



# BT1657T SERIES TCXO

BROOKDALE FREQUENCY CONTROLS, INC.



### FEATURES:

- 5.0 X 7.0 X 2.5MM CERAMIC SMD TCXOS
- HCMOS SQUARE WAVE OUTPUT
- NO MECHANICAL TRIMMER FOR AQUEOUS WASHING
- **RoHS Compliant: Pb Free**
- **REQUEST A CERTIFICATE OF CONFORMANCE**
- 0.01 UF DECOUPLING CAPACITOR BUILT-IN
- WIDE FREQUENCY RANGE: 1.0 MHZ TO 156.0 MHZ
- FREQUENCY STABILITY AS TIGHT AS  $\pm 0.5$  PPM AVAILABLE
- -40 TO +85°C TEMPERATURE RANGE AVAILABLE
- **REQUEST A QUOTE ON THIS DEVICE**

### BT1657T TCXO SERIES SPECIFICATION SHEETS

Frequency Range		1.0 MHz ~ 156.0 MHz						
Output Wave from		Square wave HCMOS						
Initial Calibration Tolerance <sup>(1)</sup>		$\pm 2$ ppm at +25°C $\pm 2^\circ\text{C}$ and $V_{\text{con}} = +1.5\text{VDC}$						
Frequency Stability		$\pm 0.5$ ppm	$\pm 1.0$ ppm	$\pm 1.5$ ppm	$\pm 2.0$ ppm	$\pm 2.5$ ppm		
TEMPERATURE RANGE	0°C to +50°C	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	
	-10°C to +60°C	CALL US	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	
	-20°C to +70°C	Not Available	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	
	-30°C to +75°C	Not Available	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	
	-40°C to +85°C	Not Available	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE	
FREQUENCY STABILITY	VS. AGING	$\pm 1.0$ ppm max. first year at +25°C						
	Vs. VOLTAGE CHANGE	$\pm 0.3$ ppm max. for a $\pm 5\%$ input voltage change						
	Vs. LOAD CHANGE	$\pm 0.3$ ppm max. for a $\pm 10\%$ loading condition change						
	Vs. REFLOW	$\pm 1$ ppm max. 1 reflow and measured 24 hours afterwards						
Supply Voltage ( $V_{\text{DD}}$ )		+2.8VDC	+3.0VDC	+3.3VDC	+5VDC			
Current Consumption (typical)		2 mA @ 8.192MHZ 3 mA @ 10 MHz 14 mA @ 77.760 MHz 26 mA @ 155.520 MHz	2mA @ 8.192MHZ 4 mA @ 10 MHz 17 mA @ 77.760 MHz 35 mA @ 155.520 MHz	5 mA @ 8.192MHZ 7 mA @ 10 MHz 32 mA @ 77.760 MHz 50 mA @ 155.520 MHz				
Output Voltage Range	Logic High "1"	90% ( $V_{\text{DD}}$ ) min.						
	Logic Low "0"	10% ( $V_{\text{DD}}$ ) max.						
Duty Cycle		50% $\pm 10\%$ measured @ 50% $V_{\text{DD}}$						
Rise Time and Fall Time		10 ns max. 20% $\leftrightarrow$ 80% of waveform						
Start-Up Time.		10ms max.						
Output Load		15 pF						
SSB Phase Noise At 25°C	Offset	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	5 MHz
	3.3V-10.000MHZ	-93dBc/Hz	-117dBc/Hz	-137dBc/Hz	-144dBc/Hz	-144dB/Hz	-151dBc/Hz	-152dBc/Hz
	3.3V-155.520MHZ	-62dBc/Hz	-88dBc/Hz	-111dBc/Hz	-121dBc/Hz	-116dBc/Hz	-107dBc/Hz	-122dBc/Hz
Green Requirement		RoHS Compliant, Pb Lead Free						
MSL Level		MSL 1 per IPC/JEDEC-STD-020C						
Humidity		85% RH, 85°C, 48 Hours						
Solderability		MIL-STD-202F method 208E						
Vibration		MIL-STD-202F method 204, 35G, 50 to 2000Hz						
Shock		MIL-STD-202F method 213B, test conditions E, 1000GG 1/2sine wave						
Storage temperature range		-55 to +125°C						
Solderability		MIL-STD-202F method 208E						

### PART NUMBER GUIDE

Model	Voltage	Stability	Operating Temperature (°C)	Frequency
BT1657T	2 = 2.8V	1 = $\pm 1$ ppm	A = 0°C to 50°C	
	3 = 3.0V	15 = $\pm 1.5$ ppm	B = -10°C to 60°C	
	33 = 3.3V	2 = $\pm 2$ ppm	C = -20°C to 70°C	
	5 = 5.0V	25 = $\pm 2.5$ ppm	D = -30°C to 75°C	
		5 = $\pm 0.5$ ppm	M = -40°C to 85°C	

