

HF SMD TCXO/VCTCXO Ultra Low Phase Noise



ESD Sensitive

17.4 x 14.38 x 5.6 mm

Datasheet 0749C

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

Applications

- COTS/Dual use

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	V _{cc}		-0.5		5.5	V	
Storage temp.	T _s		-40		105	°C	
Contr. Voltage	V _c		-1		9	V	

Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency Range	F	Sine-wave	10		250	MHz	
Input Voltage	V _{cc}		3.135 4.75	3.30 5.0	3.465 5.25	V	A 0
Input Current	I _{cc}	Sine			40	mA	@100MHz, 3.3V
Frequency Stab.	ΔF/F	Overall, available			±4.6		20 years
Frequency Stability	ΔF/F	vs. Temperature vs. V _{cc} 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, 25°C		±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	T _s			2	100	ms	
Phase Jitter		1σ		0.4 0.2	1 0.4	ps	100Hz to 20MHz 12KHz to 20MHz
Subharmonics			none				
Spurious					-80	dBc	@ 100 MHz
Harmonics		Sine-wave		-30	-25	dBc	

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Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
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	V _c		0		3.0	V	
Modulation bandwidth	MB				1.5	Hz	
Deviation	ΔF/F	V _c =0V to 3.3V,25°C	±5	±7		ppm	

Environmental and Mechanical

Parameter	Description
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)



Creating a Part Number

AN - X A7 X X X X - X - XX.XXX MHz - X

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

Packaging	
Code	Specification
Blank	Bulk

Output Frequency
Please specify the frequency in units of MHz out to 3-digit accuracy after the decimal.
Example: 20.000MHZ

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

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

Not all combinations are available. Consult Factory

Temperature Code Table

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

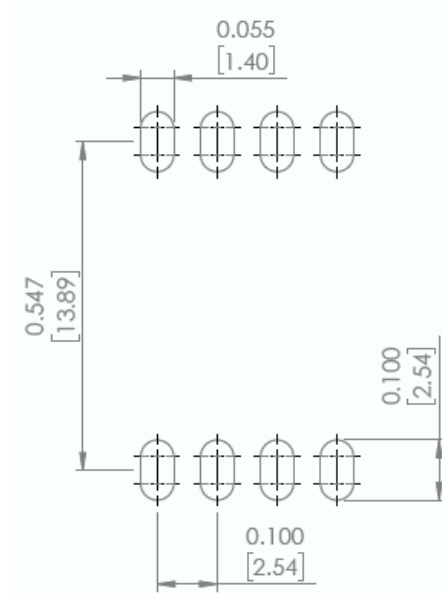
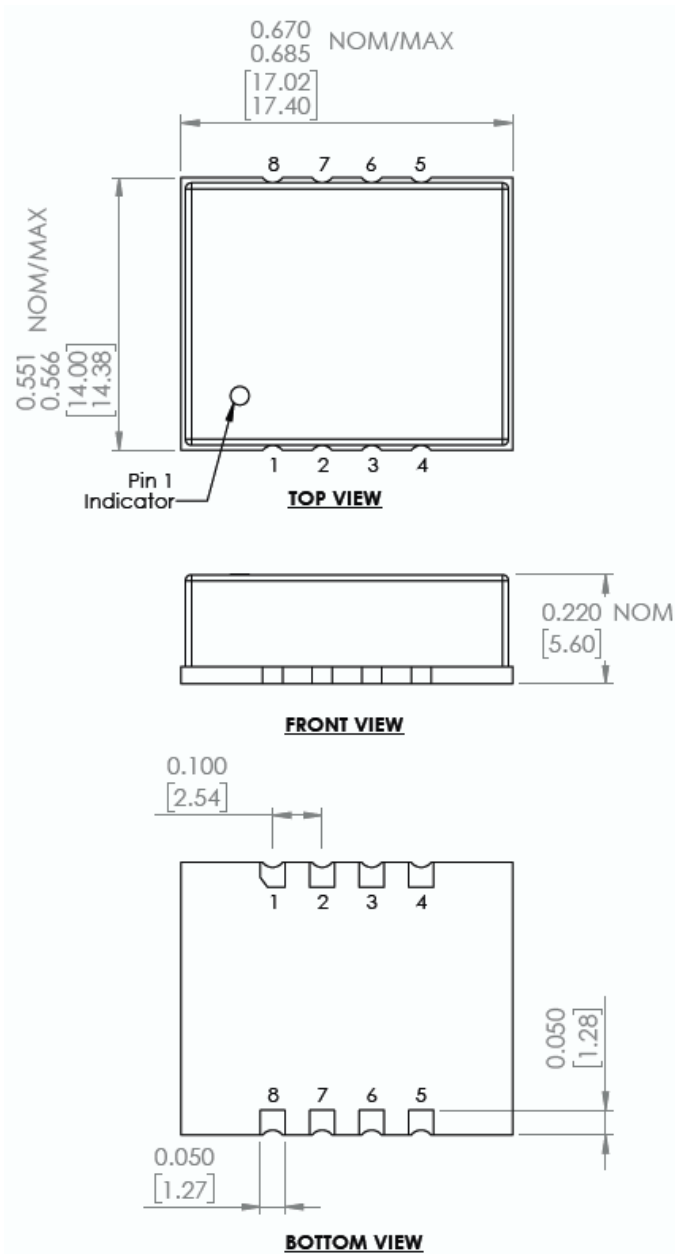
Notes:

