

Helping Customers Innovate, Improve & Grow



Vectron offers a High Temperature Crystal Oscillator (PX-420) product platform for extreme environment applications. Typical operating temperature range is from -55°C to +230°C with a frequency stability of +/- 250 ppm over the entire operating temperature range.

Vectron's vertical integration in the following technical areas ensures the ability to design and manufacture state of the art high temperature frequency control products:

- BAW & SAW Design & Fabrication to produce high quality resonators.
- RF Oscillator Circuit Design.
- Established 250°C High Temperature Electronics Packaging Expertise.
- Established 250°C High Temperature Electronics Assembly & Test Expertise.
- Environmental Screening.

Vectron's manufacturing processes, from quartz resonator fabrication to oscillator electronics assembly and test, are painstakingly controlled via ISO and SPC procedures. Vectron fabricates high temperature quartz resonators using proprietary manufacturing processes designed specifically for high temperature and harsh environment applications. In order to ensure high reliability in the field, critical electrode metallization and testing processes are conducted inside state-of-the-art Class 1K cleanrooms, while oscillator assembly is conducted in Class 10K cleanrooms. All high temperature oscillators are 100% tested before delivery.

Features

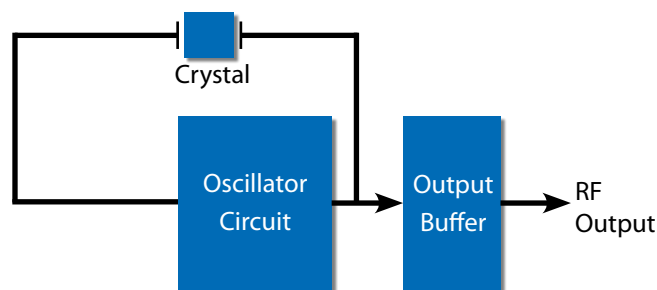
- Continuous operating temperature range -55°C to 230°C
- Low jitter and phase noise
- 3.3 Vdc or 5 Vdc operation
- 4-Point crystal mount for Harsh Environment Applications
- High Shock and Vibration Survival
- Output frequency 500 KHz to 40 MHz standard (see HT RTCXO datasheet for 32.768 KHz requirements)
- Standard 4 pin 1/2 DIP package
- Product is free of lead and compliant to EC RoHS directive
- Made in USA

Applications

- Oil / Gas downhole tool
- Geophysical services
- High temperature industrial process control
- Extended temperature Military/Aerospace
- Avionics
- Engine control



Block Diagram



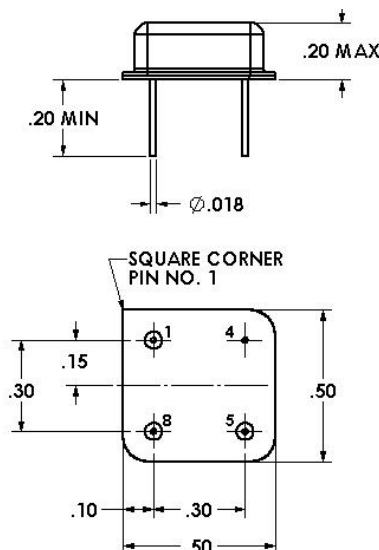
Performance Specifications

Specification Parameters	Values	
Frequency Range	500KHz to 40MHz (see HT RTCXO datasheet for 32.768KHz requirements)	
Supply (Vdd)	+5.0Vdc ±5% (D) +3.3Vdc ±5% (E)	
Current	5mA typical @ 20MHz, 3.3V	
Level "0" & "1"	<0.4V / >Vdd - 0.5V	
Output	HCMOS compatibility (A)	
Rise & Fall Time	1ns typical / 5ns Max	
Symmetry	40/60%	
Operating Temperature	-55°C to +125°C (C) 0°C to +150°C (1) -20°C to +180°C (Z) -55°C to +180°C (Y)	0°C to +200°C (2) 0°C to +230°C (3) (other custom temperature ranges are available, consult factory)
Jitter (12kHz - 20MHz)	<0.5ps	
Phase Noise (typical @20MHz, HCMOS, 3.3V)	10Hz -70 dBc/Hz 100Hz -105 dBc/Hz 1kHz -130 dBc/Hz	10kHz -145 dBc/Hz 100kHz -155 dBc/Hz 1MHz -155 dBc/Hz
Temperature Stability	±40ppm (J) ±50ppm (K) ±100ppm (S)	±250ppm (W) ±350ppm (Y)
Package Size	0.5" x 0.5" x 0.2" 4 pin ½ DIP resistance welded	
Storage Temperature	-55°C to +125°C	

