GREENRAY
frequency control solutions

T1300

tcxo

ULTRA-LOW ACCELERATION SENSITIVITY
LOW PHASE NOISE

Product Description

Greenray Industries' T1300 TCXO offers ultra-low acceleration sensitivity for vibration and shock sensitive applications. When operating under random vibration, the T1300 can offer phase noise improvements of more than 40dB compared to conventional TCXOs - and better performance than most OCXO.

Features

- Proprietary crystal & oscillator design for optimal performance
- Frequency: 10 - 50MHz
- EFC for precise tuning or phase locking apps
- 20.3 x 12.7mm, ruggedized package
- +3.3 or 5VDC Supply
- CMOS output
- g-Sensitivity of <0.07 ppb/g
- Relatively impervious to effects of shock and vibration
- 100% screened for g-Sensitivity performance

Applications

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

Rev. I

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ISO 9001 Quality

AS9100 Aerospace

Electrical Characteristics

Frequency Characteristics						
Parameter	**Conditions**	**Min**	**Typical**	**Max**	**Units**	**Ordering Code**
Nominal Frequency	+25°C	10		50	MHz	
Frequency Stability (other stability available)	-20°C to +70°C		± 1		ppm	N16
	-40°C to +85°C		± 2		ppm	T26
Aging	1st year, after 14 days of operation			± 0.5	ppm	
Acceleration Sensitivity	(Note 1)			0.7	ppb/g	SD
				0.1	ppb/g	LG
				0.07	ppb/g	ULG
Frequency vs Voltage	For a 5% change			± 0.1	ppm	
Frequency vs Load	For a 10% change			± 0.01	ppb	
Electronic Frequency Control	EFC = 0 to V_{DD}, Positive slope 50k Ω input Z		± 6		ppm	
Warm-up time	Within ± 1 ppm			10	msec	
Short-term Stability	1 sec Tau (10 MHz)		8		x 10^{-10}	
Phase Noise Performance						
Parameter	**Frequency Offset (Hz)**	**Min**	**Typical**	**Max**	**Units**	
Phase Noise (static) @ 10 MHz nominal Frequency	10		-100		dBc/Hz	
	100		-130		dBc/Hz	
	1k		-155		dBc/Hz	
	10 k		-162		dBc/Hz	
	100 k		-162		dBc/Hz	
DC Supply						
Parameter	**Conditions**	**Min**	**Typical**	**Max**	**Units**	**Ordering Code**
Supply Voltage V_{DD}		3.0	3.3	3.6	VDC	3.3
		4.75	5.0	5.25	VDC	5.0
Supply Current				20	mA	
RF Output: CMOS Square Wave						
Parameter	**Conditions**	**Min**	**Typical**	**Max**	**Units**	
Load	CMOS		15		pF	
Level	15 pF load, 3.3V	+2.8 "1" level		+0.2 "0" level	V	
	15 pF load, 5.0V	+4.5 "1" level		+0.2 "0" level	V	
Symmetry	CMOS	40	50	60	%	

(1) Acceleration Sensitivity is worst axis tested at 90 Hz, 10 g

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Environmental and Mechanical Specifications

Screenings			
Screening	**Standard**	**Method, Condition**	**Description**
Vibration	MIL-STD-883	2007, Cond A	50 g, 20 to 2,000 Hz, swept sine
Shock	MIL-STD-883	2002, Cond B	1,500 g, 0.5 ms half-sine

Recommendation and General Information

Conditions	
Parameter	**Notes**
Operating Temperature	-40°C to +85°C
Storage Temperature	-45°C to +90°C
Terminal Finish	Gold is standard. SnPb 63/37 (non-RoHS) is available
Package	Stainless Steel and Nickel-plated Kovar
Package Weight	3 grams
Soldering Instruction	Hand soldering
Shipping	Tray pack
Marking	Line 1: Greenray logo Line 2: Model Line 3: Frequency Line 4: Serial Number + Date Code (YYWW)

Ordering Example

T1300	-	**T26**	-	**5.0**	-	**LG**	-	**10.0MHz**	-	**E**
Model		Stability Code		Supply Voltage		G-Sensitivity Code		Frequency in MHz		Termination finish
		Refer to Electrical Specs Table* N16 (-20 to +70°C) T26 (-40 to +85°C)		3.3: 3.3V 5.0: 5.0V		SD: < 0.7 ppb/g LG: < 0.1 ppb/g ULG: < 0.07 ppb/g HG: Customer-specific		From 10 to 50 MHz		E: Gold plated (RoHS), Standard PB: SnPb 63/37 (non-RoHS) LF: SnAg 96.5/3.5 (Lead-free)

*other frequency stabilities available, please contact factory

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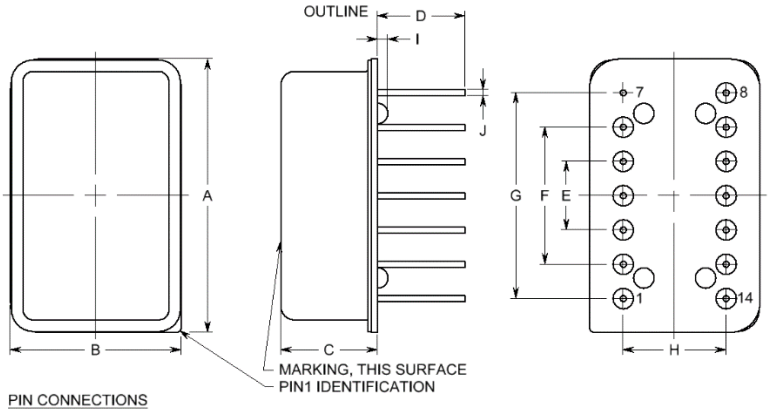
Package dimensions and Pad Connections



PART DIMENSIONS

	TYP.		MAX.	
DIM	inches	mm	inches	mm
A	0.800	20.32	0.815	20.70
B	0.500	12.70	0.515	13.08
C	NA	NA	0.370	9.34
D	0.215	5.46	0.230	5.84
E	0.200	5.08	0.210	5.33
F	0.300	7.62	0.310	7.87
G	0.600	15.24	0.610	15.49
H	0.300	7.62	0.310	7.87
I	0.018	0.46	0.024	0.61
J	ø0.018	ø0.46	ø0.021	ø0.53

PIN CONNECTIONS
1. EFC
7. 0V & CASE GND
8. OUTPUT
12. EFC FILTER ENABLE (SEE NOTE 1)
14. SUPPLY

NOTES:
1. EFC INPUT IS THROUGH A LOW PASS FILTER FOR PHASE NOISE REDUCTION. THE FILTER MAY BE DISABLED FOR FASTER RESPONSE BY GROUNDING PIN 12. THE FILTER IS ENABLED IF THE PIN IS FLOATING OR AT LOGIC "1" (+5V).
2. REMAINING PINS ARE NOT CONNECTED