AN-XA7XXXX-X Series
HF SMD TCXO/VCTCXO
Ultra Low Phase Noise

Rev V

Description: The AN-XA7XXXX Series of SMD temperature compensated crystal oscillators (TCXO), provides High Frequency with excellent temperature stability, extremely low phase noise and jitter with Sine-wave output in a small surface mount FR4 based package.

Features

- **Small, Low Profile SMD Package**
- **Very Low Phase Jitter and Phase Noise**
- **Excellent Frequency Stability**
- **Frequency – up to 250 MHz**
- **No Multiplication – no sub-harmonics**
- **Stratum3 available**
- **COTS/Dual use**

Creating a Part Number

AN - X A7 X X X X - X - FREQ

Package Code
AN 8 Pad 17x14x6mm SMD

Supply Voltage

Code	Specification
0	5V ±5%
A	3.3V ±5%

Voltage Control

Code	Specification
V	Voltage Control
N	No Voltage Control

Phase Noise Grade

Code	Specification
L	Standard per table
P	Premium per table
U	Ultimate per table

Temp. Frequency Stability

Code	Specification
1	±1.0 ppm
2	±2.5 ppm
3	±0.28 ppm
9	Customer Specific

Temperature Range

Code	Specification
E	-10°C to 60°C
B	0°C to 70°C
C	-20°C to 70°C
D	-40°C to 85°C

Environmental

Code	Specification
L	Contains a level of lead that is in excess of RoHS directive.
R	RoHS compliant

Not all combinations available – consult factory

NEL FREQUENCY CONTROLS, INC.
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Specifications (1)

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Electrical							
Frequency Range	F	Sine-wave	10		250	MHz	
Input Voltage	Vcc		3.135 4.75	3.30 5.0	3.465 5.25	V	A 0
Input Current	Icc	Sine			40	mA	@100MHz, 3.3V
Frequency Stab.	ΔF/F	Overall, available			±4.6		20 years
Frequency Stability	ΔF/F	vs. Temperature vs. Vcc aging		±0.5 ±0.1 ±1 ±2.5 ±3.5	±1	ppm ppm/V ppm/year ppm ppm	See chart First Year 7 years 10 years
Calibration	ΔF/F	As shipped, 25ºC		±0.5	±1	ppm	
Load		Sine		Internally AC-coupled 50 Ohm			
Output power (2)	P	Sine-wave Into 50 Ohms	0 4	3 7		dBm	3.3V 5.0V
Start up time	Ts			2	100	ms	
Phase Jitter		1σ		0.4 0.2	1 0.4	ps	100Hz to 20MHz 12KHz to 20MHz
Subharmonics				none			
Spurious					-110	dBc	
Harmonics		Sine-wave		-30	-25	dBc	
SSB Phase Noise		@10Hz @100 Hz @1 KHz @10 KHz @100 KHz		-80 -110 -140 -155 -160		dBc/Hz	@100MHz, Grade L
SSB Phase Noise		@10Hz @100 Hz @1 KHz @10 KHz @100 KHz		-90 -120 -146 -160 -165			@100MHz, Grade P
SSB Phase Noise		@10Hz @100 Hz @1 KHz @10 KHz @100 KHz		-95 -128 -152 -170 -172	-93 -125 -150 -168 -170		@100MHz, Grade U (3)
SSB Phase Noise		@10Hz @100 Hz @1 KHz @10 KHz @100 KHz		-105 -135 -150 -160 -165		dBc/Hz	@20 MHz
Input Impedance				>10K Ohm			
Control voltage	Vc		0		3.0	V	
Modulation bandwidth	MB				1.5	Hz	
Deviation	ΔF/F	Vc=0V to 3.3V,25°C	±5	±7		ppm	

Note: 1) All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load
2) Higher output power available – consult factory (current consumption may increase)
3) -40 to 85°C range for "U" grade is available with 5 V Vcc option only.

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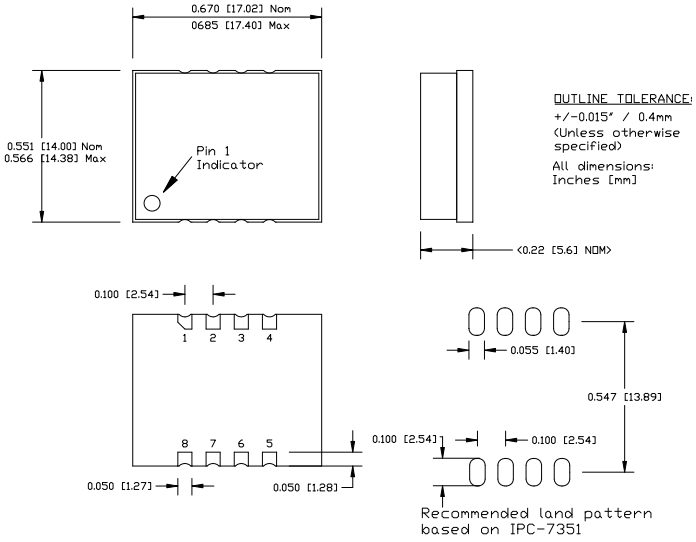
Absolute Maximum Ratings

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Input Break Down Voltage	Vcc		-0.5		5.5	V	
Storage temp.	Ts		-40		105	° C	
Contr. Voltage	Vc		-1		9	V	

Environmental and Mechanical

Operating temp. range	0°C to 70°C , -40°C to 85°C, see chart, page 1
Mechanical Shock	Per MIL-STD-202, Method 213, Cond. E
Thermal Shock	Per MIL-STD-883, Method 1011, Cond. A
Vibration	Per MIL-STD-883, Method 2007, Cond. A
Soldering Conditions	See MAX reflow profile; The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.
Hermetic Seal	Leak rate less than $1x10^{-8}$ atm.cc/s of helium (crystal only)



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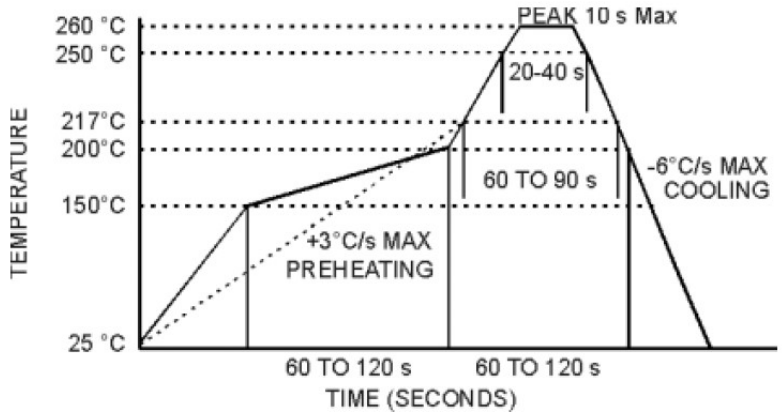
Electrical Connections

Pin out	Pin 1=Vcc; Pin 2=Do Not Connect; Pin 3=GND; Pin 4=GND; Pin 5=Output; Pin 6= Optional Voltage Control; Pin 7 & 8= Do Not Connect

Maximum solder reflow profile



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