- 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.



Mechanical Dimensions

Recommended Land Pattern



Pin #	Function
1	Vcc
2	Do Not Connect
3	GND
4	GND
5	Output
6	Optional Voltage Control
7	Do Not Connect
8	Do Not Connect

Dimensions: inches [mm]



Reflow Profile [JEDEC J-STD-020]

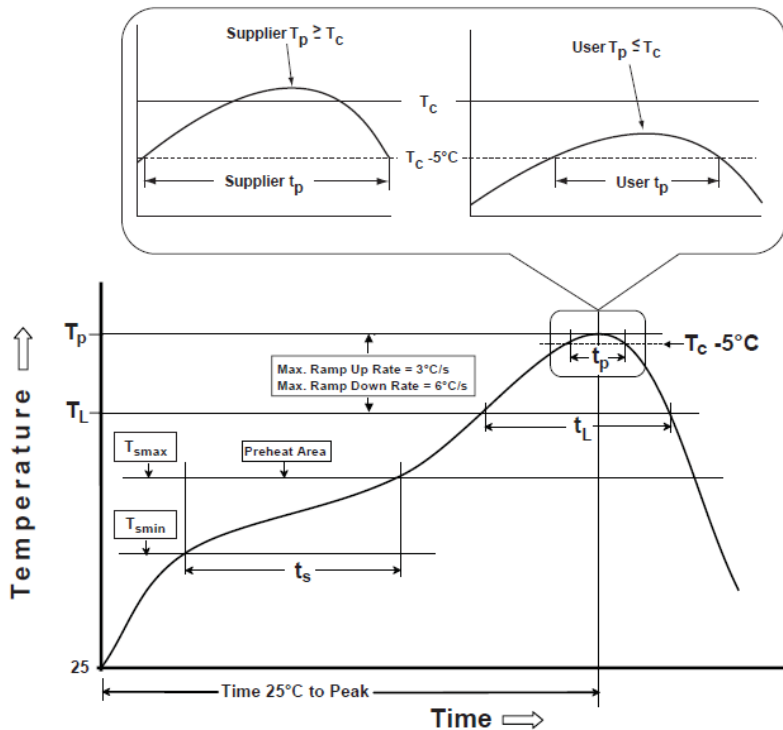


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5 mm	235°C	220°C
≥ 2.5 mm	220°C	220°C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6 mm	260°C	260°C	260°C
1.6 mm - 2.5 mm	260°C	250°C	245°C
>2.5 mm	250°C	245°C	245°C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_p)*	see Table 1	see Table 2
Time (t_p)** within 5°C of the specified classification temperature (T_c)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	1 max	1 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.