



frequency control solutions

T32

WIDE TEMPERATURE RANGE
LOW ACCELERATION SENSITIVITY
HIGH SHOCK SURVIVABILITY

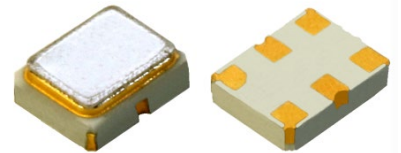
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Product Description

Greenray Industries' T32 Series TCXO has been developed in an ultra-small 3.2 x 2.5 mm package. It can survive extremely high pyrotechnic shocks while providing very low acceleration sensitivity. The T32 operating temperature covers the full MIL range of -55°C to +125°C while holding a frequency stability of only ± 1.0 ppm.

Features

- Wide temperature range -55 °C to +125 °C
- Small and rugged 3.2 x 2.5 mm package
- Tight temperature stability as low as ± 1 ppm over -55 °C to +125°C
- Acceleration sensitivity as low as 0.2 ppb/g
- Shock survivability up to 75,000 g
- Low power consumption
- CMOS or Clipped Sine output
- Fundamental frequency; no PLL artifacts
- Testing per MIL-PRF-55310 product level B available



Applications

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

REV: B1



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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	ppm	T57
	-45°C to +105°C		± 0.5	± 1	ppm	J57
	-55°C to +105°C		± 1.0	± 2	ppm	W16
	-55°C to +125°C		± 1.0	± 2	ppm	X16
Aging	1 st year			± 1	ppm	
Acceleration Sensitivity	Worst axis tested @ 90 Hz, 10 g			2.5	ppb/g	SG
				1	ppb/g	SD
			0.2	0.5	ppb/g	LG
Frequency vs Reflow	After 24 hrs recovery			1.0	ppm	
Frequency vs Voltage	± 5%			0.2	ppm	
Frequency vs Load	± 10%			0.1	ppm	
Voltage Control (EFC)	Available upon request					
Start-up Time			10		mSec	
Phase Noise Performance						
Parameter	Frequency Offset (Hz)	Min	Typical	Max	Units	Ordering Code
Static @ 40 MHz Nom. Freq.	10		-75		dBc/Hz	
	100		-110		dBc/Hz	
	1 k		-132		dBc/Hz	
	10 k		-148		dBc/Hz	
	100 k		-150		dBc/Hz	
	RMS Jitter		570		fSec	
DC Supply						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Supply Voltage		3.0	3.3	3.6	Vdc	B
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
Load			10 pF // 10 kΩ			
Output Power		+ 0.8	+ 1.9	+ 3.0	V p-p	



Environmental and Mechanical Specifications				
Test	Standard	Method	Condition	Description
Vibration	MIL-STD-202G	204	D	20 g, 20 Hz to 2000 Hz, swept sine
Shock	STD	5,000 g, 0.5 ms, half sine		
	HG	Up to 75,000 g, 0.5 ms, half sine (Specify required Level)		

Recommendations and General Information	
Parameter	Notes
Operating Temperature	-55°C to +125°C
Storage Temperature	-60°C to +125°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

Ordering Example										
T32	-	T	-	56	-	CS	-	SG	-	10.0 MHz
Model		Temp. Range		Stability		Output		G-Sensitivity		Freq. (MHz)
		J: -45 to +105°C W: -55 to +105°C X: -55 to +125°C		57: ±0.5ppm 16: ±1ppm 26: ±2ppm 36: ±3ppm 56: ±5ppm		C: CMOS CS: Clipped Sine		SG: < 2.5 ppb/g LG: < 1.0 ppb/g ULG: < 0.5 ppb/g HG: Customer-specific		10 to 52

The Order ID (T32-X56-CS-SG-10.0MHz) is only used to issue the preliminary quote. The Part Number (T32-1) 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.

