

Helping Customers Innovate, Improve & Grow



Vectron offers a High Temperature Crystal Oscillator (PX-570) product platform for extreme environment applications. In addition to its wide operating temperature range, PX-570 HTXO is also ideal for high shock & vibration applications. PX-570's unique package design offers small ceramic package footprint, as well as providing both through-hole mounting and surface mount options.

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

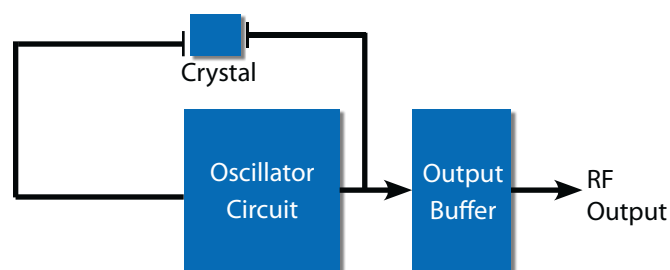
- Continuous operating temperature range -55°C to 230°C
- 1.8 Vdc, 2.5 Vdc, 3.3 Vdc or 5 Vdc operation
- 3 Lead options for Thru-hole and SMD
- 4-Point crystal mount for Harsh Environment Applications
- High Shock and Vibration Survival
- Output frequency 500 KHz to 40 MHz standard (see HT RTC XO datasheet for 32.768 KHz requirements)
- 8.0 mm x 8.5 mm x 2.9 mm ceramic leaded package
- 6 lead package standard (contact factory for 4 lead package requirements)
- RoHs Compliant
- 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

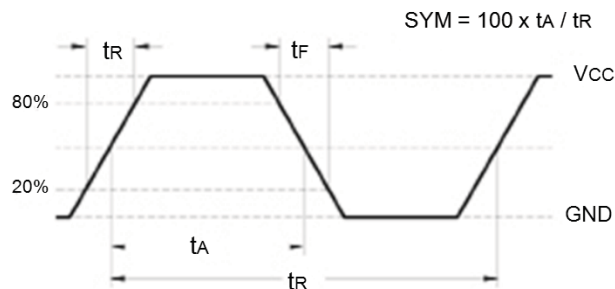
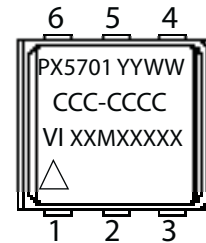
| Specification Parameters                  | Values  |  |
|---|---|--|
| Frequency Range                           | 500kHz to 40MHz (see HT RTCXO datasheet for 32.768KHz requirements)   |  |
| Supply (Vdd)                              | +5.0Vdc ±5% (D)<br>+3.3Vdc ±5% (E)  | +2.5Vdc ±5% (H)<br>+1.8Vdc ±5% (J)   |
| Current                                   | 5mA typical @ 20MHz, 3.3V (low current option is available, consult factory)                                |  |
| Level "0" & "1"                           | <0.4V / >Vdd - 0.5V   |  |
| Output                                    | HCMOS compatibility (A)   |  |
| Rise & Fall Time                          | 1.5ns typical / 5ns Max (Typical @20Mhz, HCMOS, 3.3V)   |  |
| Symmetry                                  | 40/60%  |  |
| Operating Temperature                     | 0°C to +150°C (1)<br>-20°C to +180°C (Z)<br>-55°C to +180°C (Y)<br>0°C to +200°C (2)<br>-55°C to +200°C (5) | 0°C to +230°C (3)<br>-55°C to +230°C (6)<br>(other custom temperature ranges are available, consult factory) |
| Jitter (12kHz - 20MHz)                    | <0.5ps  |  |
| Phase Noise (Typical @40MHz, HCMOS, 3.3V) | 10Hz -70 dBc/Hz<br>100Hz -100 dBc/Hz<br>1kHz -128 dBc/Hz  | 10kHz -143 dBc/Hz<br>100kHz -150 dBc/Hz<br>1MHz -150 dBc/Hz  |
| Temperature Stability                     | ±40ppm (J)<br>±100ppm (S)<br>±150ppm (U)  | ±200ppm (V)<br>±250ppm (W)<br>±350ppm (Y)  |
| Package Size (mm)                         | 8.0 x 8.5 x 2.9 (Thru-Hole, Gull-Wing and Inward L Wing options)  |  |
| Storage Temperature                       | -55°C to +125°C   |  |

