

## Helping Customers Innovate, Improve & Grow



PX-702


Vectron offers a small footprint High Temperature Ceramic SMD Crystal Oscillator (PX-702) product platform for extreme environment applications. In addition to its wide operating temperature range, PX-702 HTXO is also ideal for high shock & vibration applications. PX-702 HTXO is also designed to exceed 3000g shock and 30g vibration levels of the demanding MIL-STD-202 requirements.

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.

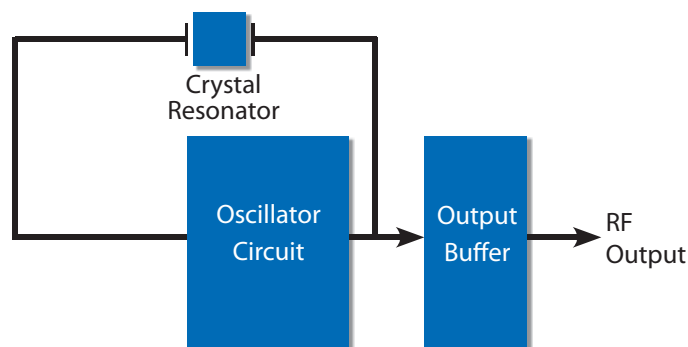
### Features

- **Continuous operating temperature range -55°C to 230°C**
- **1.8, 2.5, 3.3 or 5.0 Vdc operation**
- **Design for high shock & vibration to exceed 3000g shock & 30g vibration**
- **Output frequency 32.768kHz to 40MHz standard**
- **Standard 5 x 7 x 1.8 mm SMD package**
- **Product is free of lead and compliant to EC RoHS directive** 

### Applications

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

### Block Diagram

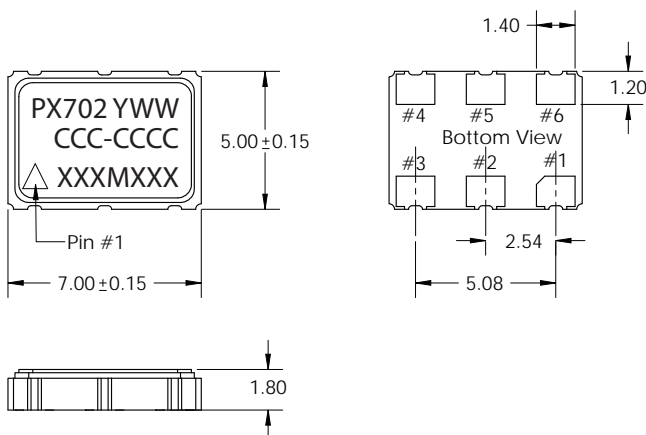


## Performance Specifications

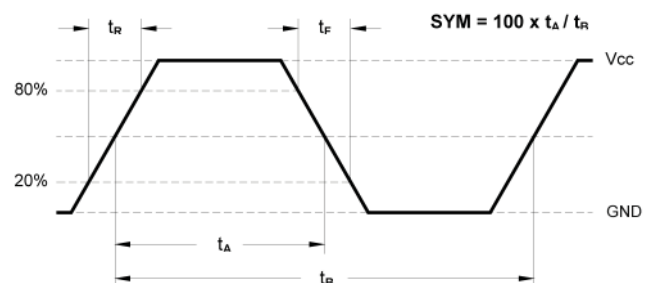
Specification Parameters	Values	
Frequency Range	32KHz to 40MHz	
Supply (Vdd)	+3.3Vdc ±5% (E) +5.0Vdc ±5% (D)	+1.8Vdc ±5% (J) +2.5Vdc ±5% (H)
Current	5mA typical @ 20MHz, 3.3V	
Level "0" & "1"	<0.4V / >Vdd - 0.5V	
Output	HCMOS compatibility (A)	
Rise & Fall Time	1ns typical / 3ns Max	
Symmetry	40/60%	
Operating Temperature	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 -110 dBc/Hz 1kHz -135 dBc/Hz 10kHz -150 dBc/Hz 100kHz -160 dBc/Hz 1MHz -160 dBc/Hz	
Temperature Stability	±150ppm (U) ±250ppm (W) ±300ppm (Y)	
Package Size	5.0 x 7.0 x 1.8 mm SMD Ceramic	
Storage Temperature	-55°C to +125°C	

