GREENRAY
frequency control solutions

T70

TIGHT TEMPERATURE STABILITY
RUGGED PACKAGE

tcxo

Product Description

Greenray Industries' T70 Series TCXOs offers +5V operation, precision performance for mobile, battery-powered apps. It has been developed as a reference oscillator for critical timing applications that require tight temperature stability, low supply current, a very rugged package, and a small footprint. The T70 Series is well-suited to use in exploration and tracking equipment applications.

Features

- Small and rugged 7.0 x 5.0 mm package
- Withstand vibration, and high shock up to 50,000 g
- Tight temperature stability as low as ±0.1ppm
- Excellent long-term aging < 5ppm over 10 years
- Low acceleration sensitivity: < 0.7 ppb/g
- Low power consumption, enable reliable, battery-operated performance gains
- Low phase noise

Applications

- Telecommunications
- High-shock electronics
- Mobile radio
- Mobile instrumentation
- Airborne communications
- Wireless communications
- Microwave receivers
- Smart munitions

REV: G

Greenray Industries, Inc., 840 West Church Road, Mechanicsburg, PA 17055
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www.greenrayindustries.com

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T70 SERIES
10 MHz to 50 MHz

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Electrical Characteristics						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Nominal Frequency	@ +25°C	10		52	MHz	(FREQ.)
Frequency Stability	-40°C to +85°C		± 0.5	± 1.0	ppm	T15
	-20°C to +70°C		± 0.3	± 0.5	ppm	N57
Aging	1st year		± 1.0	± 3.0	ppm	
	10 years		± 5.0		Ppm	
Acceleration Sensitivity	Worst axis tested @ 90 Hz, 10 g			2.5	ppb/g	SG
				1.0	ppb/g	LG
			0.5	0.7	ppb/g	ULG
Frequency vs Reflow	After 24 hrs recovery			1.0	ppm	
Voltage Control (EFC)	0 to Supply, Positive Slope		± 8		ppm	

Phase Noise Performance						
Parameter	Frequency Offset (Hz)	Min	Typical	Max	Units	
Static @ 20 MHz Nom. Freq.	10		-80		dBc/Hz	
	100		-112		dBc/Hz	
	1 k		-133		dBc/Hz	
	10 k		-145		dBc/Hz	
	100 k		-149		dBc/Hz	
	Floor		-150		dBc/Hz	

DC Supply						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Supply Voltage		4.75	5.0	5.25	Vdc	5.0
Supply Current	CMOS			6	mA	
	Clipped Sine			3	mA	

RF Output						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
CMOS						C
Load			15		pF	
Level		0.8 Vdd "1" Level		0.2 Vdd "0" Level	V	
Symmetry		40	50	60	%	
Clipped Sine						CS
Output Voltage		+ 0.8			V p-p	
Load			10 pF // 10k Ω			

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Environmental and Mechanical Specifications				
Test	Standard	Method	Condition	Description
Vibration	MIL-STD-202G	204	D	20g, 20Hz to 2kHz, Swept Sine
Shock	MIL-STD-202G	213	D	Shock available up to 30,000

Recommendations and General Information	
Parameter	Notes
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +105°C
Terminal Finish	Au (RoHS) (SnPb 63/37 (non-RoHS) Available upon request)
Package Weight	< 0.1 gram
Soldering Instruction	Reflow
Shipping	Tray Pack, Tape & Reel
Marking	NONE

Ordering Example

T70 - N 16 - SG - 10.0 MHz

Model	Temp. Range	Stability	G-Sensitivity	Freq. (MHz)
T70 +3.3V CMOS T71 +5.0V CMOS T72 +3.3V CLIPPED SINE T73 +5.0V CLIPPED SINE	N: -20 to +70°C T: -40 to +85°C	57: ±0.5ppm 16: ±1ppm 26: ±2ppm	SG: < 3.0 ppb/g LG: < 2.5 ppb/g ULG: < 0.7 ppb/g HG: Customer-specific	10 to 50

The Order ID (T70-N16- SG-10.0 MHz) is only used to issue the preliminary quote. The Part Number (T70-1) for the quoted Electrical Characteristics, Screenings, and other options, will be provided with the Greenray Sales Order.

Other specification options are available, please use the contact information below for more information.