Environmental Compliance

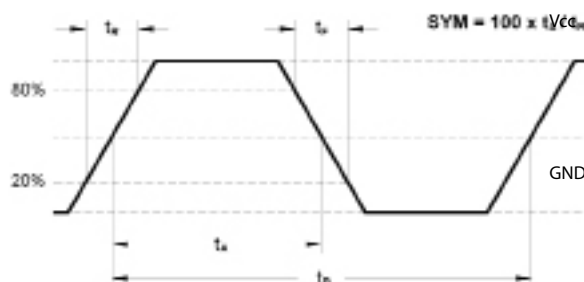
Environmental Compliance		
Vibration-Sine	20g to 2kHz Sine	MIL-STD-202 Method 204 Condition D
Vibration-Random	20grms to 2kHz Random	MIL-STD-202 Method 214 Condition I-F
Shock	1000g, 0.5ms	MIL-STD-202 Method 213 Condition E
Seal Test	Fine	MIL-STD-883 Method 1014 Condition A2
Seal Test	Gross	MIL-STD-202 Method 112 Condition D
Temperature Cycling	10 Cycles minimum	MIL-STD-883 Method 1010 Condition B
Acceleration	5000g Y1 axis	MIL-STD-883 Method 2001 Condition A

Physical Specifications

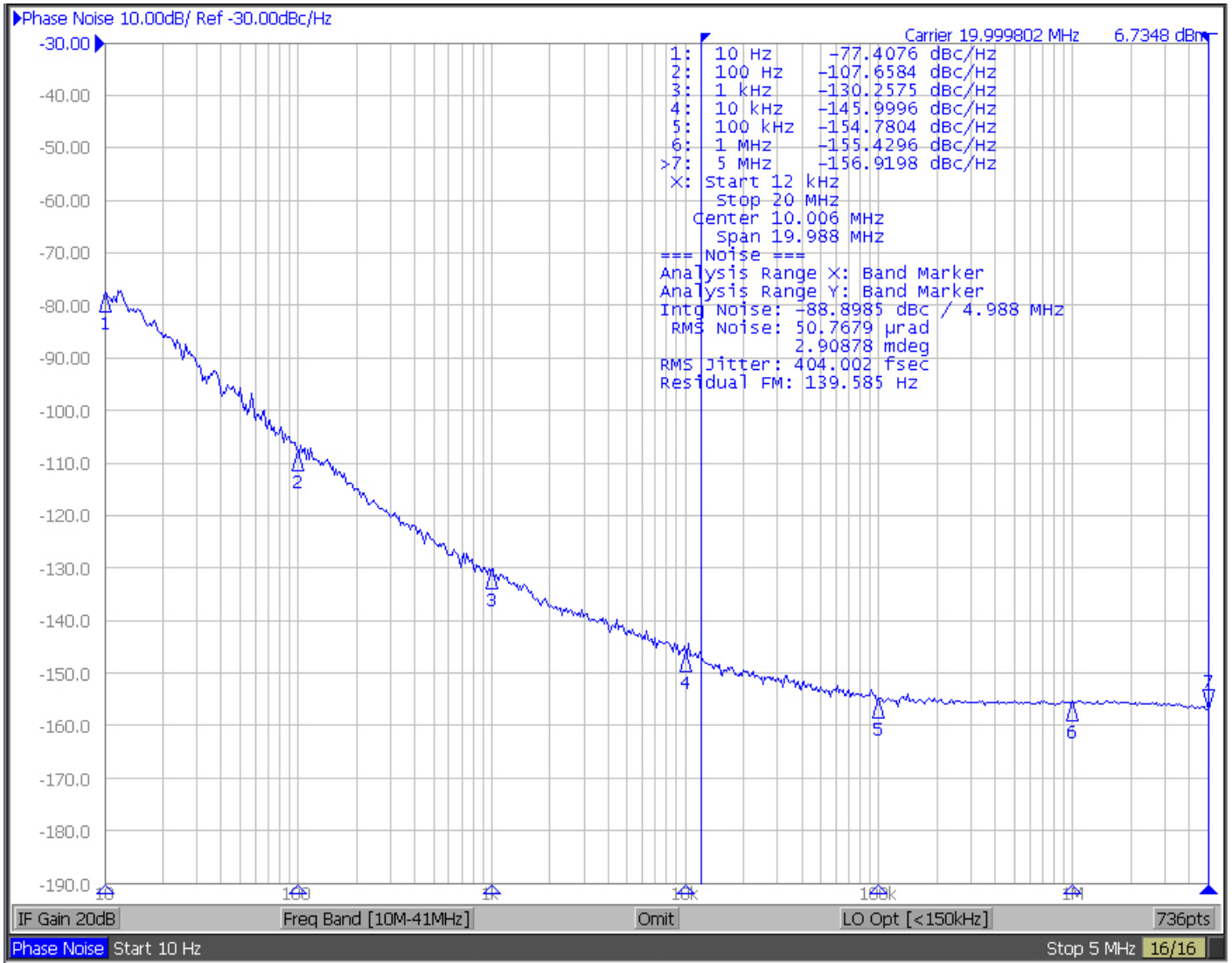


Dimensions in inches

Pin	Function
1	Enable/Disable option
4	Case & Electrical Ground
5	RF Output
8	V _{CC} Power Supply Voltage



Phase Noise Performance



Standard Frequency List							
32.768kHz *	512.000kHz	1.000MHz	1.024MHz	2.000MHz	2.048MHz	3.686MHz	4.000MHz
4.096MHz	5.000MHz	7.3728MHz	8.000MHz	8.192MHz	10.000MHz	12.000MHz	16.000MHz
16.384MHz	20.000MHz	24.000MHz	32.000MHz	32.768MHz	40.000MHz		

* Refer to High Temperature Low Power Real Time Clock Oscillators datasheet for 32.768kHz frequency applications.

Ordering Information

PX - 420 0 - D A Y - W X X X - 10M0000000

Product Family
High Temp Products

Package Type
420: 4 pin 1/2 DIP

Factory Use

Supply Voltage
D: 5.0V ±5%
E: 3.3V ±5%

Output
A: HCMOS/ACMOS

Frequency

Screening
B: "B" Level Screening
