

AN-X29UXXX-X Series HF Differential Square Wave

Rev. N

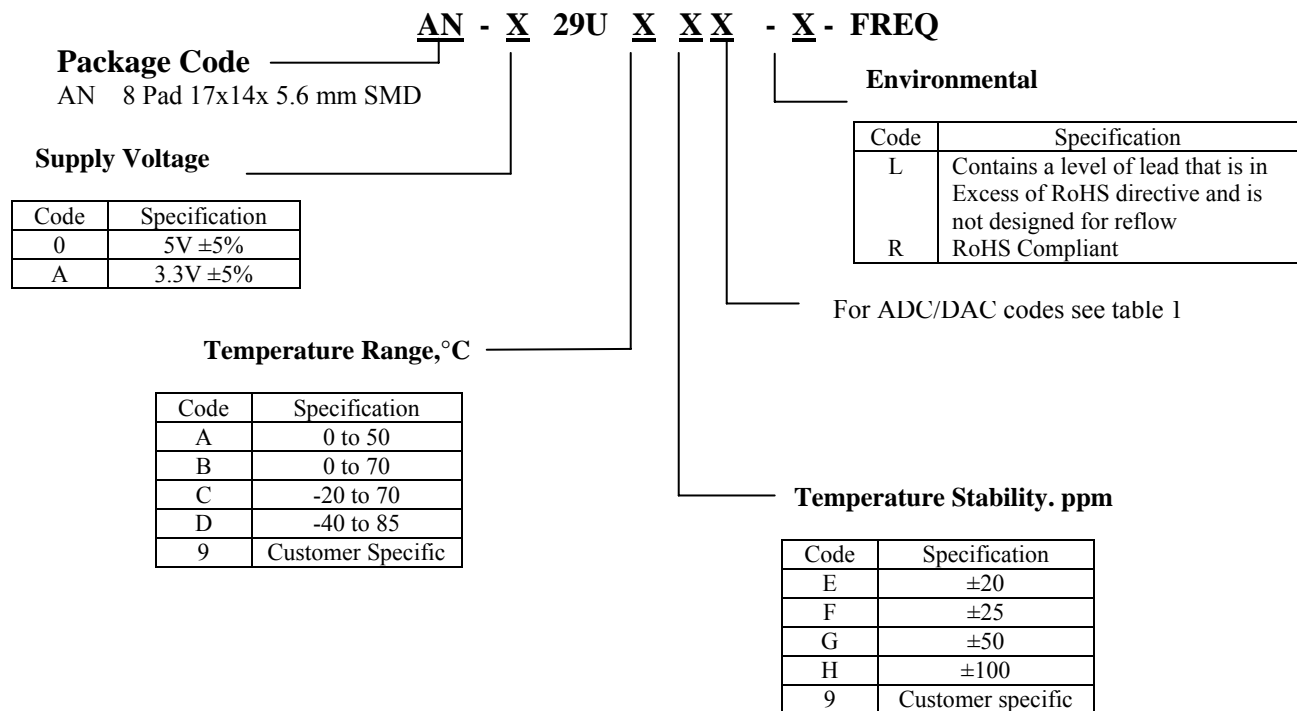
For use with High Sample rate analog-to-digital converters (ADC) and digital-to-analog converters (DAC)

Description The **AN-X29UXXX Series** of crystal oscillators (XO) provides high frequency AC coupled high slew rate square-wave differential output. The device provides exceptionally low Phase Noise and Jitter.

Applications and Features

- High speed Analog-to-Digital Converter clock source
- High slew rate waveform edges minimize the slope dependent ADC jitter and ADC uncertainty
- Output characterized to match specified ADC or DAC clock input conditions
- Ideal for use with high sample rate ADC and DAC Applications
- Lowest Jitter Solution - Exceptionally low phase noise reference and ultra low jitter clock source
- High reliability – NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Extremely low phase noise and jitter
- High shock resistance, to 1000g
- COTS/Dual use

Creating a Part Number



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Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Operating Temperature Range	To	-40 to +85	°C
Storage Temperature Range	Tst	-50 to +90	°C
Supply Voltage	Vcc	-0.5 to 5.5	V

Electrical Parameters (1)