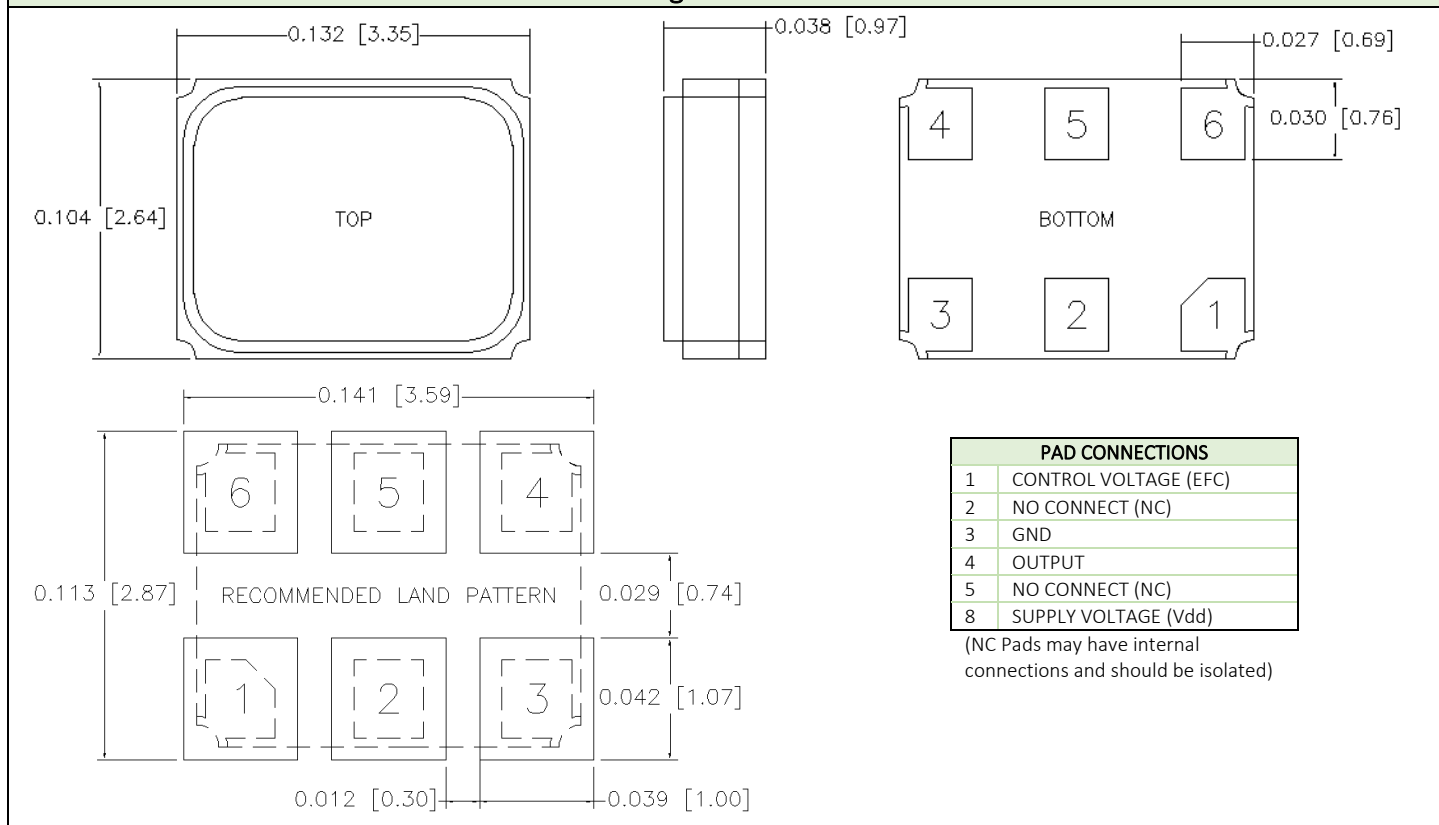


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T32 SERIES
10 MHz to 52 MHz

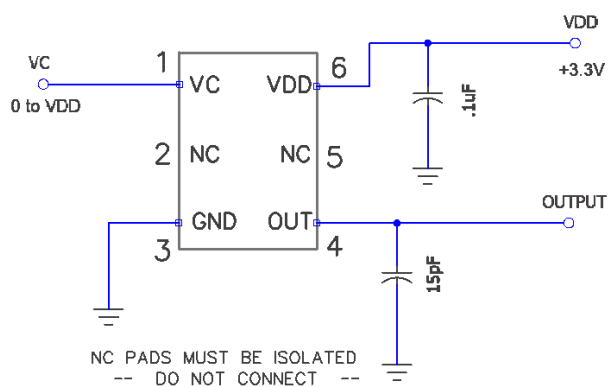
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Package Information