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Package Information

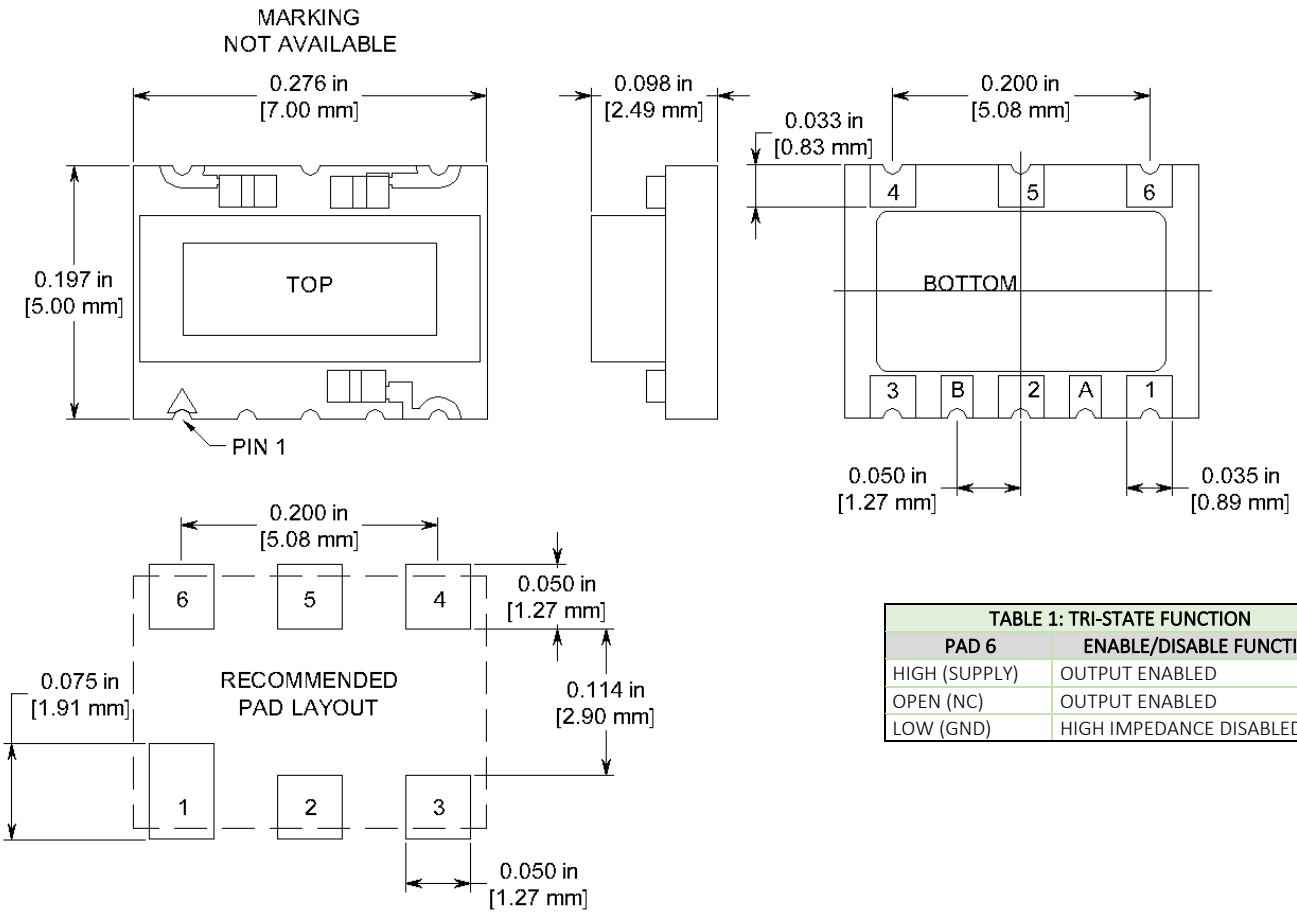

TABLE 1: TRI-STATE FUNCTION	
PAD 6	ENABLE/DISABLE FUNCTION
HIGH (SUPPLY)	OUTPUT ENABLED
OPEN (NC)	OUTPUT ENABLED
LOW (GND)	HIGH IMPEDANCE DISABLED

PAD CONNECTIONS	
1	CONTROL VOLTAGE
2	NO CONNECT (NC)
3	GROUND (GND)
4	OUTPUT
5	TRISTATE OR NC (SEE TABLE 1)
6	SUPPLY VOLTAGE (VDD)
A	NO CONNECT (NC)
B	NO CONNECT (NC)

(NC Pads may have internal connections and should be isolated)

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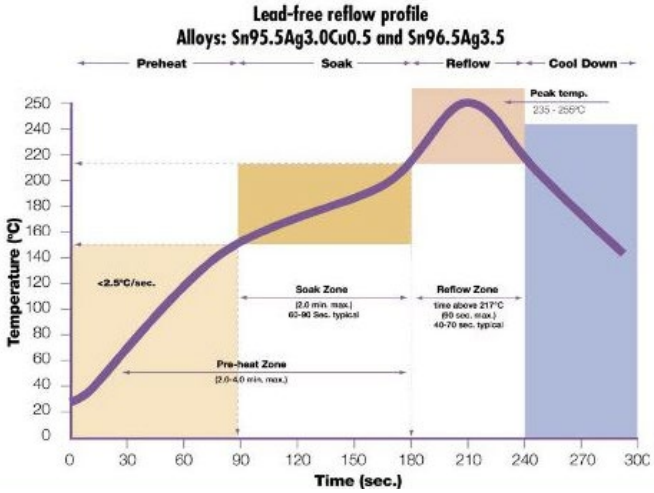
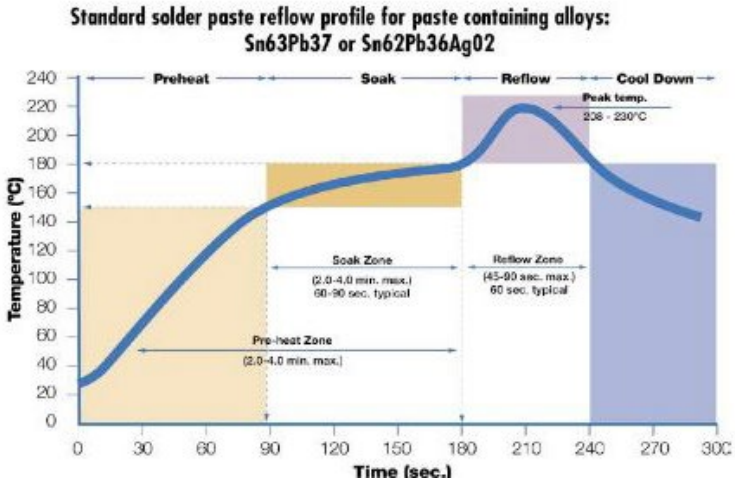
Recommended Solder Reflow Profiles





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