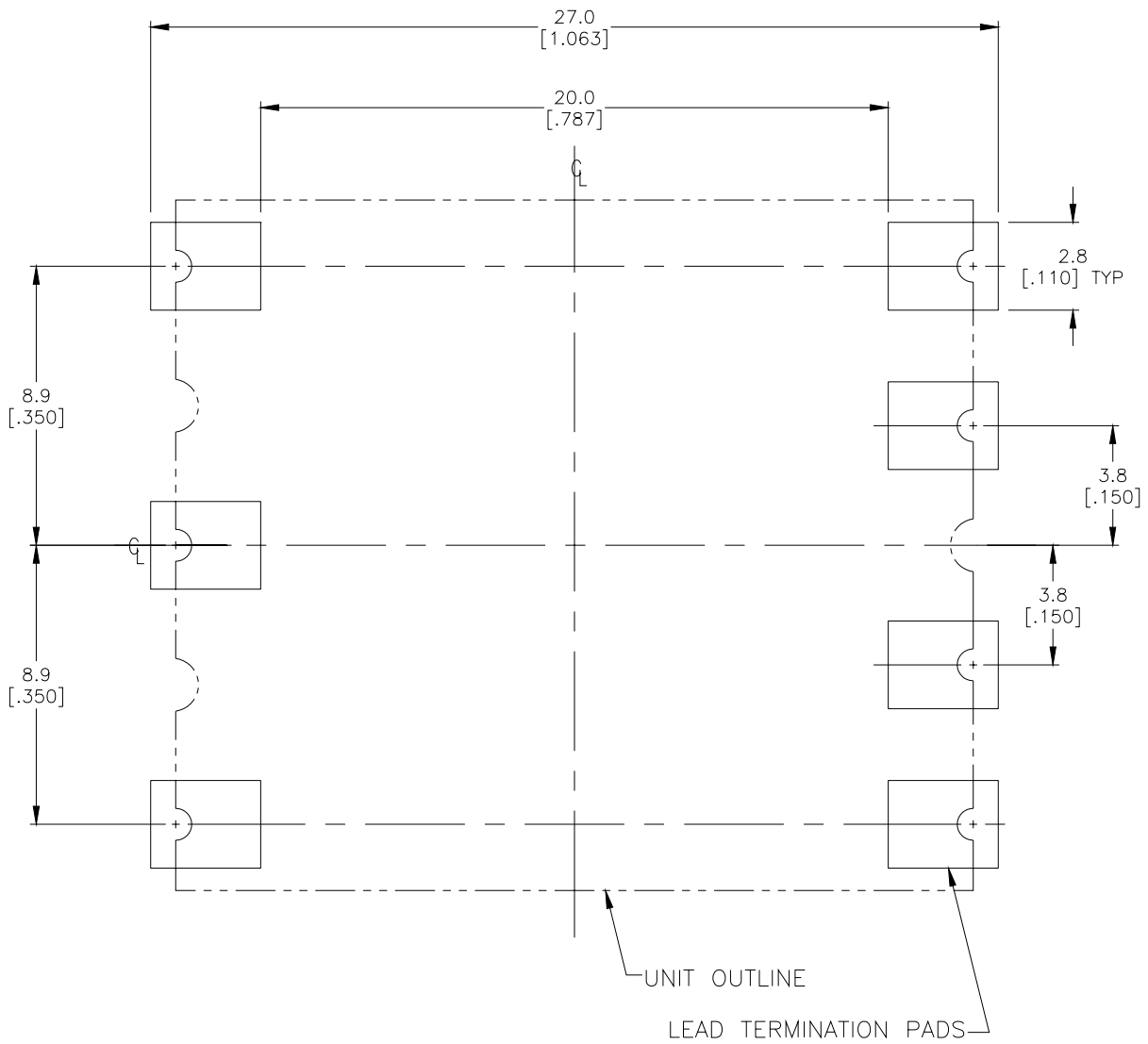
<b>Mechanical</b>	
Soldering	Maximum reflow temperature, 245°C for 10 seconds, 240°C for 20 seconds, per IPC/JEDEC J-STD-020C
MSL	Level 1
Shock :	500 G's 1 ms, Halfsine, 3 shock per direction, per MIL-STD-202F, Method 213B, Test Condition D.
Sinusoidal Vibration :	0.06" D.A. or 10 G's Peak, 10 to 500 Hz, per MIL-STD-202F, Method 204D, Test Condition A.
Random Vibration :	5.35 G's RMS. 20 to 200 Hz, per MIL-STD-202F, Method 214, Test Condition 1A, 15 minutes each axis.
Seal :	Non hermetic
Marking Permanency :	per MIL-STD-202F, Method 215J.
Attachment Method :	SMT
Storage Temperature Range:	-55°C to +125°C

