

Helping Customers Innovate, Improve & Grow



Description

The VX-503 voltage controlled crystal oscillator expands VI's advanced VCXO performance capabilities while adhering to a package footprint compatible with the industry-common J-lead package. The VX-503 VCXO is a quartz stabilized square wave generator with either a CMOS output for driving CMOS/TTL loads or a PECL output. The device is packaged in a 6 pin J-lead ceramic package and is hermetically sealed with a grounded conductive lid.

Features

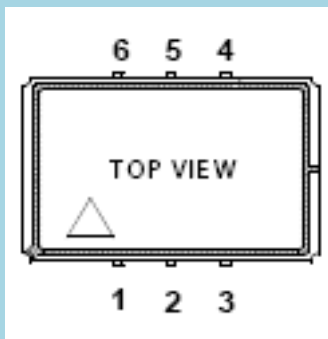
- Small 14mm x 9mm
- Low phase noise
- Frequency Range: 1 MHz to 800 MHz
- Previous Model: J-Type

Applications

- Clock Smoothing
- Frequency Translation
- SONET, SDH, ATM, DSLAM, ADM

Performance Specifications

| Parameter | Min | Typ | Max | Units | Condition |
|---|--------------------|---|-----|-------|-----------|
| Pin Out Information for the CMOS output Option | | | | | |
| Pin | Symbol | Function | | | |
| Pin 1 | VC | VCXO Control Voltage | | | |
| Pin 2 | Tri-State1 | TTL logic low disables output. TTL logic high, or no connect, enables output. | | | |
| Pin 3 | GND | Case and Electrical Ground | | | |
| Pin 4 | Output | VCXO Output | | | |
| Pin 5 | CMOS/TTL select1,2 | TTL logic low optimizes symmetry for CMOS. TTL logic high, or NC, optimizes symmetry for TTL | | | |
| Pin 6 | VCC | Power Supply Voltage (5.0 V or 3.3 V \pm 10%) | | | |



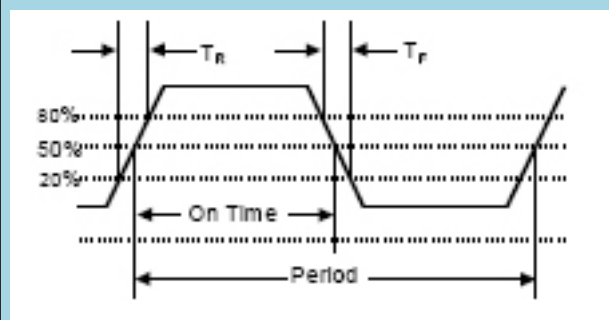
TOP VIEW

1. Standard option. Tri-State can be connected to pin 5 and CMOS/TTL select would be on pin 2.
2. Output is HCMOS. For frequencies >12MHz, this option optimizes symmetry for either CMOS or TTL thresholds. Ground this pin for frequencies < 12MHz.

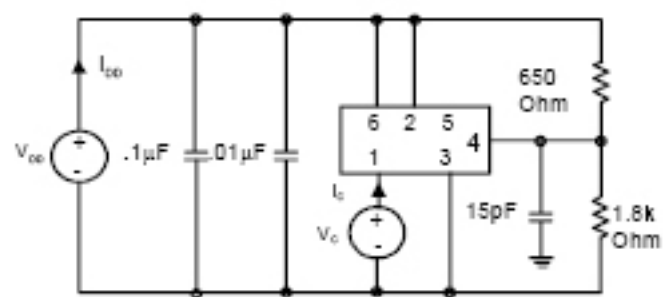
Performance Specifications

| Parameter | Min | Typ | Max | Units | Condition |
|---|--------------------------------|------------|------------|------------|---------------|
| Electrical Performance @ 25°C for the CMOS output option | | | | | |
| Supply voltage | 4.5 3.0 | 5.0 3.3 | 5.5 3.6 | VDC VDC | |
| Current consumption | 10mA + 0.25mA per MHz, typical | | | | |
| Center Frequency | 1.024 | | 77.760 | MHZ | |
| Absolute Pull Range over the operating temperature range, aging and power supply Vc= 0.5 to 4.5 or 0.3 to 3.0 V | -100 | | +100 | ppm | -40 ...+85 °C |
| | -80 | | +80 | ppm | -40 ...+85 °C |
| | -50 | | +50 | ppm | -40 ...+85 °C |
| | -100 | | +100 | ppm | 0 ... +70 °C |
| | -80 | | +80 | ppm | 0 ... +70 °C |
| | -50 | | +50 | ppm | 0 ... +70 °C |
| Gain Transfer | Positive | | | | |
| Output Level High | 0.8 | | | V | |
| Output Level Low | | | 0.1 | V | |
| Output Rise/Fall Time | | | 5 | ns | |
| Duty Cycle | 45 | | 55 | % | |
| | 40 | | 60 | % | |
| Input Leakage | | | ±1 | uA | |
| Control Voltage Modulation BW | | 10 | | KHz | |
| RMS Jitter, 77.760MHz | | 3 | | ps | |
| RMS Jitter, 77.760MHz, 12kHz to 20MHZ | | <0.5 | | ps | |
| Maximum Control Voltage | 0 | | Vdd | | |
| Maximum Supply Voltage | | | 7 | V | |
| Storage Temperature | -55 | | +125 | °C | |
| Soldering Temp./Time | | | 240/10 | °C/s | |

