

SMD VCXO Ultra-Low Phase Noise With Low G Sensitivity



ESD Sensitive

14.35 x 9.27 x 6.48 mm

Datasheet #2202A

Features

- Small, Low Profile SMD Package
- Ultra-Low Phase Noise
- Low G Sensitivity
- No Multiplication-no sub-harmonics

Applications

- COTS/Dual use

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	Vcc		-0.5		5.5	V	
Storage temper.	Ts		-55		85	°C	
Control Voltage	Vc		-1		5.5	V	

Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency Range	F		80		125	MHz	
Input Voltage	Vcc		3.135 4.75	3.30 5.00	3.465 5.25	V	A 0
Input Current	Icc	Sine			30	mA	
Frequency Stability	$\Delta F/F$	vs. Temperature vs. Vcc aging		± 10 ± 0.1 ± 1 ± 3 ± 4		ppm ppm/V ppm/year ppm ppm	See chart First Year 7 Years 10 Years
G-sensitivity		Worst Direction		0.2		ppb/G	
Setability	Vset		Vcc/2 - 0.1 Vcc	Vcc/2	Vcc/2 + 0.1 Vcc	V	
Load		Sine CMOS	Internally AC-coupled 50 Ohm 10 KOhm // 15 pF				
Output power (output code "S")	P	Sine-wave Into 50 Ohms	7	10		dBm	