### EXAMPLE

BT1657T	3	1	A	50.000 MHz
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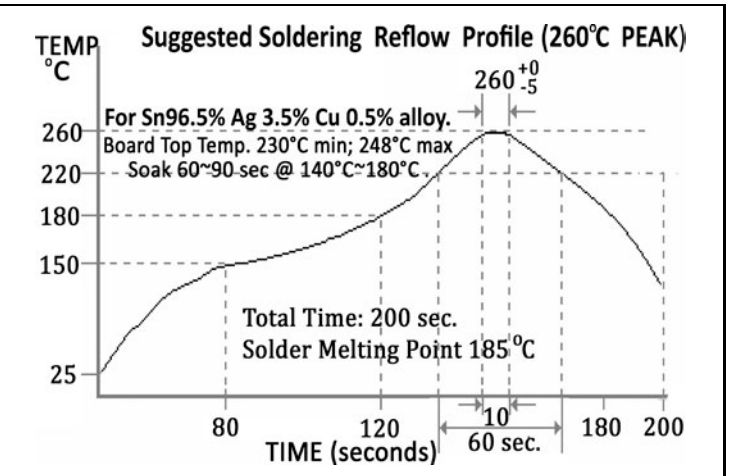
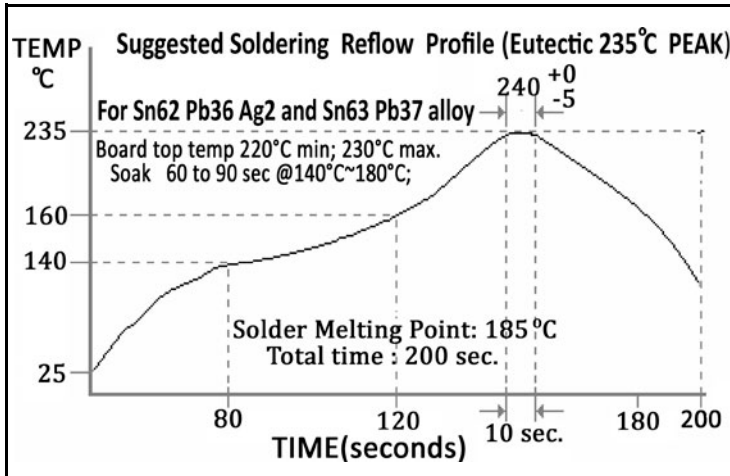
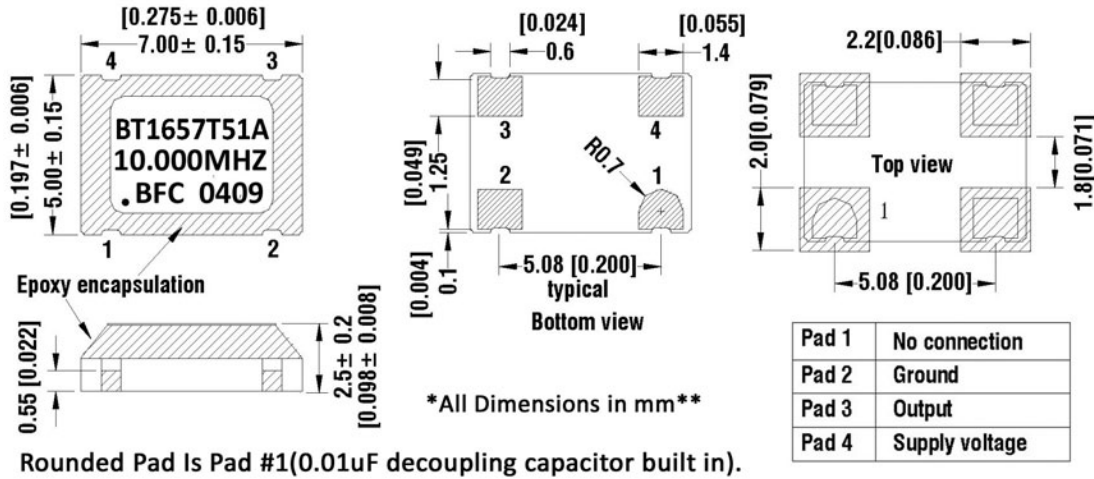


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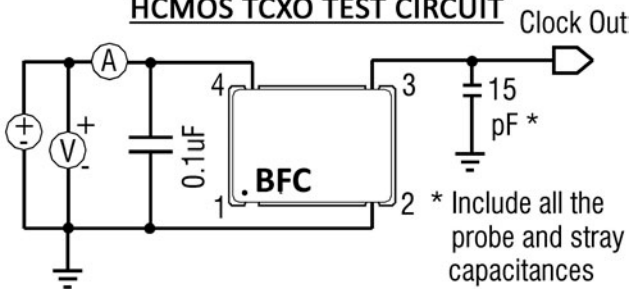
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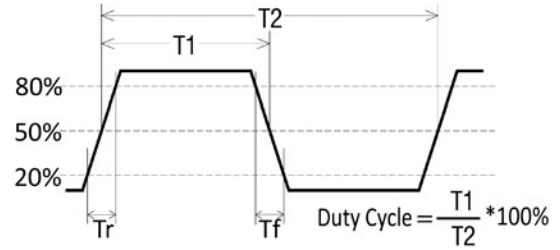
## MECHANICAL DIMENSIONS AND LAND PATTERN



### HCMOS TCXO TEST CIRCUIT



### HCMOS OUTPUT WAVEFORM



### PHASE NOISE (dBc/Hz)

