

## PECL/LVPECL UHF VCXO



17.4 x 14.38 x 6.38 mm  
Datasheet #0701B

### Features

- Ultra Low Phase Noise and Jitter
- Frequency Range to 2,000 MHz
- Absolute Pull Range (APR) to  $\pm 1,000$  ppm
- SONET  $\pm 20$  ppm overall free-run stability available
- High Shock Resistance, to 1000g

### Applications

- Fiber Channel
- 10 GbE
- Infiniband
- Network Processors
- SONET/SDH
- COTS/Dual use

### Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Operating Temperature Range	To		-40		+85	°C	
Storage Temperature Range	Tst		-50		+90	°C	
Supply Voltage	Vcc		-0.5		5.5	V	
Control Voltage	Vc		-0.5		5.5	V	

### Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes	
Nominal Frequency	Fo	1*	250		2,000	MHz		
Supply Voltage	Vcc	Code 0 Code A Code B	4.75 3.135 2.375	5.0 3.3 2.5	5.25 3.465 2.625	V		
Supply current	Icc	Code 0 Code A Code B			220 195 160	mA		
Output Logic Type				LVPECL Sine				
Load		Output to Vcc-2V, or Thevenin Equivalent, PECL Sine – internally AC coupled		50		Ohm		
Output Levels	Voh Vol	PECL  Sine	Vcc-1.025		Vcc-1.620	V		
Duty Cycle (Symmetry), PECL		At 50% of output voltage swing	45/55	50/50	55/45	%		
Rise/Fall Time, PECL	Tr/Tf	20 to 80, 80 to 20%		0.25	0.3	ns		
Jitter	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz RMS			0.1	0.2	ps
			100Hz to 80KHz, RMS				1.0	ps
			50 KHz to 80 MHz			0.3		ps
	Wavecrest characterized	Random period,			2.5		ps	
		Accumul., pk-to-pk Determine.			25		ps	
				1		ps		

## Electrical (cont.)

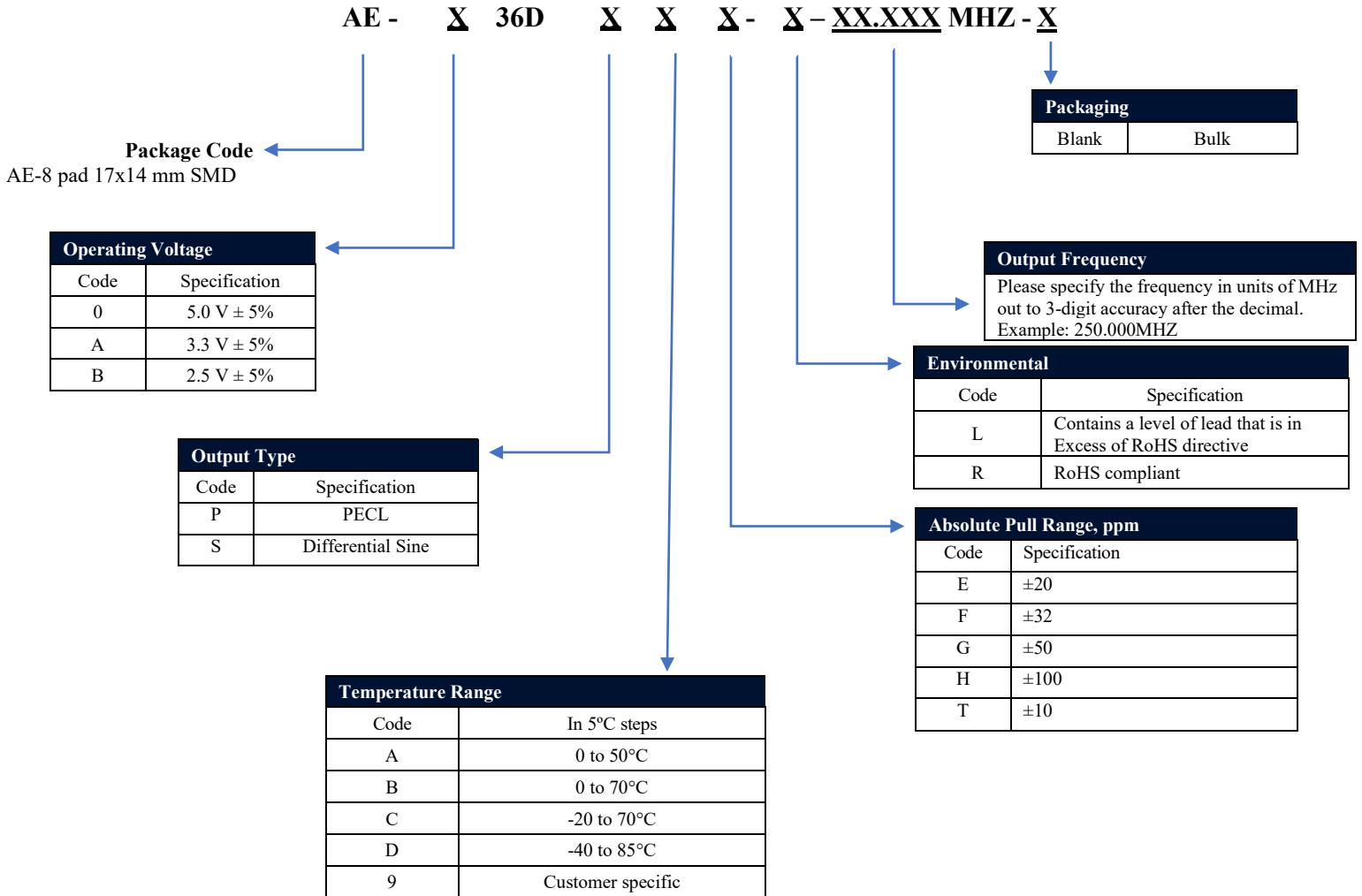
Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Phase Noise	$\mathcal{L}(\Delta f)$	1,500 MHz, APR 50 ppm or less					
		@10 Hz		-50	-45		
		@100 Hz		-80	-75		
		@1 KHz		-115	-110		
		@10KHz		-130	-125		
		@100KHz		-130	-125		
		@>1MHz		-135	-130		
Sub-harmonics		At 1,500 MHz		-50	-46	dBc	
Frequency Stability, usually not specified – unless necessary, APR is specified to incorporate stability	$\Delta F/F$	Overall, including temperature, aging 10 years, shock and vibration @Vc=Vcc/2; APR 50 ppm, or less	$\pm 20$	$\pm 30$		ppm	
Control Voltage Range	Vc		0V		Vcc	V	
Setability	Ves	Vc to set the F at Fo; T, Vcc, load – nominal, as shipped	0.4Vcc	0.5Vcc	0.6Vcc	V	
Absolute Pull Range	APR	Over all conditions, see part # creation	10, 20, 32, 50, 100			ppm	
Input impedance	Zin	@ Fmod < 100 KHz	50			KOhm	
Modulation Bandwidth		At Vc = Vcc/2, -3dB	20			KHz	