Logic 1 (CMOS)	Voh		0.9Vcc			V	Output Code T
Logic 0 (CMOS)	Vol				0.1	V	Output Code T
Duty Cycle			45/55		55/45	%	Output Code T
Rise/Fall Time	Tr/Tf			2	3		Output Code T
Spurious		Not setup related			-80	dBc	
Harmonics		Sine-wave		-30	-25	dBc	



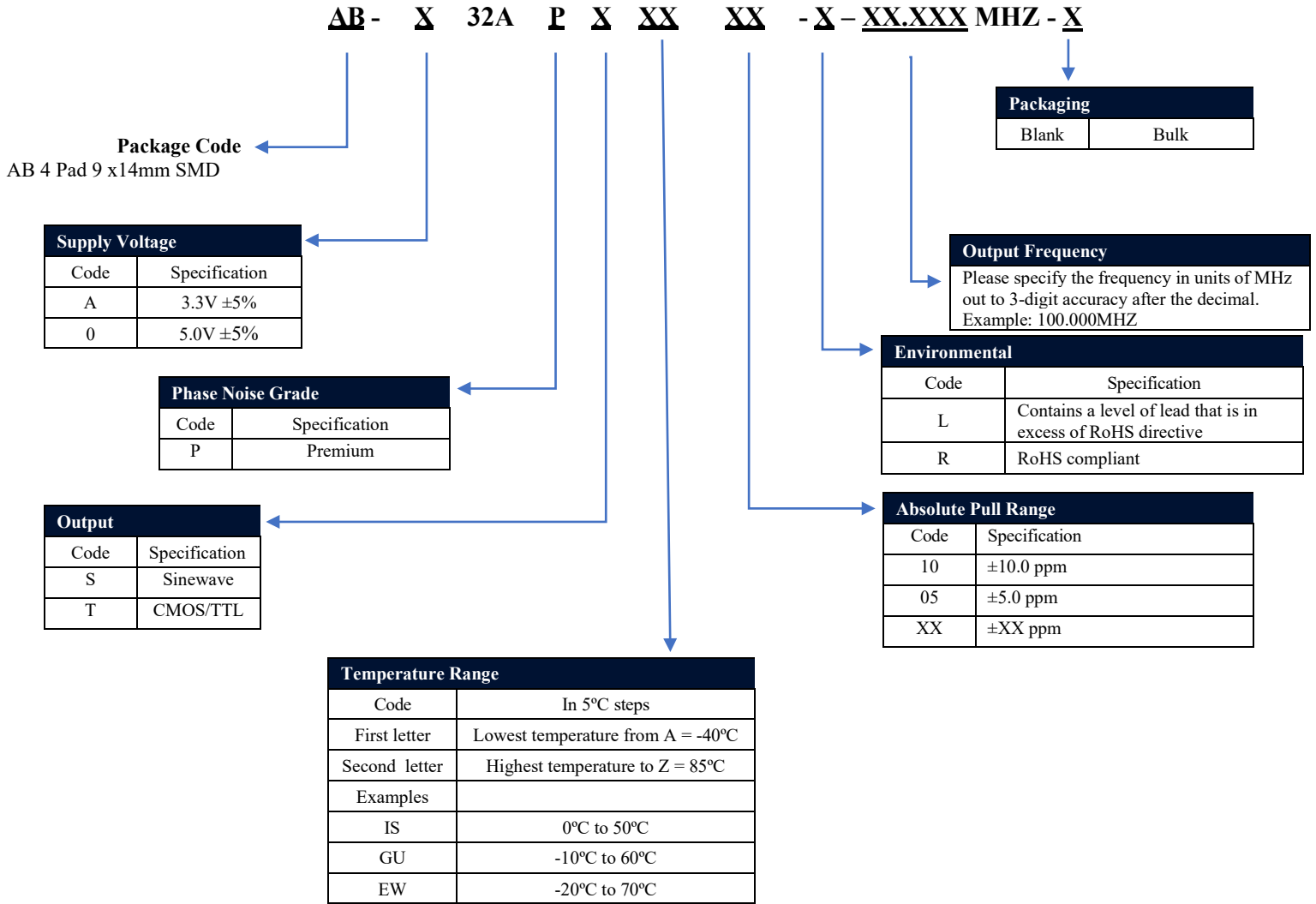
Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
SSB Phase Noise	£(Δf)	@10 Hz @100 Hz @1 KHz @10 KHz @100 KHz		-90 -120 -146 -160 -168		dBc/Hz	@100MHz, Grade P, APR ±25
		@10 Hz @100 Hz @1 KHz @10 KHz @100 KHz		-80 -110 -135 -155 -168			@125MHz, Grade P, APR ±20
Input Impedance			>10K Ohm				
Control voltage	V _c		0.15 0		3.15 5.0	V	Code A Code 0
Modulation bandwidth	MB		DC		10	KHz	2*
Initial Pullability	ΔF/F	As shipped		±50		ppb	Depends on APR
Absolute pull Range (Guaranteed Capture Range)	ΔF/F	Over All Conditions, Specify in the part number			±25	ppm	Includes temperature, V _{cc} variations, and aging 10 years

