

## Helping Customers Innovate, Improve & Grow



Vectron offers a High Temperature Voltage Control Crystal Oscillator (VX-400) product platform for extreme environment applications. Typical operating temperature range is from -55°C to +180°C with an absolute pull range of +/- 50 ppm.

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.

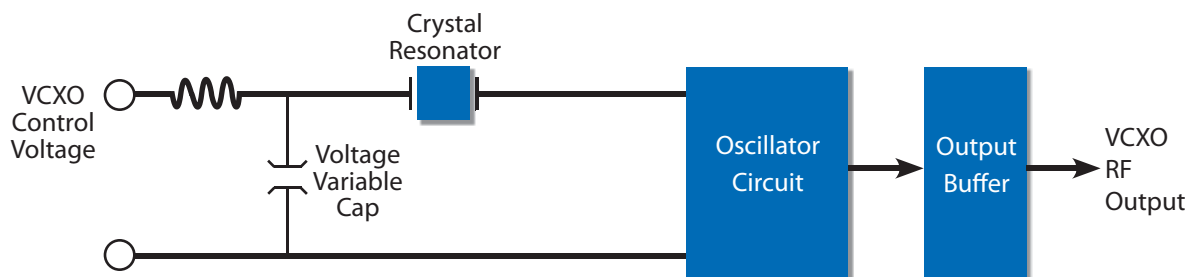
### Features

- Continuous operating temperature range -55°C to 180°C
- Low jitter and phase noise
- 3.3Vdc or 5Vdc operation
- Compliant crystal mount for high shock & vibration
- Output frequency 10MHz to 30MHz standard
- Standard 4 pin DIP package

### Applications

- Oil / Gas downhole tool
- High temperature industrial process control
- Extended temperature Military/Aerospace

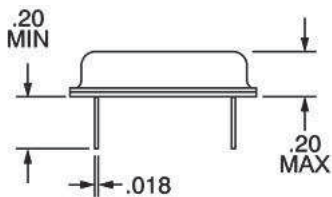
### Block Diagram



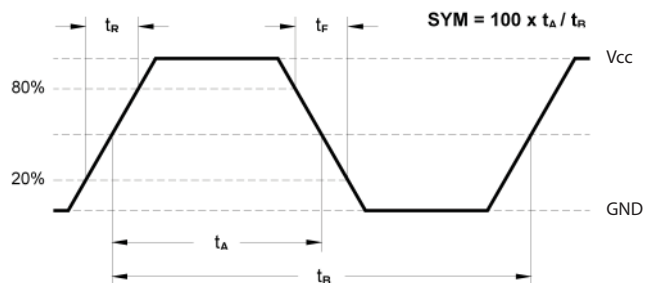
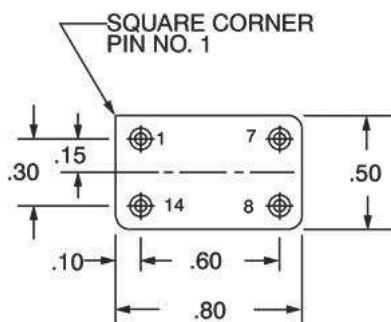
## Performance Specifications

Specification Parameters	Values
Frequency Range	10 to 30MHz
Supply (Vdd)	+5.0Vdc ±5% (D) +3.3Vdc ±5% (E)
Current	12mA typical @ 25MHz
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)
Jitter (12kHz - 20MHz)	<0.2ps
Phase Noise (@25MHz, HCMOS, 5V)	10Hz -80 dBc/Hz 100Hz -110 dBc/Hz 1kHz -135 dBc/Hz 10kHz -150 dBc/Hz 100kHz -160 dBc/Hz 1MHz -160 dBc/Hz
VCXO Control Voltage	0V to Vdd
Absolute Pull Range (APR)	Over operating temperature range, aging and power supply deviation. ±25ppm minimum (D) ±50ppm minimum (G)
Transfer Function	Positive
Linearity	±20%
Modulation Rate	dc - 1kHz
Package Size	0.5" x 0.8" x 0.2" 4 pin single DIP resistance welded
Shock	100g, 6ms
Vibration	20g, 10 to 2000Hz

