



frequency control solutions

tcxo

## T52

TIGHT TEMPERATURE STABILITY  
LOW G-SENSITIVITY OPTION  
30,000g SHOCK OPTION

### Product Description

Greenray Industries' T52 Series TCXO has been developed as a reference oscillator for timing applications requiring low noise, low power draw, tight stability over temperature, and a compact footprint.



### Features

- Small and rugged 5.0 x 3.2 mm package
- Withstand vibration, and high shock up to 30,000 g
- Tight temperature stability of  $\pm 0.1$  ppm over  $-20$  to  $+70^{\circ}\text{C}$
- Excellent long-term aging  $< 5$  ppm over 10 years
- Low acceleration sensitivity  $< 0.7$  ppb/g
- Low power consumption, as low as 2mA, enable reliable, battery-operated performance gain.
- Low phase noise

### Applications

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

Rev. E



ISO 9001  
Quality

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AS9100  
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frequency control solutions

**T52 SERIES**  
10 MHz to 52 MHz



## Electrical Characteristics

Frequency Characteristics						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Nominal Frequency	+25°C	10		52	MHz	
Frequency Stability (other stabilities available)	-20°C to +70°C		± 0.1		ppm	N17
	-40°C to +85°C		± 0.5		ppm	T57
	-40°C to +85°C		± 1		ppm	T16
Aging	1 <sup>st</sup> year		± 1	± 3	ppm	
Acceleration Sensitivity	(Note 1)			2	ppb/g	SD
				0.7	ppb/g	LG
Frequency vs Reflow	After 24hrs recovery			1	ppm	
Electronic Frequency Control	EFC = 0 to V <sub>DD</sub> Positive slope		± 8		ppm	
DC Supply						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
Supply Voltage (V <sub>DD</sub> )		2.85	3.0	3.15	VDC	3.0
		3.0	3.3	3.6	VDC	3.3
		4.75	5.0	5.25	VDC	5.0
Input Current	CMOS			6	mA	
	Clipped Sinewave			3	mA	
RF Outputs available: CMOS and Clipped Sine						
Parameter	Conditions	Min	Typical	Max	Units	Ordering Code
<b>CMOS Output</b>						C
Load			15		pF	
Level	V <sub>DD</sub> = 3.3V	+2.8 "1" Level		+0.2 "0" level"	V	
	V <sub>DD</sub> = 5.0V	+4.2 "1" Level		+0.2 "0" level"	V	
Symmetry		40	50	60	%	
<b>Clipped Sine Output</b>						S
Load			10 pF // 10k Ω			
Level		+0.8			V p-p	

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



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## Environmental Screenings

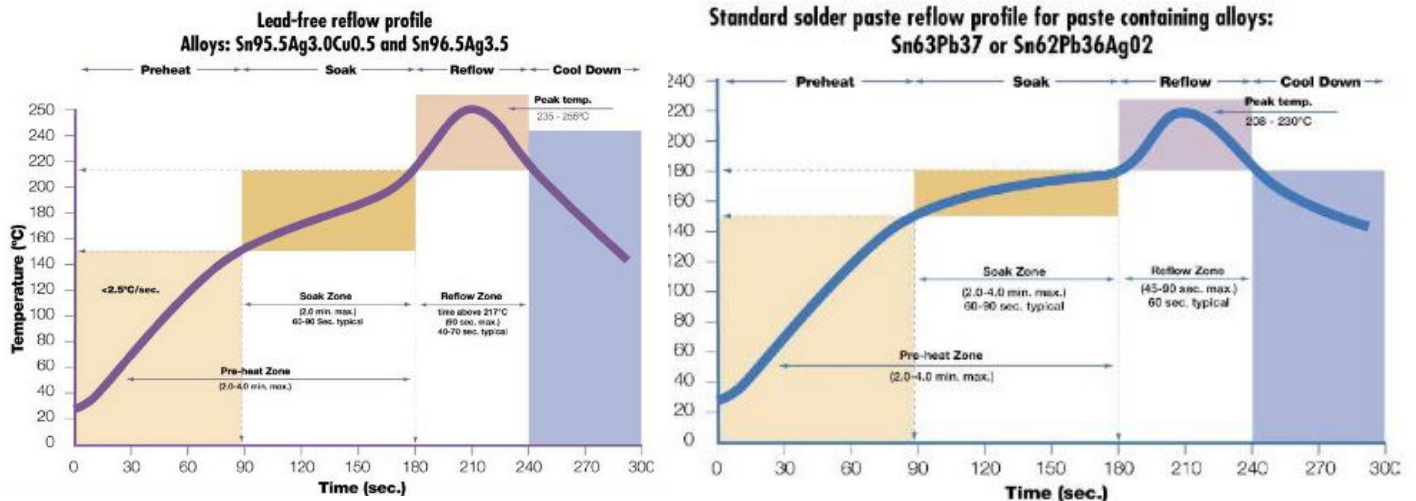
Environmental				
Screening	Conditions	Method	Notes	Ordering Code
Vibration	MIL-STD-202G	214	Cond I-F	
Shock	MIL-STD-202G	213	Cond D. Shock available up to 30,000 g	HG

## Ordering Example

T52	N17	C	3.3	LG	20.0MHz	E
Model	Stability Code	Output Code	Supply Voltage	G-Sensitivity Code	Frequency in MHz	Termination finish
	Refer to Electrical Specs Table* N17 (-20°C to +70°C) T57 (-40°C to +85°C) T16 (-40°C to +85°C)	C: CMOS S: Clipped Sinewave	3.0: 3.0V 3.3: 3.3V 5.0: 5.0V	SD: < 2 ppb/g LG: < 0.7 ppb/g HG: Customer-specific	From 10 to 52 MHz	E: Gold plated (RoHS), Standard

\*other frequency stabilities available, for further information please contact factory.