X: No Screening

Accuracy
F: ±25ppm
X: No Accuracy Code

Enable
A: Enable Hi, Tristate
C: Enable Low, Tristate
D: Enable Low
X: No Enable

Temp Stability (PX)
J: ± 40ppm
S: ± 100ppm
U: ± 150ppm
V: ± 200ppm
W: ± 250ppm
Y: ± 350ppm

Temperature Range
1: 0°C to 150°C
Z: -20°C to 180°C
Y: -55°C to 180°C
2: 0°C to 200°C
5: -55°C to 200°C
3: 0°C to 230°C
6: -55°C to 230°C

Temperature Range and Stability Table		
Temp Range	Temp Stability	PX-420
1: 0°C to 150°C	J: ± 40ppm	Tight Stability
	S: ± 100ppm	Tight Stability
	U: ± 150ppm	Standard
	W: ± 250ppm	Standard
Z: -20°C to 180°C	J: ± 40ppm	Tight Stability
	S: ± 100ppm	Tight Stability
	U: ± 150ppm	Standard
	W: ± 250ppm	Standard
Y: -55°C to 180°C	S: ± 100ppm	Tight Stability
	U: ± 150ppm	Standard
	W: ± 250ppm	Standard
2: 0°C to 200°C	S: ± 100ppm	Tight Stability
	U: ± 150ppm	Tight Stability
	V: ± 200ppm	Standard
	W: ± 250ppm	Standard
5: -55°C to 200°C	S: ± 100ppm	Tight Stability
	U: ± 150ppm	Tight Stability
	V: ± 200ppm	Standard
	W: ± 250ppm	Standard
3: 0°C to 230°C	V: ± 200ppm	Tight Stability
	W: ± 250ppm	Tight Stability
	Y: ± 350ppm	Standard
6: -55°C to 230°C	V: ± 200ppm	Tight Stability
	W: ± 250ppm	Tight Stability
	Y: ± 350ppm	Standard

**Note: not all combination of options are available. Other specifications may be available upon request.*

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