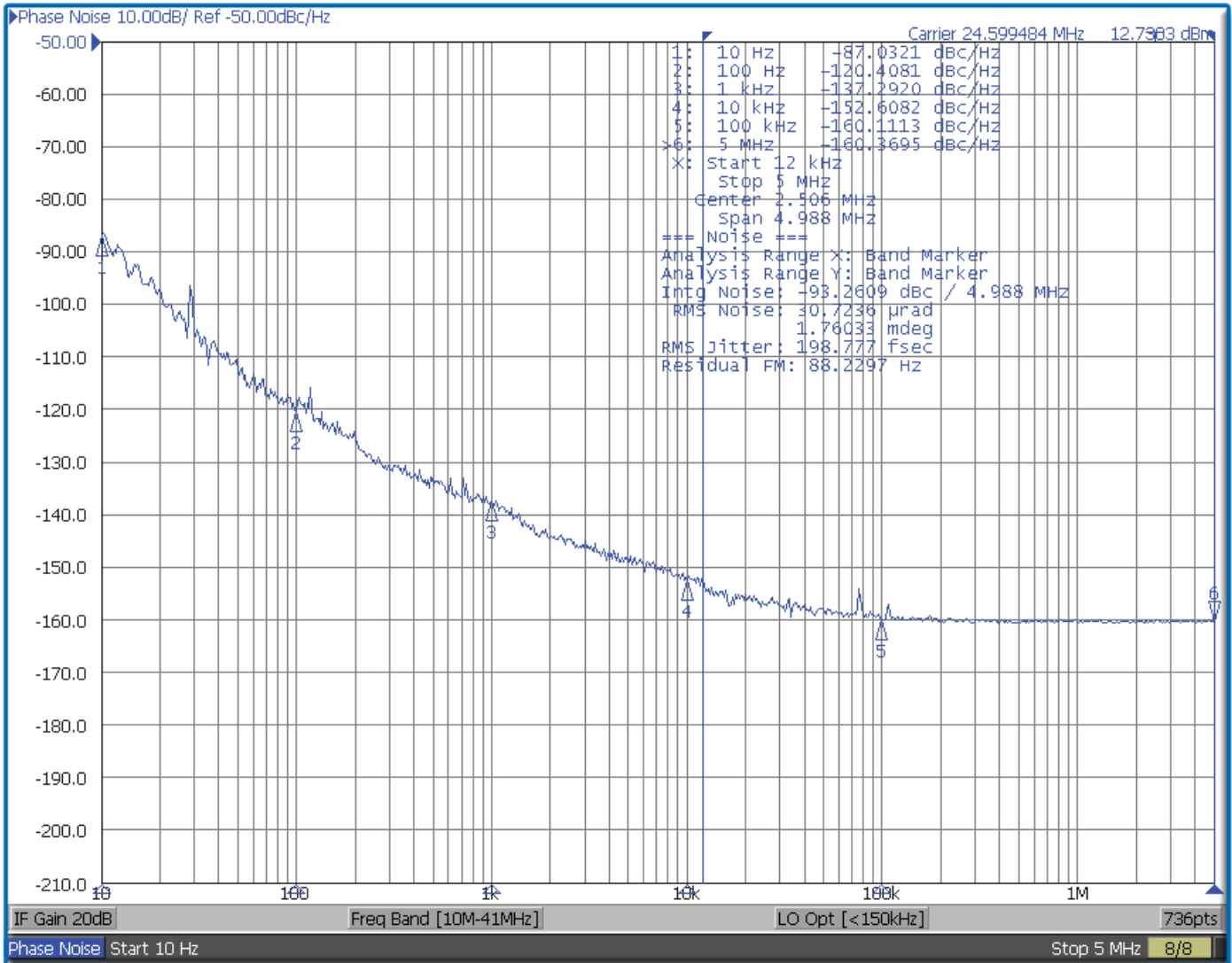
## Physical Specifications



Pin	Function
1	VCXO Control Voltage
7	Case & Electrical Ground
8	VCXO RF Output
14	V <sub>CC</sub> Power Supply Voltage



# Phase Noise Performance



## 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	100g, 6ms	MIL-STD-202 Method 213 Condition C & I
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

## Ordering Information

**VX - 400 0 - D A Y - F X X X - 10M0000000**

**Product Family**

High temp products

**Package Type**

400: 4 pin DIP

**Factory Use**

**Supply Voltage**

D: 5.0V ±5%

E: 3.3V ±5%

**Output**

A: HCMOS/ACMOS

**Frequency**

**Factory Use**

**Factory Use**

**Factory Use**

**APR (VX)**

F: ±25ppm

K: ±50ppm

**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

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

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