1. Power supply bypass is required and a 0.1uF in parallel with a 0.01uF high frequency capacitor is recommended.
2. Figure 1 defines these parameters. Figure 2 illustrates the load used to test devices.
3. Duty cycle is defined as on-time versus period at 1.4 V for TTL, and 2.5 V for CMOS (5volt supply) and at 1.65 V for CMOS (3.3 volt operation)



Output Waveform



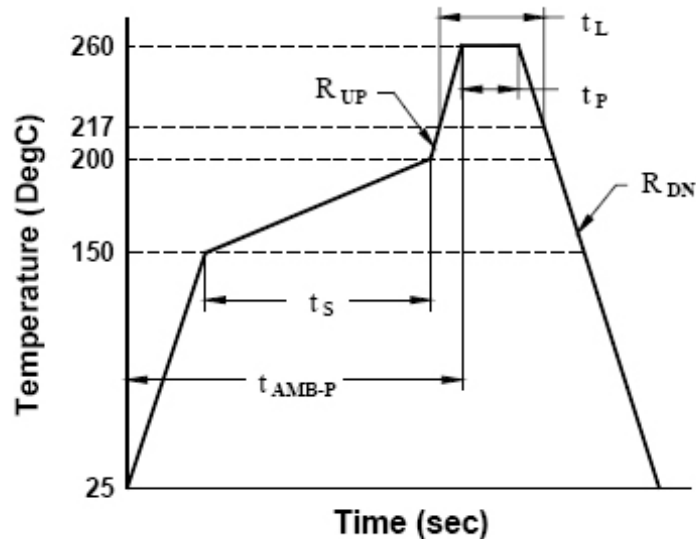
Output Test Conditions (25±5°C) for 5 volt devices, 15pF cap only for 3.3V.

Environmental Compliance

| | |
|------------------------|--------------------------|
| Mechanical Shock | MIL-STD-883, Method 2002 |
| Mechanical Vibration | MIL-STD-883, Method 2007 |
| Solderability | MIL-STD-883, Method 2003 |
| Gross and Fine Leak | MIL-STD-883, Method 1014 |
| Resistance to Solvents | MIL-STD-883, Method 2015 |

Performance Specifications

| Parameter | Min | Typ | Max | Units | Condition |
|--|-----|-----|-----|-------|-------------------------|
| Reflow Profile (IPC/JEDEC J-STD-020C) | | | | | |
| PreHeat Time | | | | | 60 sec Min, 180 sec Max |
| Ramp Up | | | | | 3 °C/sec Max |
| Time Above 217 °C | | | | | 60 sec Min, 150 sec Max |
| Time To Peak Temperature | | | | | 480 sec Max |
| Time At 260 °C | | | | | 20 sec Min, 40 sec Max |
| Ramp Down | | | | | 6 °C/sec Max |



PECL Output Options

| Pin | Symbol | Function |
|-------|-------------|--|
| Pin 1 | VC | VCXO Control Voltage |
| Pin 2 | N/C or E/D2 | No Connect or Output Disable |
| Pin 3 | GND | Case and Electrical Ground |
| Pin 4 | Output | VCXO Output |
| Pin 5 | COutput | VCXO Complementary Output |
| Pin 6 | VCC | Power Supply Voltage (5.0V or 3.3V ±10%) |

TOP VIEW

- By setting OD high, the outputs are disabled and OUT is held low while Complementary OUT is held high. Output is enabled if E/D < VCC-1.6V.
- See ordering information for enable/disable option.

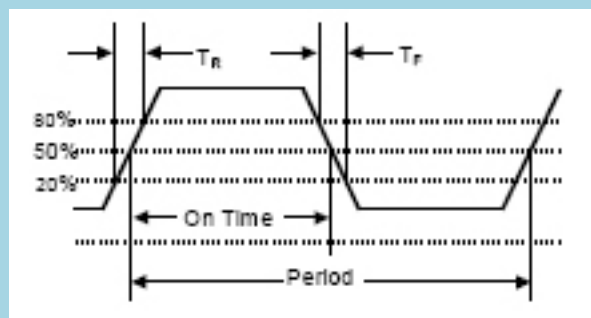
Electrical Performance @ 25°C for the PECL output option

| | | | | | |
|---|---------------------|------------|------------|------------|---------------|
| Supply voltage | 4.5 3.0 | 5.0 3.3 | 5.5 3.6 | VDC VDC | |
| Current consumption | frequency dependent | | | | |
| Center Frequency | 15 | | 170 | MHZ | |
| Absolute Pull Range over the operating temperature range, aging and power supply Vc= 0.5 to 4.5 or 0.3 to 3.0 V | -50 | | +50 | ppm | -40 ...+85 °C |
| | -32 | | +32 | ppm | -40 ...+85 °C |
| | -50 | | +50 | ppm | 0 ... +70 °C |
| | -32 | | +32 | ppm | 0 ... +70 °C |