### Environmental Compliance

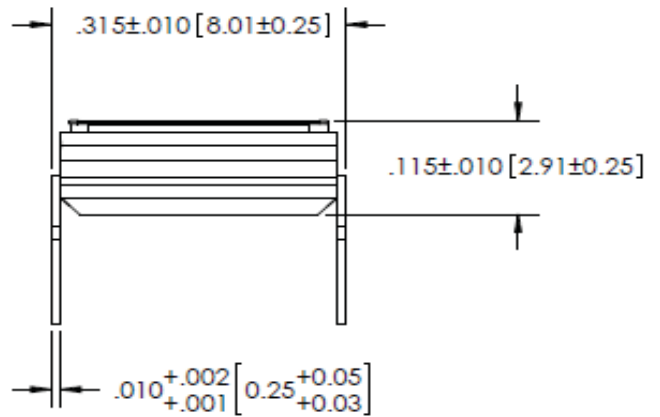
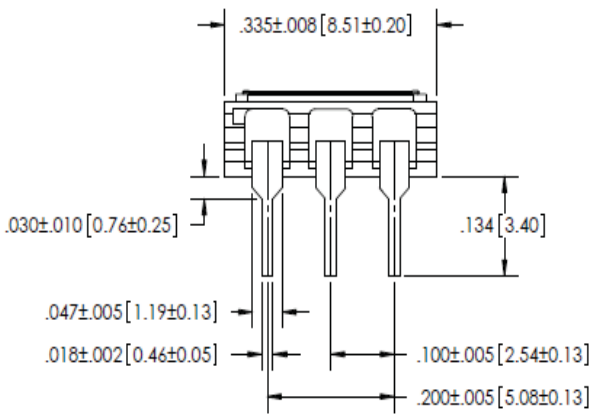
|                     |                             |                                      |
|---------------------|-----------------------------|--------------------------------------|
| Vibration-Sine      | 20g, 10Hz to 2kHz Sine      | MIL-STD-202 Method 204 Condition D   |
| Vibration-Random    | 20grms, 10Hz 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 and Marking

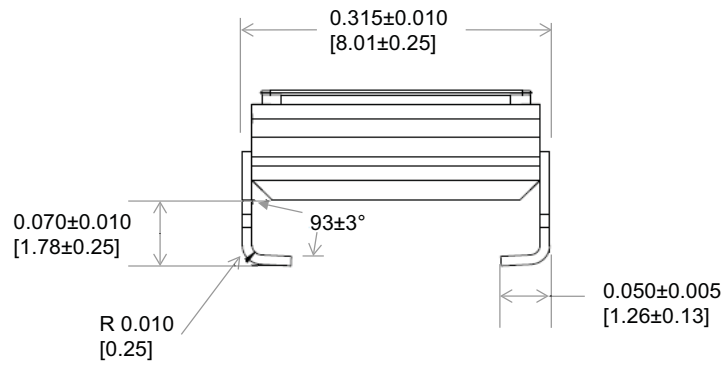
| Pin | Function                 |
|-----|--------------------------|
| 1   | Enable/Disable option    |
| 2   | No Connection            |
| 3   | Case & Electrical Ground |
| 4   | RF Output                |
| 5   | No Connection            |
| 6   | Vdd Power Supply Voltage |