### MECHANICAL SPECIFICATIONS PACKAGE DRAWING



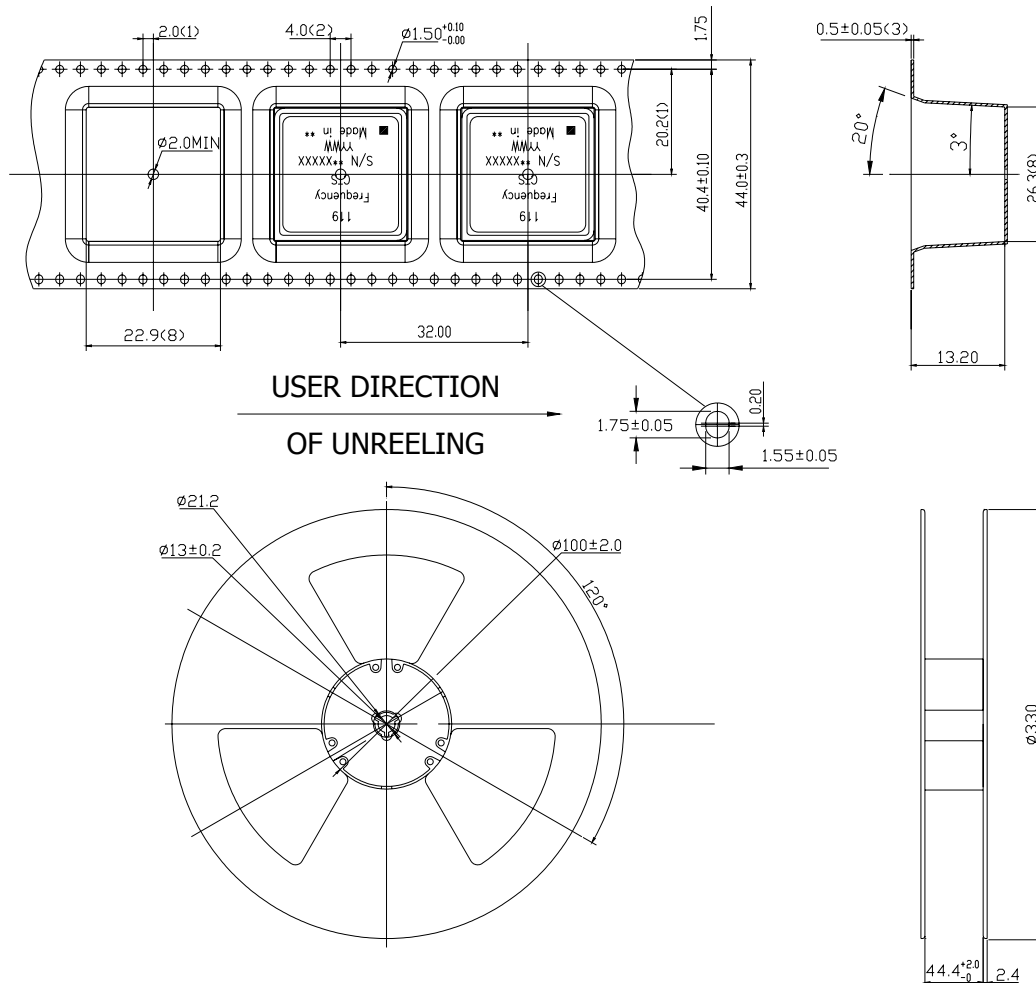
PAD	FUNCTION
1	Control Voltage – Vc or N/C
2	Ref Voltage or Enable or N/C
3	Supply Voltage – Vcc
4	RF Output
5	N/C
6	N/C
7	Ground/Case

LEAD TERMINATION FINISH: GOLD FLASH, <10 MICRO INCH, OVER Ni PLATED Cu.



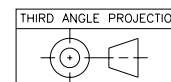
RECOMMENDED LAND PATTERN  
 ALL DIMENSIONS ARE NOMINAL  
 KEY: MM [INCH]

### Packing: Tape and Reel



**NOTES:**

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 ABOVE THE INDICATED POINT.
9. SURFACE RESISTIVITY: FROM  $10^5$  TO  $10^9$  OHMS/SQ
10. MAXIMUM QUANTITY 50 UNITS IN ONE TAPE&REEL
11. UNITS: MM



**Table 1**

Generate CTS part number for standard options. ( See factory representative for other requirements.)							
Model	Temperature Range	Supply Voltage	Output Waveform	Electronic Frequency Control	Ref. Voltage or Enable	Frequency Code	
119						-	M

Code	Specification
A	0°C to +70°C
B	-40°C to +85°C

Code	Specification
V	EFC
N	No EFC

Code	Specification
5	5V +/- 5%
3	3.3V +/- 5%

Code	Specification
R	Reference Voltage
E	Enable
N	None Above

Code	Specification
H	HCMOS
S	Sine

Code	Frequency
10M000	10.000 MHz
12M800	12.800 MHz
13M000	13.000 MHz
16M384	16.384 MHz
19M440	19.440 MHz
20M000	20.000 MHz
25M600	25.600 MHz
26M000	26.000 MHz

Part Number Example: 119B3HVR-16M384