Parameter		Symb	Conditions, Note	MIN	TYP	MAX	Unit
Nominal Frequency		Fo		10		500	MHz
Supply Voltage		Vcc	Code 0 Code A	4.75 3.135	5.0 3.3	5.25 3.465	V
Supply current		Icc	Code 0 Code A			150 125	mA
Output Logic Type			AC coupled		Differential Square Wave		
Load			Per ADC or DAC specification				
Output Levels		Vod	Differential amplitude peak-peak	1.0	1.5	2.0	V
Slew Rate			At 50% of output voltage swing	1.8	2.0		V/ns
Jitter	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz, RMS	250MHz	0.1	0.15	ps
				500MHz	0.14	0.2	
			Deterministic, Peak-to-peak	500MHz	4		
Sub-harmonics			* F>250 MHz		-50	-45	dBc
Phase Noise		f(Δf)	250 MHz	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz	-50 -80 -120 -150 -152 -152	-45 -75 -110 -140 -152 -152	dBc/Hz
Phase Noise		f(Δf)	500MHz	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz	-60 -90 -118 -135 -140 -145	-55 -85 -113 -130 -135 -140	
Frequency Stability		ΔF/F	Overall, including temperature, aging 10 years, shock and vibration		±50	±100	ppm

Notes:

* Usually, to achieve frequency higher than 250 MHz Low Noise analog multiplication technique is used. As a rule the multiplication factor is odd number. If the frequency of sub-harmonic and its multiples is important for the application, customer is encouraged to specify multiplication factor for F > 250 MHz.

1. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.

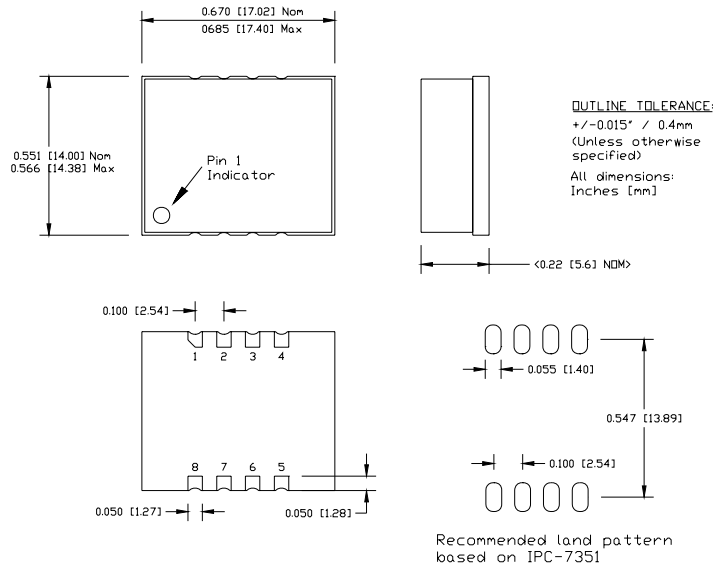


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Environmental and Mechanical

Operating temp. range	See creating a p/n chart
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	260°C for 10 s leads only; The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.
Hermetic Seal	Leak rate less than 5×10^{-8} atm.cc/s of helium



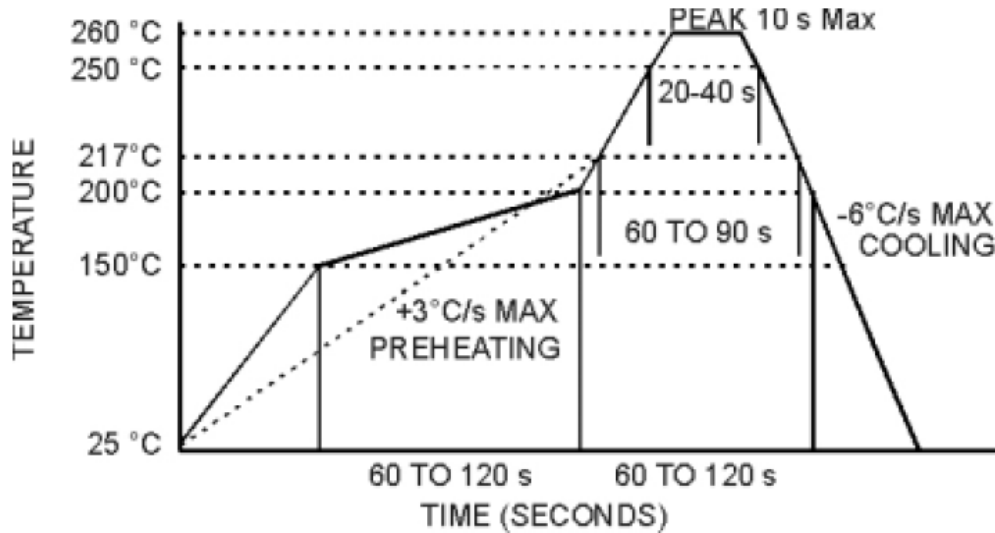
Electrical Connections

Pin Out	Pin 1=Vcc; Pin 2=GND; Pin 3=GND; Pin 4=GND; Pin 5=Output; Pin 6=Compl Output; Pin 7 = GND; Pin 8=N/C
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Maximum solder reflow profile



The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.

