



frequency control solutions

tcxo

## T124

LOW FREQUENCY TCXO  
TIGHT TEMPERATURE STABILITY

### Product Description

Greenray Industries' T124 TCXO features Ultra-low frequency & rugged SMT package.

### Features

- Available from 650Hz to 5MHz
- 17.3 mm sq. package
- 3.3 VDC Supply
- CMOS Square wave output
- Temperature Stability to  $\pm 0.5$ ppm over -40 to +85°C
- Low Power consumption
- Extended, long-term stability performance
- Ideal for mobile, RF applications



### Applications

- Telecommunications
- Mobile radio
- Mobile instrumentation
- Airborne communications
- Wireless communications
- Microwave receivers

Rev. E



ISO 9001  
Quality

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**T124 SERIES**  
650 Hz to 5.0 MHz



## Electrical Characteristics

Frequency Characteristics						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Nominal Frequency	CMOS Square Wave	650		5.0 M	Hz	
	-20°C to +70°C		± 0.3		ppm	N37
	-40°C to +85°C		± 0.5		ppm	T57
	-40°C to +85°C		± 1		ppm	T16
Total Stability	From nominal over 10 years (including temp stability, load, aging, supply V)			± 5	ppm	
Aging	1 <sup>st</sup> year			± 0.5	ppm	
Acceleration Sensitivity	(note 1)			2.5	ppb/g	
Frequency vs Voltage	For a 5% change			± 0.3	ppm	
Frequency vs Load	For a 5% change			± 0.3	ppm	
Electronic Frequency Control	EFC = 0 to V <sub>DD</sub> Positive slope		± 7		ppm	
Phase Noise Performance						
Parameter	Frequency Offset (Hz)	Min	Typical	Max	Units	
Phase Noise (static) @ 1 MHz nominal Frequency	10		-75		dBc/Hz	
	100		-102		dBc/Hz	
	1k		-125		dBc/Hz	
	10 k		-140		dBc/Hz	
	100 k		-145		dBc/Hz	
DC Supply						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Supply Voltage (V <sub>DD</sub> )		4.75	5.0	5.25	VDC	5.0
		3.0	3.3	3.6	VDC	3.3
Supply Current				20	mA	
RF Output: CMOS Squarewave						
Parameter	Conditions	Min	Typical	Max	Units	
Symmetry	CMOS	45	50	55	%	
Load			15		pF	
Level	15 pF	V <sub>DD</sub> -0.2 "1" level		+0.2 "0" level	V	

(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-202G	214, II. F	0.3 PSD, 24.06 g RMS, 3min/axis
Shock	MIL-STD-202G	213	90 g peak, half sine, 5 ms

## Recommendation and General Information

Conditions	
Parameter	Notes
Operating Temperature	-40°C to +85°C
Storage Temperature	-54°C to +105°C
Terminal Finish	Gold plating is the standard. SnPb 63/37 (non-RoHS) and SnAg (RoHS) are available
Package Weight	3 grams
Soldering Instruction	Hand and solder reflow
Shipping	Type of package (tray pack)
Marking	Line 1: Greenray logo Line 2: Model Line 3: Frequency Line 4: Serial Number Line 5: Data code (YYWW)

## Ordering (Example)

<b>T124</b>	-	<b>T16</b>	-	<b>3.3</b>	-	<b>32.768kHz</b>	-	<b>E</b>
Model		Stability		Supply Voltage		Frequency in Hz, kHz, or MHz		Termination finish
		<u>Refer to Electrical Specs Table*</u> N37 (-20 to +70°C) T57 (-40 to +85°C) T16 (-40 to +85°C)		3.3: 3.3 VDC 5.0: 5.0 VDC		From 650 Hz to 5 MHz		<u>Code: Pads finish</u> E: Gold plated (RoHS), standard PB: SnPb 63/37 (non-RoHS) LF: SnAg 96.5/3.5 (RoHS)

\*other frequency stabilities available, please contact factory



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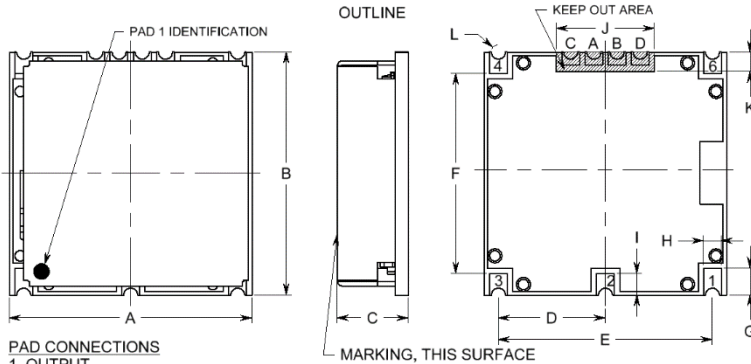


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## Package dimensions and Pad Connections

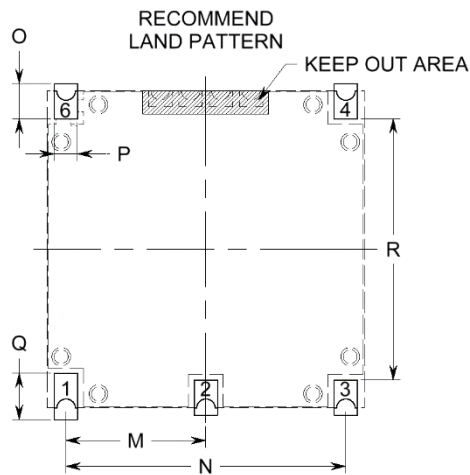


### PAD CONNECTIONS

- 1. OUTPUT
- 2. NC
- 3. SUPPLY
- 4. EFC
- 6. 0V & CASE GND
- A. DIO (INTERNAL USE ONLY)
- B. CS (INTERNAL USE ONLY)
- C. SCLK (INTERNAL USE ONLY)
- D. NC (INTERNAL USE ONLY)

### PART DIMENSIONS

DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.680	17.27	0.690	17.53
B	0.680	17.27	0.690	17.53
C	NA	NA	0.200	5.08
D	0.300	7.62	0.310	7.87
E	0.600	15.24	0.610	15.49
F	0.560	14.22	0.570	14.48
G	0.075	1.91	0.085	2.16
H	0.050	1.27	0.060	1.52
I	0.060	1.52	0.070	1.78
J	0.275	6.99	0.285	7.24
K	0.060	1.52	0.070	1.78
L	R0.020	R0.51	NA	NA



### LAND PATTERN DIMENSIONS

DIM	TYP.		MAX.	
	inches	mm	inches	mm
M	0.300	7.62	NA	NA
N	0.600	15.24	NA	NA
O	0.075	1.91	NA	NA
P	0.050	1.27	NA	NA
Q	0.100	2.54	NA	NA
R	0.560	14.22	NA	NA



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