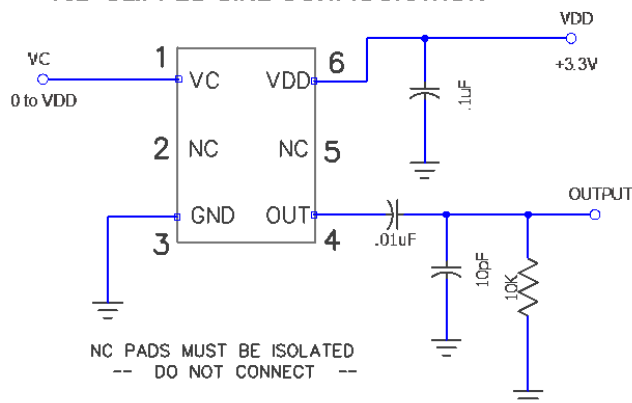


Recommended Configuration

T32 CMOS OUTPUT CONFIGURATION



T32 CLIPPED SINE CONFIGURATION



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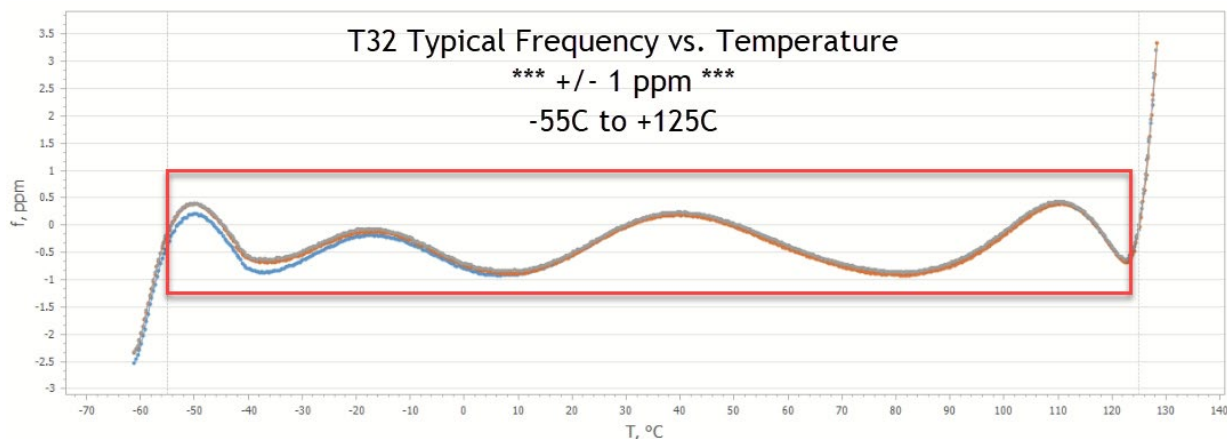
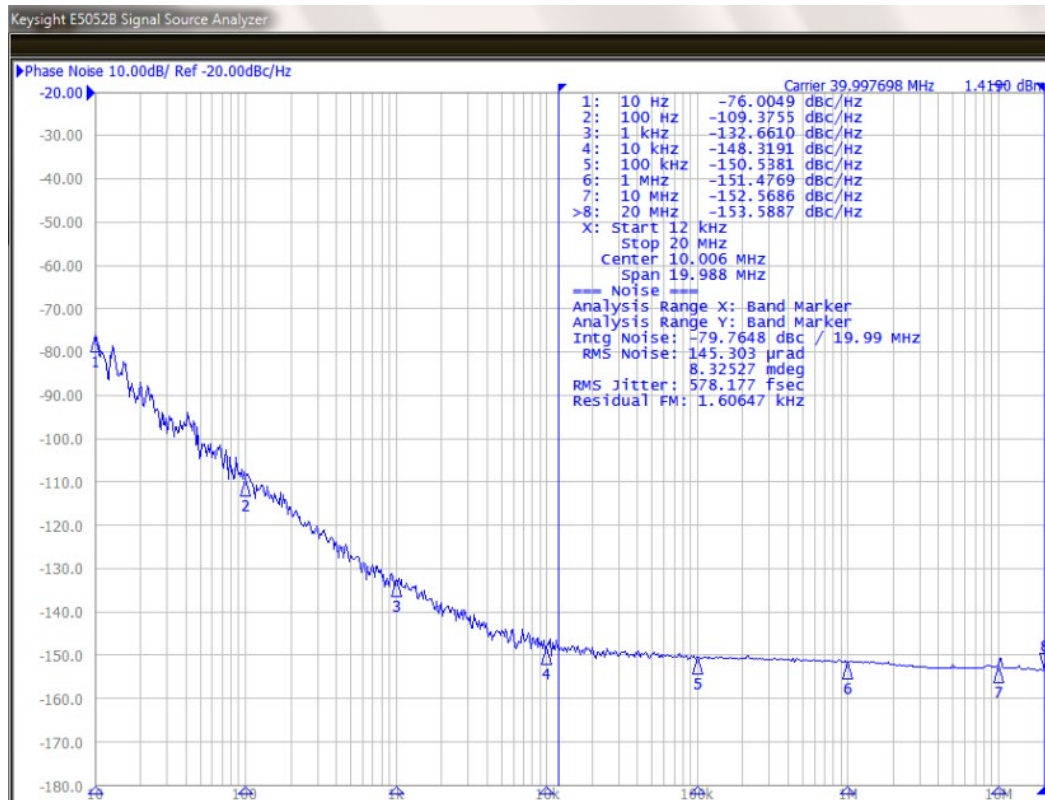


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PHASE NOISE AND JITTER PERFORMANCE



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