Table 1: ADC/DAC Code list

<u>Code</u>	<u>Output type</u>	<u>Load</u>	<u>Output voltage</u>	<u>ADC/DAC</u>
A	AC coupled	1 kohm min	1Vmin to 2V max Peak to peak	Analog Devices AD9054A, AD9211, AD9230,AD9233, AD9246, AD9254, AD9430, AD9461, AD9480, AD9481, AD9627, AD9640, AD9704 ⁽¹⁾ , AD9705 ⁽¹⁾ ,AD9706 ⁽¹⁾ ,AD9707 ⁽¹⁾ , AD9740 ⁽¹⁾ ,AD9742 ⁽¹⁾ ,AD9744 ⁽¹⁾ , AD9748 ⁽¹⁾ ,AD9751 ⁽¹⁾ ,AD9753 ⁽¹⁾ , AD9755 ⁽¹⁾ , AD9772A ⁽¹⁾ ,Linear Tech LTC2209, Maxim MAX105, MAX107, MAX5886, MAX5887, MAX5888, MAX5889, MAX5890, MAX5891, MAX5893, MAX5894, MAX5895, MAX5898 , TI ADS5440, ADS5444, ADS5463, ADS5474, ADS5500, ADS5520, ADS5521,ADS5527 Kenet KAD5510P-50, KAD5512P-12, KAD5512P-17, KAD5512P-21, KAD5512P-25, KAD5512P-50, KAD5514P-12, KAD5514P-17, KAD5514P-21, KAD5514P-25, KAD2710L-27, KAD2710C-27, KAD2710L-21, KAD2710C-21, KAD2710L-17, KAD2710C-17, KAD2710L-10, KAD2710C-10, KAD2708L-27, KAD2708C-27, KAD2708L-21, KAD2708C-21,

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				KAD2708L-17, KAD2708C-17, KAD2708L-10, KAD2708C-10, KAD2708L-35, KAD5610P-12, KAD5610P-17, KAD5610P-21, KAD5610P-25, KAD5612P-12, KAD5612P-17, KAD5612P-21, KAD5612P-25
B	DPECL	50 ohms	0.6V to 1.2V	Maxim MAX104, MAX106, MAX108, MAX109, MAX555, Teledyne RDA012, RDA012M4, RDA012M4MS, RDA012RZ, RDA112RZ, Analog Devices AD9726 ⁽²⁾
C	AC coupled	5 kohm min	0.4Vmin to 1V max Peak to Peak	Maxim MAX1121, MAX1122, MAX1123, MAX1124, MAX1213, MAX1213N, MAX1214, MAX1214N, MAX1215, MAX1215N, MAX1217, MAX1218, MAX1219, MAX19541, MAX19542, TI ADS5525, ADS5545, ADS5546, ADS5547, ADS6424, ADS6425, ADS6444, ADS6445
D	AC coupled	100 ohm	0.4Vmin to 1.6V max Peak to Peak	Analog Devices AD12401, AD9741 ⁽³⁾ , AD9743 ⁽³⁾ , AD9745 ⁽³⁾ AD9746 ⁽³⁾ , AD9747 ⁽³⁾ , AD9776 ⁽³⁾ AD9746A ⁽³⁾ , AD9778 ⁽³⁾ , AD9778A ⁽³⁾ , AD9779 ⁽³⁾ , AD9779A ⁽³⁾ , National Semiconductor ADC081000, ADC081500, ADC082500, ADC083000, ADC08500, ADC08B3000, ADC08D1000, ADC08D1500, ADC08D500

Notes:

- (1) Required common mode bias level external to the oscillator and DAC per DAC data sheet.
- (2) External bias and 50 ohm load required per DAC data sheet.
- (3) Required load resistors and bias of 400 mVolts to be supplied between oscillator and DAC per DAC data sheet.



**FREQUENCY
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