

# TF Type

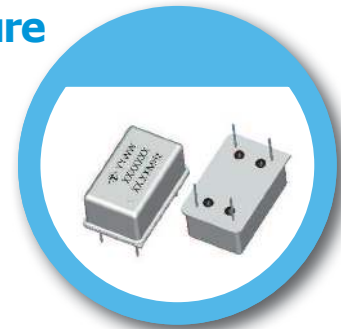
## 20.4 x 12.8 mm Voltage Controlled Temperature Compensated Crystal Oscillator

### FEATURE

- Typical 20.4 x 12.8 x 7.8 mm.
- Hermetically Sealed 14 Pin DIP Package
- Double sealed metal case and high reliability
- VCTCXO available

### TYPICAL APPLICATION

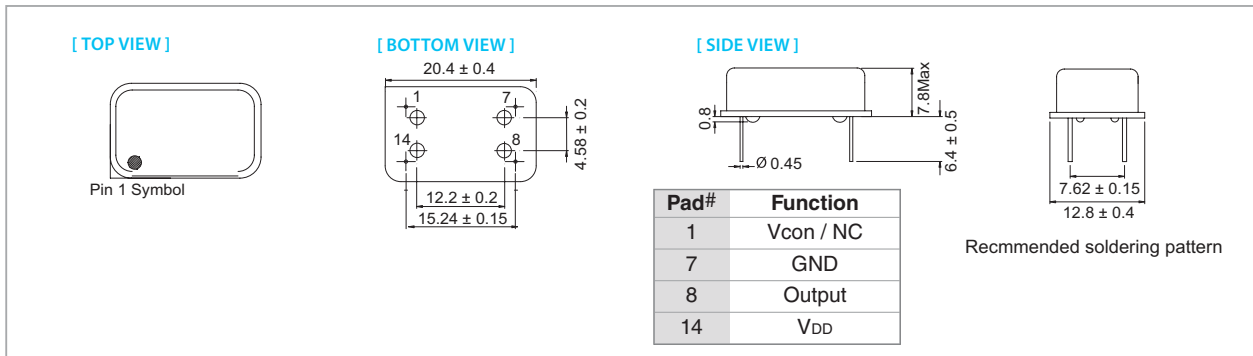
- Large-Scale equipment
- WLAN/WiMAX
- Military Communication Equipmet



**RoHS Compliant**

### DIMENSION (mm)

### SOLDER PAD LAYOUT (mm)



### ELECTRICAL SPECIFICATION

Parameter	Clipped Sine Wave				CMOS				Unit
	3.3 V		2.8 V		3.3 V		2.8V		
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
<b>Supply Voltage Variation (VDD) ±5%</b>	3.135	3.465	2.66	2.94	3.135	3.465	2.66	2.94	V
<b>Frequency Range</b>	10	52	10	52	1.25	52	1.25	52	MHz
<b>Frequency Tolerance*</b>	-	±2.0	-	±2.0	-	±2.0	-	±2.0	ppm
<b>Frequency Stability</b>									
Vs Supply Voltage (±5%) change	-	±0.2	-	±0.2	-	±0.2	-	±0.2	ppm
Vs Load (±10%) change	-	±0.2	-	±0.2	-	±0.2	-	±0.2	ppm
Vs Aging (@ 1st year)	-	±1.0	-	±1.0	-	±1.0	-	±1.0	ppm
<b>Supply Current</b>									
10 MHz ≤ Fo < 15 MHz	-	2.0	-	2.0	Only for clipped sine wave				mA
15 MHz ≤ Fo < 26 MHz	-	3.0	-	3.0					
26 MHz ≤ Fo ≤ 52 MHz	-	4.0	-	4.0					
<b>Output Level</b>	0.8	-	0.8	-					Vp-p
<b>Supply Current</b>									
1.25 MHz ≤ Fo < 10 MHz	Only for CMOS				-	10	-	7	mA
10 MHz ≤ Fo < 15 MHz					-	15	-	10	
15 MHz ≤ Fo < 26 MHz					-	20	-	15	
26 MHz ≤ Fo ≤ 52 MHz					-	25	-	20	
<b>Output Level</b>									
Output High (Logic"1")					2.97 or 2.4	-	2.52 or 2.4	-	V
Output Low (Logic"0")					-	0.33 or 0.4	-	0.28 or 0.4	
Duty					40	60	40	60	
<b>Control Voltage Range (VCTCXO)</b>	0.5	2.5	0.5	2.5	0.5	2.5	0.5	2.5	V
<b>Pulling Range (VCTCXO)</b>	±5.0	-	±5.0	-	±5.0	-	±5.0	-	ppm
<b>VC Input Impedance (VCTCXO)</b>	100	-	100	-	100	-	100	-	kΩ
<b>Phase noise @ 13.0 MHz</b>									
100 Hz	-115		-115		-115		-115		dBc/Hz
1 kHz	-135		-135		-135		-135		
10 kHz	-148		-148		-148		-148		
<b>Start Time</b>	-	2	-	2	-	2	-	2	mSec
<b>Storage Temp. Range</b>	-55	125	-55	125	-55	125	-55	125	°C

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.

\*Frequency at 25°C, 1 hour after reflow.

### FREQ. STABILITY vs. TEMP. RANGE

Output Logic	Clipped sine wave		CMOS	
	±0.5	±1.0	±0.5	±1.0
Temp. (°C)	ppm			
-20 ~ +70	○"	○	○"	○
-40 ~ +85	△"	○	△"	○

\* ○ : Available △:Conditional X: Not available

" Pulling Range < 10 ppm available

**Note: not all combination of options are available. Other specifications may be available upon request.**

Specifications subject to change without notice.