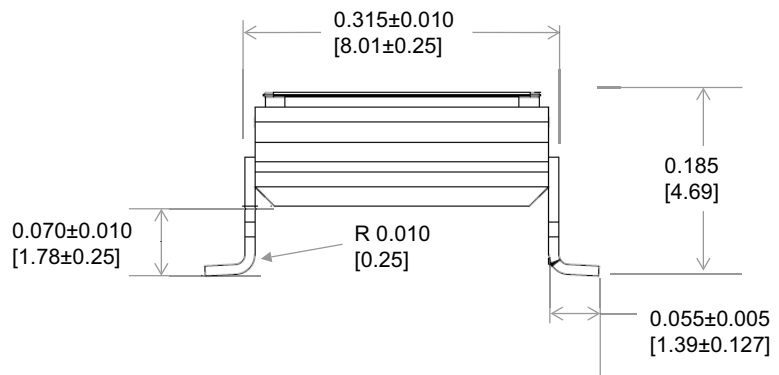
**Thru-Hole option**



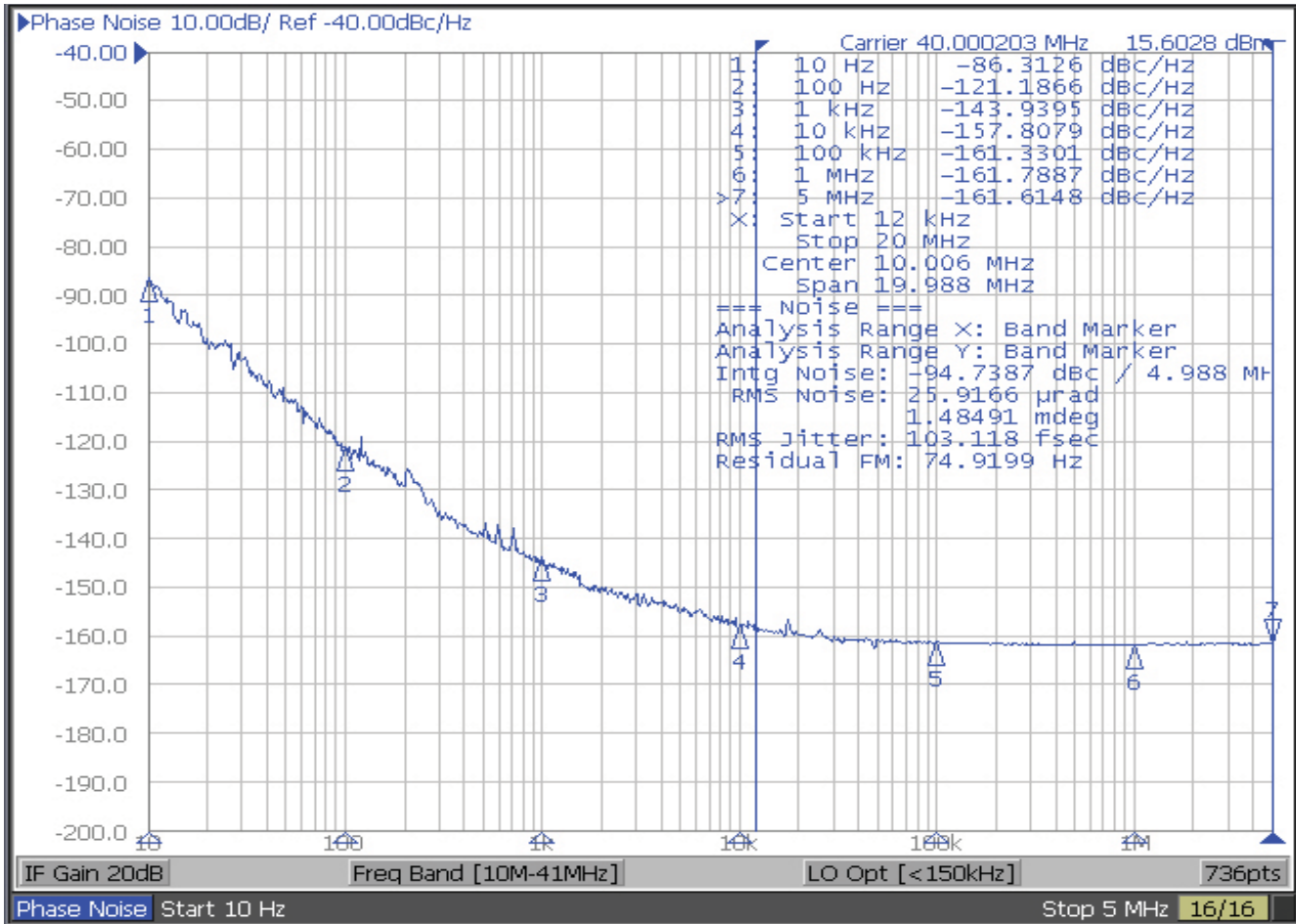
**Inward L-Wing option**



**Gull-Wing option**



# Typical 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 | 25.000MHz | 26.000MHz | 32.000MHz | 32.768MHz | 40.000MHz |
| 48.000MHz |            |           |           |           |           |           |           |

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

# Ordering Information

**PX - 570 1 - D A Y - V X X X - 10M000000**

**Product Family**  
High Temp Products

**Package Type**  
570: 8 x 9 mm

**Lead Options**  
1: 6 lead Thru Hole  
2: 6 lead Gull Wing  
3: 6 lead Inward L

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

**Output**  
A: HCMOS/ACMOS

**Frequency**

**Factory Use**

**Factory Use**

**Enable**

A: Enable Hi, Tristate  
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

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

| Temperature Range and Stability Table |                |                 |
|---------------------------------------|----------------|-----------------|
| Temp Range                            | Temp Stability | PX-570          |
| 1: 0°C to 150°C                       | J: ± 40ppm     | Tight Stability |
|                                       | S: ± 100ppm    | Standard        |
|                                       | 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        |

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