## Physical Specifications and Marking

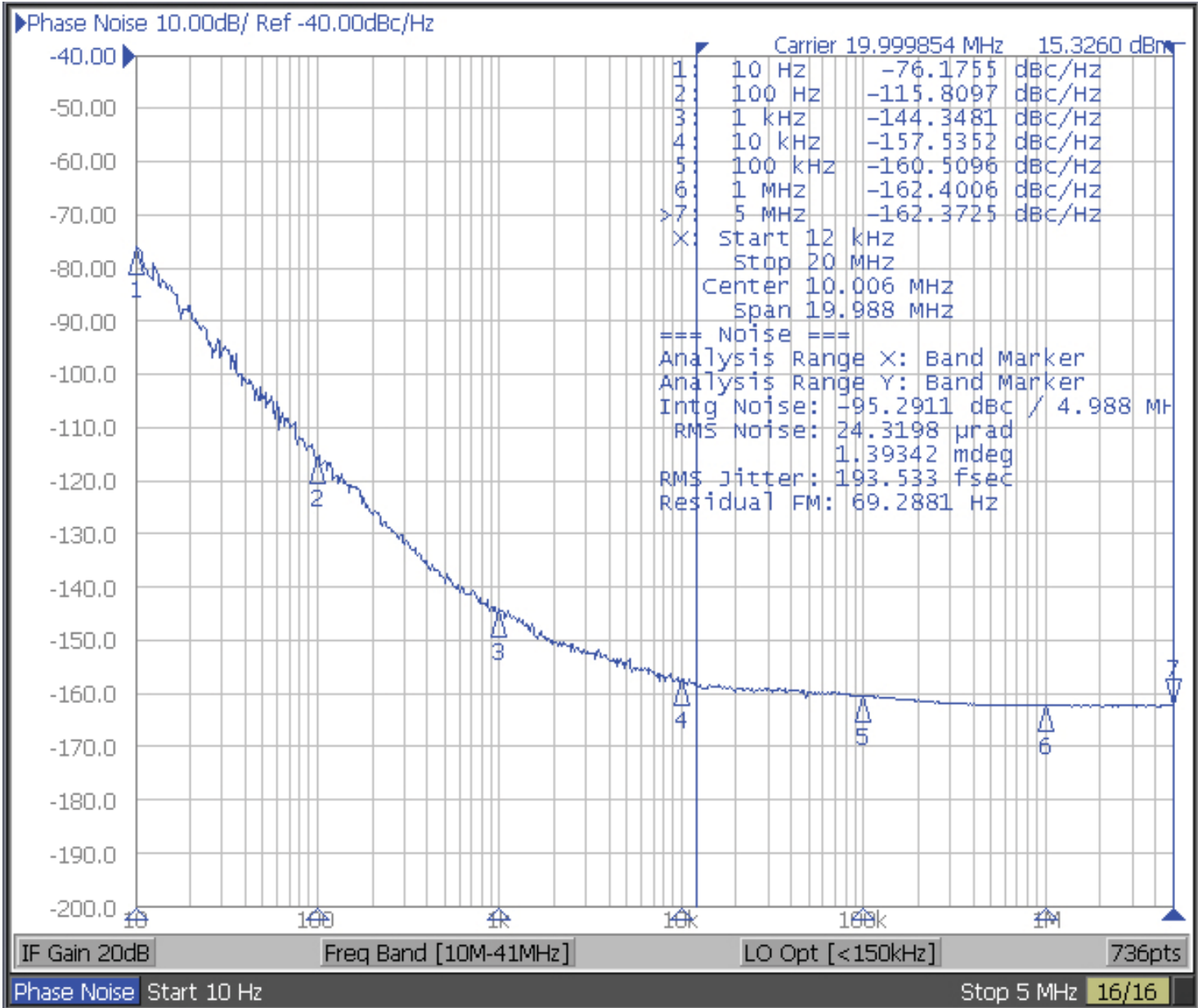
Dimensions in (mm)



Pin	Function
1	Enable/Disable option
2	No Connection
3	Case & Electrical Ground
4	RF Output
5	No Connection
6	V <sub>CC</sub> Power Supply Voltage



# Phase Noise Performance



## Environmental Compliance

Vibration-Sine	30g, 10 to 2kHz Sine	MIL-STD-202G Method 204 Condition G
Vibration-Random	30grms, 10 to 2kHz Random	MIL-STD-202G Method 214 Condition I-H
Shock	3000g, 0.3ms	MIL-STD-202 Method 213
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

### 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		

## Ordering Information

**PX - 702 0 - E A Y - W X X X - 20M0000000**

**Product Family**  
Crystal Oscillator

**Package Type**  
702: 5x7 mm HTCC

**Factory Use**

**Supply Voltage**  
E: 3.3V ±5%  
D: 5.0V ±5%  
J: 1.8V ±5%  
H: 2.5V ±5%

**Output**  
A: HCMOS/ACMOS

**Frequency**

**Factory Use**

**Factory Use**

**Enable**

A: Enable Hi, Tristate  
X: No Enable

**Temp Stability (PX)**

U: ± 150ppm  
W: ± 250ppm  
Y: ± 300ppm

**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  
3: 0°C to 230°C

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

## For Additional Information, Please Contact

### USA:

Vectron International  
267 Lowell Road  
Hudson, NH 03051  
Tel: 1.888.328.7661  
Fax: 1.888.329.8328

### Europe:

Vectron International  
Landstrasse, D-74924  
Neckarbischofsheim, Germany  
Tel: +49 (0) 3328.4784.17  
Fax: +49 (0) 3328.4784.30

### Asia:

Vectron International  
1589 Century Avenue, the 19th Floor  
Chamtime International Financial Center  
Shanghai, China  
Tel: 86.21.60812888  
Fax: 86.21.61633598

### Disclaimer

Vectron International reserves the right to make changes to the product(s) and or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Rev: 11/2008