

## 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.

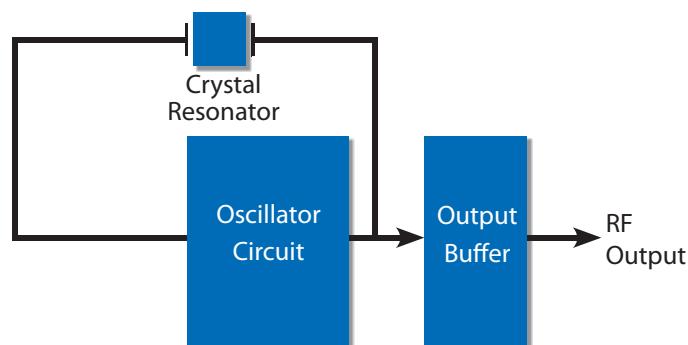
### Features

- Continuous operating temperature range -55°C to 230°C
- Low jitter and phase noise
- 3.3Vdc or 5Vdc operation
- Compliant crystal mount for high shock & vibration
- Output frequency 10MHz to 40MHz standard
- Standard 4 pin ½ DIP package

### Applications

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

### Block Diagram



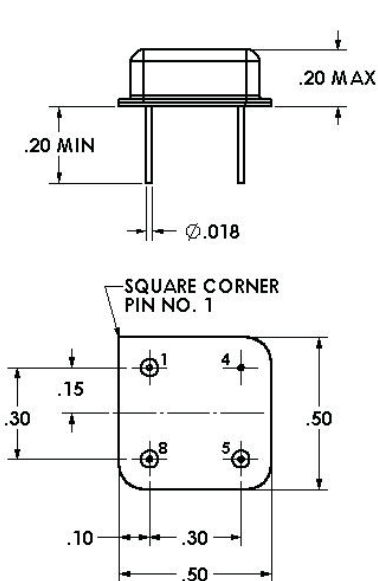
## Performance Specifications

Specification Parameters	Values	
Frequency Range	32.768KHz to 40MHz	
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

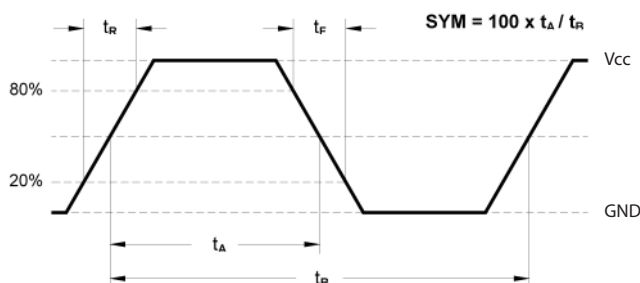
Vibration-Sine	20g to 2kHz Sine	MIL-STD-202 Method 204 Condition D
Vibration-Random	20grms to 2kHz Random	MIL-STD-202 Method 214 Condition I-F
Shock	1000g, 0.5ms	MIL-STD-202 Method 213 Condition E
Seal Test	Fine	MIL-STD-883 Method 1014 Condition A2
Seal Test	Gross	MIL-STD-202 Method 112 Condition D
Temperature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

## Physical Specifications

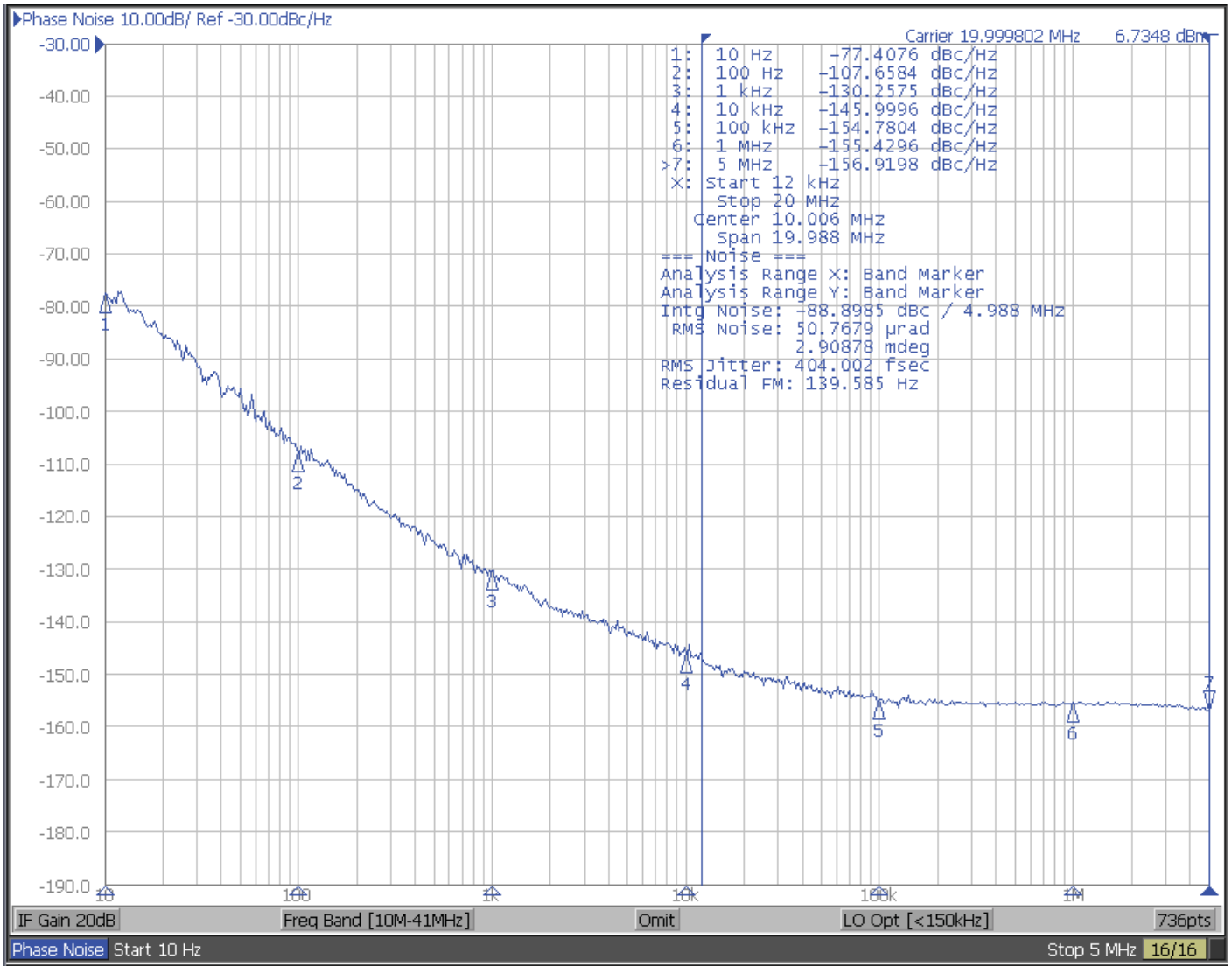


Dimensions in inches

Pin	Function
1	Enable/Disable option
4	Case & Electrical Ground
5	RF Output
8	V <sub>CC</sub> Power Supply Voltage



# Phase Noise Performance



## Ordering Information

**PX - 420 0 - DAY - 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  
K: ±50ppm  
S: ± 100ppm  
W: ± 250ppm  
Y: ± 350ppm

**Temperature Range**  
C: -55°C to 125°C  
1: 0°C to 150°C  
Z: -20°C to 180°C  
Y: -55°C to 180°C  
2: 0°C to 200°C  
3: 0°C to 230°C

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

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