GREENRAY
frequency control solutions

T1277

tcxo

HI-REL
RADIATION TOLERANT 200 krad (Si) TID
ULTRA-LOW ACCELERATION SENSITIVITY

Product Description

Greenray Industries' T1277 TCXO offers excellent performance in high shock and vibration environments in a rugged, radiation tolerant design.

Features

- 100 krad (Si) total ionizing dose
- Rugged, hermetic, radiation tolerant 34.8 mm x 20.2 mm 24-PIN DIP package
- Frequency: 20 to 80MHz
- Wide temperature range -55°C to +125°C
- SEL and SET free to 60 MeV cm2/mg
- Ultra-low acceleration sensitivity < 0.07 ppb/g
- +5 VDC supply
- Sinewave output
- MIL-PRF-55310 Level B or S Screening available, COTS version Available

Applications

- High orbit transponders
- Low orbit satellites (nano/micro satellites)
- RF telemetry systems
- Multiband terminal
- Upconverter

REV: -

Greenray Industries, Inc., 840 West Church Road, Mechanicsburg, PA 17055
TEL: 717-766-0223 FAX: 717-790-9509 e-mail: sales@greenrayindustries.com
www.greenrayindustries.com

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T1277 SERIES
20 MHz to 80 MHz

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Electrical Characteristics						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Nominal Frequency	@ +25°C	20		80	MHz	(FREQ.)
Frequency Stability	0°C to +50°C		± 0.3		ppm	B37
	-20°C to +70°C		± 1.0		ppm	N16
	-40°C to +85°C		± 3.0		ppm	T36
	-55°C to +105°C		± 5.0		ppm	W56
	-55°C to +125°C		± 7.0		ppm	X76
Aging	1st year		± 2.0		ppm	
	10 years			± 4.0	ppm	
Acceleration Sensitivity	Worst axis tested @ 90 Hz, 10 g			2.5	ppb/g	SG
				0.7	ppb/g	LG
				0.07	ppb/g	ULG
Frequency vs Voltage	For a 2% change		± 2.0		ppm	
Voltage Control (EFC)	0 to Supply, Negative Slope		± 5.0		ppm	

Phase Noise Performance						
Parameter	Frequency Offset (Hz)	Min	Typical	Max	Units	Ordering Code
Static @ 20 MHz Nom. Freq.	10		-90		dBc/Hz	
	100		-120		dBc/Hz	
	1 k		-140		dBc/Hz	
	10 k		-150		dBc/Hz	
	100 k		-155		dBc/Hz	
	Floor		-160		dBc/Hz	

DC Supply						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Supply Voltage	± 2%	4.9	5.0	5.1	Vdc	E
Supply Current				25	mA	

RF Output						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Sinewave						S
Output Power	50 Ω Load		+ 3.0		dBm	
Harmonics			-30	-26	dBc	

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Environmental and Mechanical Specifications				
Test	Standard	Method	Condition	Description
Vibration	MIL-STD-202	204	B	15 g, 20 to 2,000 Hz, swept sine
Shock	MIL-STD-202	213	C	100 g, 6 ms half-sine
Radiation			TID	100 krad (Si)
			SEL, SET	60 MeV cm2/mg

Screening Levels			
Test	Level S	Level B	Level C
Random Vibration	MIL-STD-202, Method 214, Cond 1-B, 5 min. per axis	N/A	N/A
Thermal Shock	MIL-STD-202, Method 107, Cond. B-1	MIL-STD-202, Method 107, Cond. A	5 Cycles, min. to max. operating temperature
PIND	MIL-STD-202, Method 217	N/A	N/A
Electrical Test (+25°C Parameters)	per Specification	per Specification	per Specification
Burn-in (Load)	240 hrs min. at max. operating temperature	160 hrs min. at max. operating temperature	160 hrs min. at max. operating temperature
Electrical Test (+25°C Parameters)	per Specification	per Specification	per Specification
Seal Test	MIL-STD-202, Method 112, Cond. D	MIL-STD-202, Method 112, Cond. D	MIL-STD-202, Method 112, Cond. D
Radiographic (per Specification)	MIL-STD-209	N/A	N/A
Visual and Mechanical Inspection	MIL-STD-883, Method 2009	MIL-STD-883, Method 2009	J-STD-001, Class 3
Components	JAN, ER-Level S	JAN, ER-Level R	COTS