Environmental and Mechanical

Parameter	Description
Operating temp. range	-40°C to 85°C MAX
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



Not all combinations are available. Consult Factory.

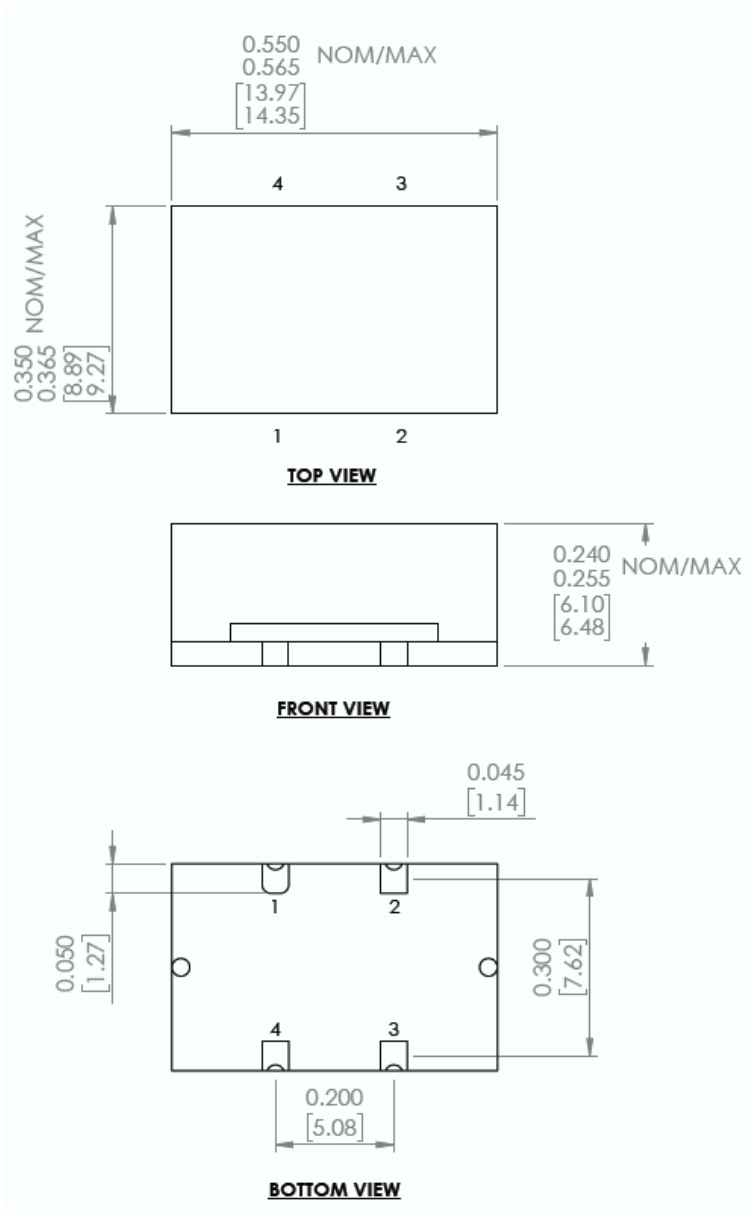
Temperature Code Table

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		

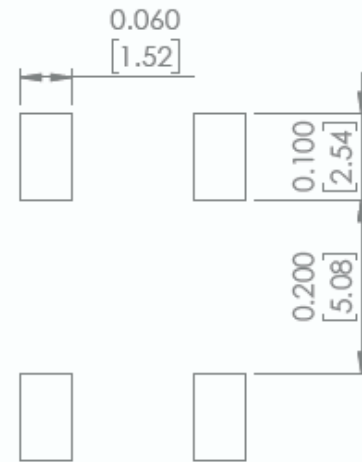
Notes:

- 1) All parameters, unless otherwise specified, are at nominal conditions, i.e.: T=25°C, Nominal Vcc & Nominal Load
- 2* The MBW can be extended to 20 KHz by special requirements on the best effort basis.

Mechanical Dimensions



Recommended Land Pattern



OUTLINE TOLERANCE:
±0.015 [0.40] (UNLESS OTHERWISE SPECIFIED)

Pin #	Function
1	Vc
2	GND
3	Output
4	Vcc

Dimensions: inches [mm]

Reflow Profile [JEDEC J-STD-020]

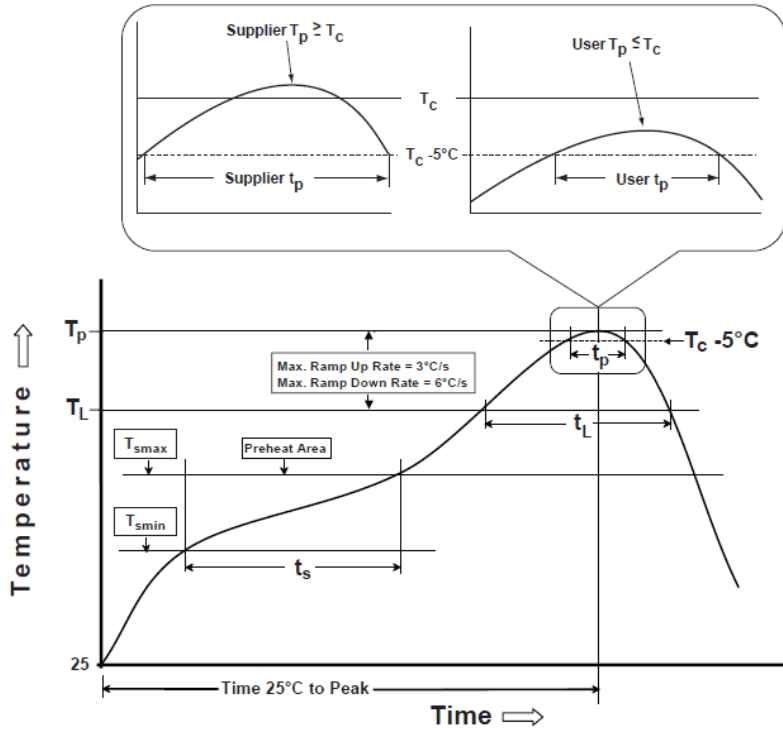


Table 1

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.

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Phase Noise Plot

125 MHz example