## Environmental and Mechanical

Parameter	Description
Operating temp. range	See part # table
Mechanical Shock	Per MIL-STD-202, Method 213, Cond. A
Thermal Shock	Per MIL-STD-883, Method 1011, Cond. A
Vibration	Per MIL-STD-883, Method 2007, Cond. A
Hermetic Seal	Leak rate less than $1 \times 10^{-8}$ atm.cc/s of helium, crystal only.
Soldering conditions	See MAX reflow profile below; The device may be reflowed once. Reflowing upside down in not allowed. NO CLEAN assembly is recommended.

Note: For lower frequencies, please refer to NEL AB series of VCXO

## Creating a Part Number



Not all combinations are available. Consult Factory.

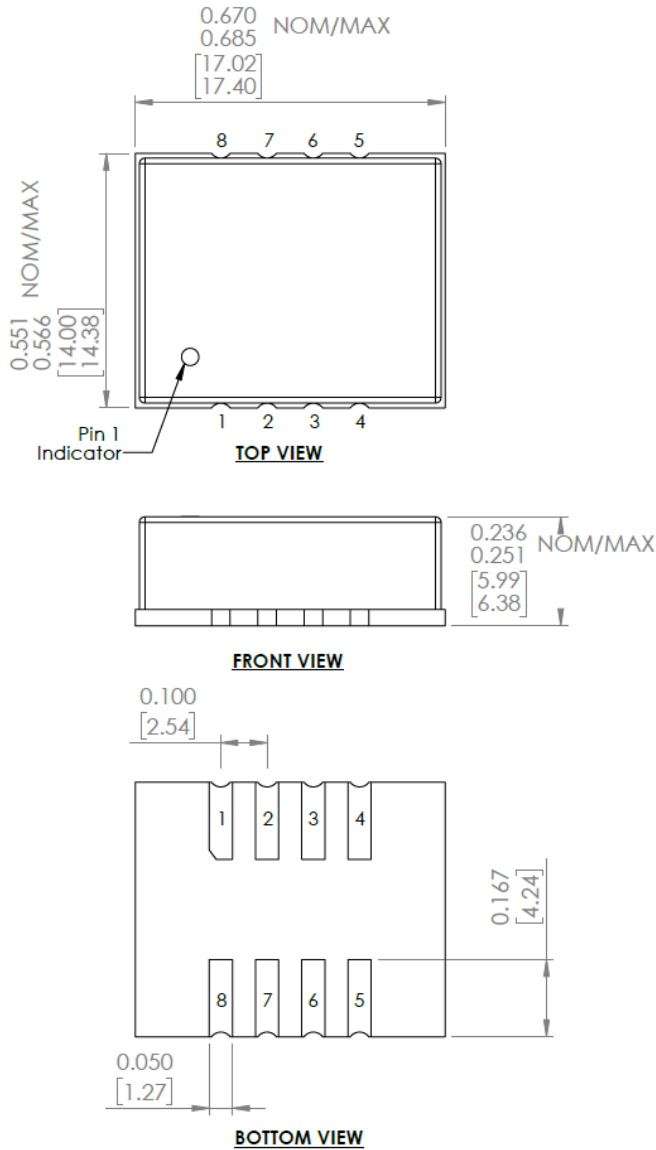
### Temperature Code Table

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		

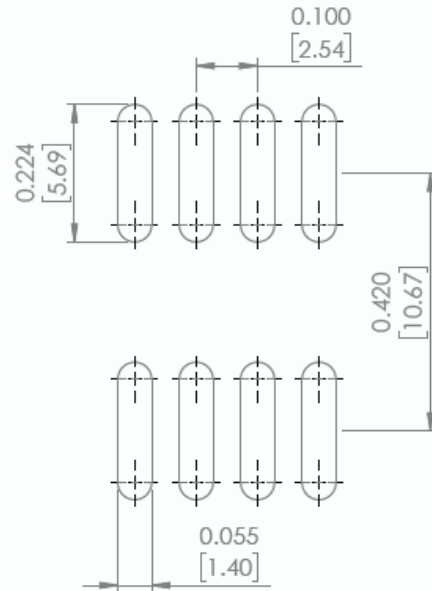
Notes:

1\* All parameters, unless noted otherwise are specified for nominal conditions, i.e.: ambient temperature is 25 °C, Vcc-nominal.

## Mechanical Dimensions



## Recommended Land Pattern

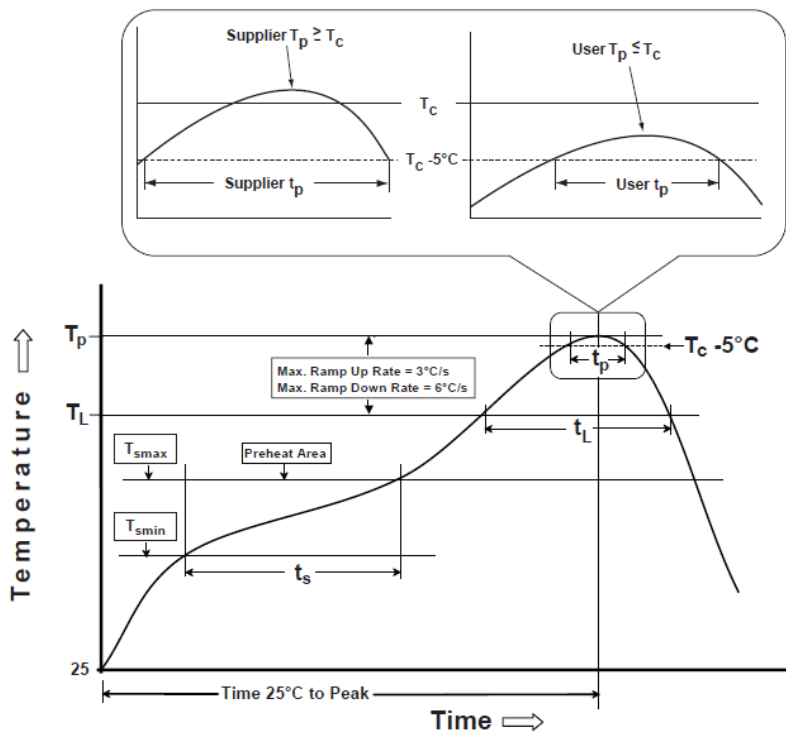


OUTLINE TOLERANCE:  
±0.015 [0.40] (UNLESS OTHERWISE SPECIFIED)

Pin #	Function
1	Vcc
2	GND
3	GND
4	GND
5	OUTPUT
6	COMP. OUTPUT
7	GND
8	Vc

Dimensions: inches [mm]

## Reflow Profile [JEDEC J-STD-020]



**Table 1**

SnPb Eutectic Process Classification Temperatures ( $T_c$ )		
Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<2.5 mm	235°C	220°C
$\geq 2.5$ mm	220°C	220°C

**Table 2**

Pb-Free Process Classification Temperatures ( $T_c$ )			
Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350-2000	Volume $\text{mm}^3$ >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 $T_p$ )	$3^\circ\text{C/sec. max}$	$3^\circ\text{C/sec. max}$
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature ( $T_p$ )*	<b>see Table 1</b>	<b>see Table 2</b>
Time ( $t_p$ )** within $5^\circ\text{C}$ of the specified classification ( $T_c$ )	20 sec.	30 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	$6^\circ\text{C/sec. max}$	$6^\circ\text{C/sec. max}$
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.