Recommendations and General Information	
Parameter	Notes
Operating Temperature	-55°C to +125°C
Storage Temperature	-65°C to +125°C
Terminal Finish	Sn 100 (Lead-free), SnPb 63/37 (non-RoHS)
Package Weight	≤ 15 gram
Package Finish	Stainless Steel and Ni plated Kovar
Soldering Instruction	Hand Solder
Shipping	Tray Pack
Marking	GRI Logo, Model #, Frequency, Serial #, Date Code Addition marking upon request if space is available

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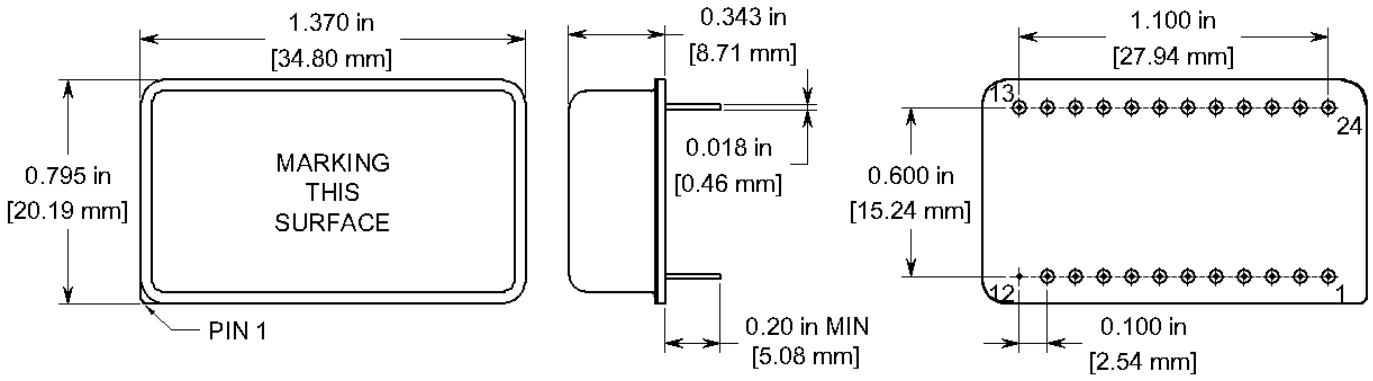
Ordering Example

T1277 -	T	56	- SG	- B	- 20.0 MHz	- PB
Model	Temp. Range	Stability	G-Sensitivity	Screening	Freq. (MHz)	Term. Finish
	B: 0 to +50°C N: -20 to +70°C T: -40 to +85°C W: -55 to +105°C X: -55 to +125°C	57: ±0.5ppm 16: ±1ppm 26: ±2ppm 36: ±3ppm 56: ±5ppm 76: ±7ppm	SG: < 2.5 ppb/g LG: < 0.7 ppb/g ULG: < 0.07 ppb/g HG: Customer-specific	C: Level C B: Level B S: Level S	20 to 80	LF: Sn(Lead-free) PB: SnPb 63/37 (non-RoHS)

The Order ID (T1277-T56-C-SG-B-10.0MHz-PB) is only used to issue the preliminary quote. The Part Number (T1277-1) for the quoted Electrical Characteristics, Screenings, and other options, will be provided with the Greenray Sales Order. Not all combinations of options are available.

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

Package Information



PIN CONNECTIONS	
1	CONTROL VOLTAGE (EFC)
12	GND
13	OUTPUT
24	SUPPLY VOLTAGE (Vdd)

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

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