## Recommended Solder Reflow Profiles



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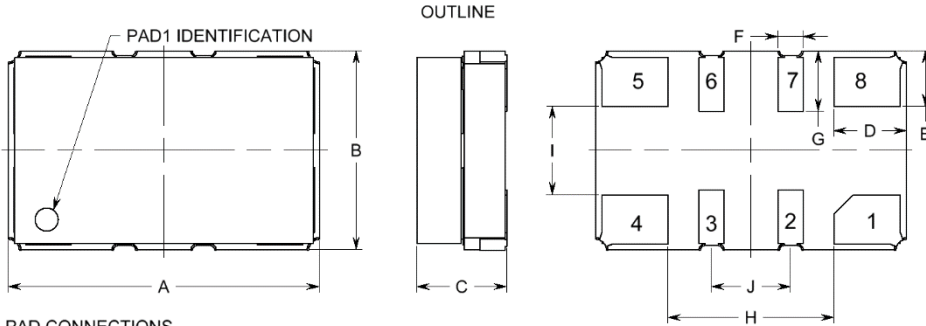


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10 MHz to 52 MHz



## Package information



**PART DIMENSIONS**

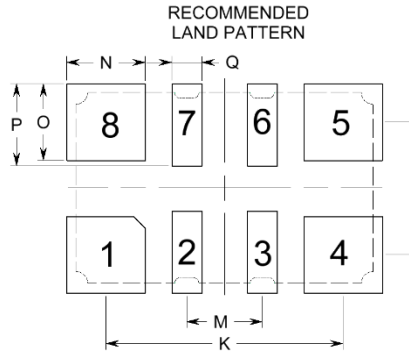
DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.197	5.00	0.207	5.25
B	0.126	3.20	0.136	3.45
C	NA	NA	0.079	2.00
D	0.046	1.17	NA	NA
E	0.035	0.89	NA	NA
F	0.016	0.41	NA	NA
G	0.038	0.97	NA	NA
H	0.105	2.67	0.115	2.92
I	0.056	1.42	0.066	1.68
J	0.050	1.27	0.060	1.52

**PAD CONNECTIONS**

1. EFC
2. CS (INTERNAL USE ONLY)
3. ADIO (INTERNAL USE ONLY)
4. GND
5. OUTPUT
6. TRI-STATE/NC (SEE TABLE 1)
7. VC (INTERNAL USE ONLY)
8. SUPPLY

**TABLE 1: TRI-STATE FUNCTION**

PAD 6	ENABLE/DISABLE FUNCTION
HIGH (SUPPLY)	OUTPUT ENABLED
OPEN (NC)	OUTPUT ENABLED
LOW (GND)	HIGH IMPEDANCE DISABLED

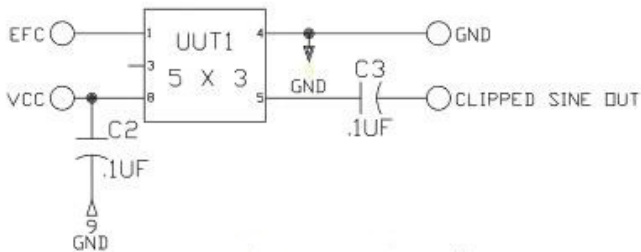


**LAND PATTERN DIMENSIONS**

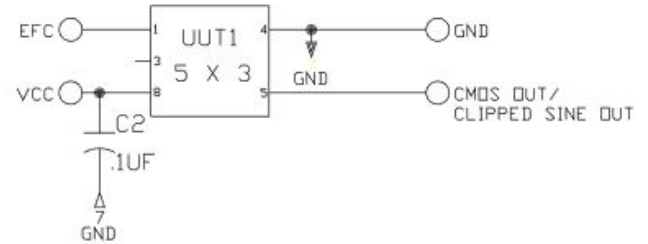
DIM	TYP.		MAX.	
	inches	mm	inches	mm
K	0.147	3.73	0.157	3.99
L	0.126	3.20	0.136	3.45
M	0.047	1.19	NA	NA
N	0.049	1.25	NA	NA
O	0.047	1.19	NA	NA
P	0.051	1.30	NA	NA
Q	0.019	0.48	NA	NA

## Recommended Configuration

CLIPPED SINE (AC COUPLED)



CMOS/  
CLIPPED SINE (DC COUPLED)



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