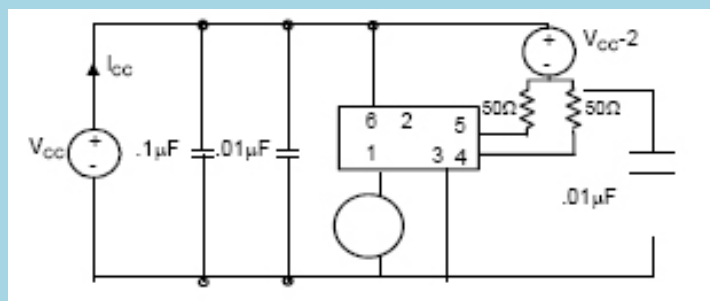
Performance Specifications

| Parameter | Min | Typ | Max | Units | Condition |
|--|----------|-----|-----------------|-------|-----------|
| Gain Transfer | Positive | | | | |
| Output Level High | -1.025 | | -0.880 | V | |
| Output Level Low | -1.810 | | -1.620 | V | |
| Output Logic Levels for -40 to 85 °C Operation | | | | | |
| Output Level High | -1.085 | | -0.880 | V | |
| Output Level Low | -1.830 | | -1.555 | V | |
| Output Rise/Fall Time | | | 1 | ns | |
| Duty Cycle | 45 | | 55 | % | |
| Input Leakage | | | ±1 | mA | |
| Control Voltage Modulation BW | | 10 | | KHz | |
| RMS Jitter, 77.760MHz, 12kHz to 20MHZ | | | <1 | ps | |
| Maximum Control Voltage | 0 | | V _{dd} | V | |
| Maximum Supply Voltage | | | 7 | V | |
| Storage Temperature | -55 | | +125 | °C | |
| Soldering Temp./Time | | | 240/10 | °C/s | |

1. Power supply bypass is required and a 0.1uF in parallel with a 0.01uF high frequency capacitor is recommended.
2. Transition times are measured from 20% to 80% of a full 10K ECL level swing.

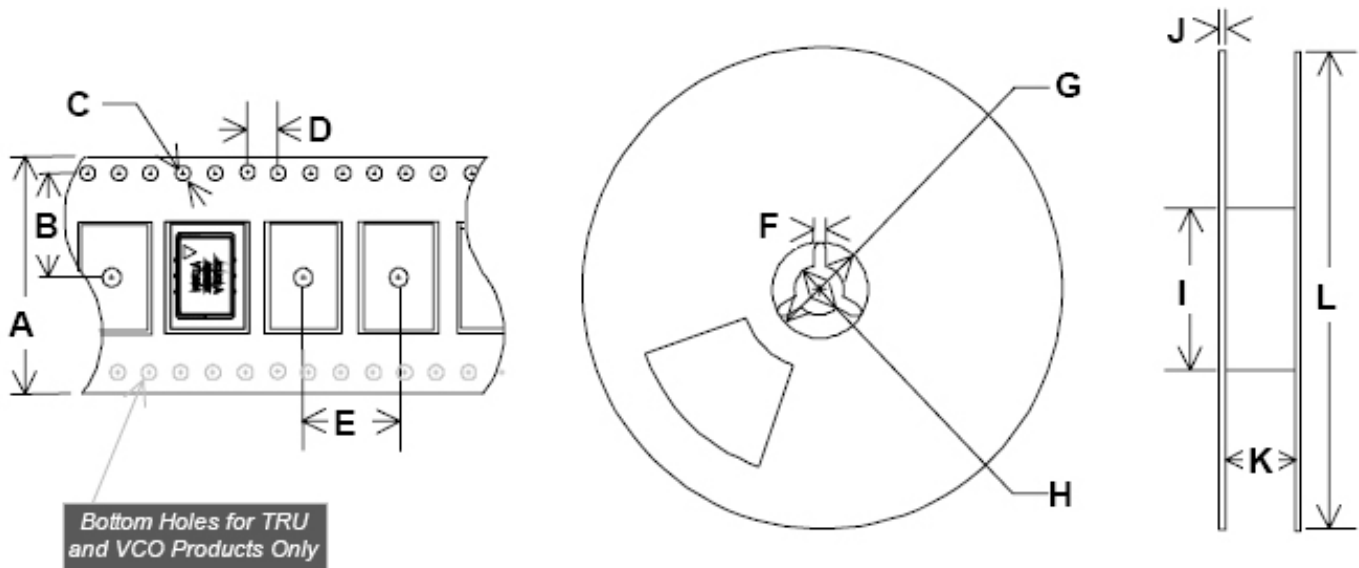
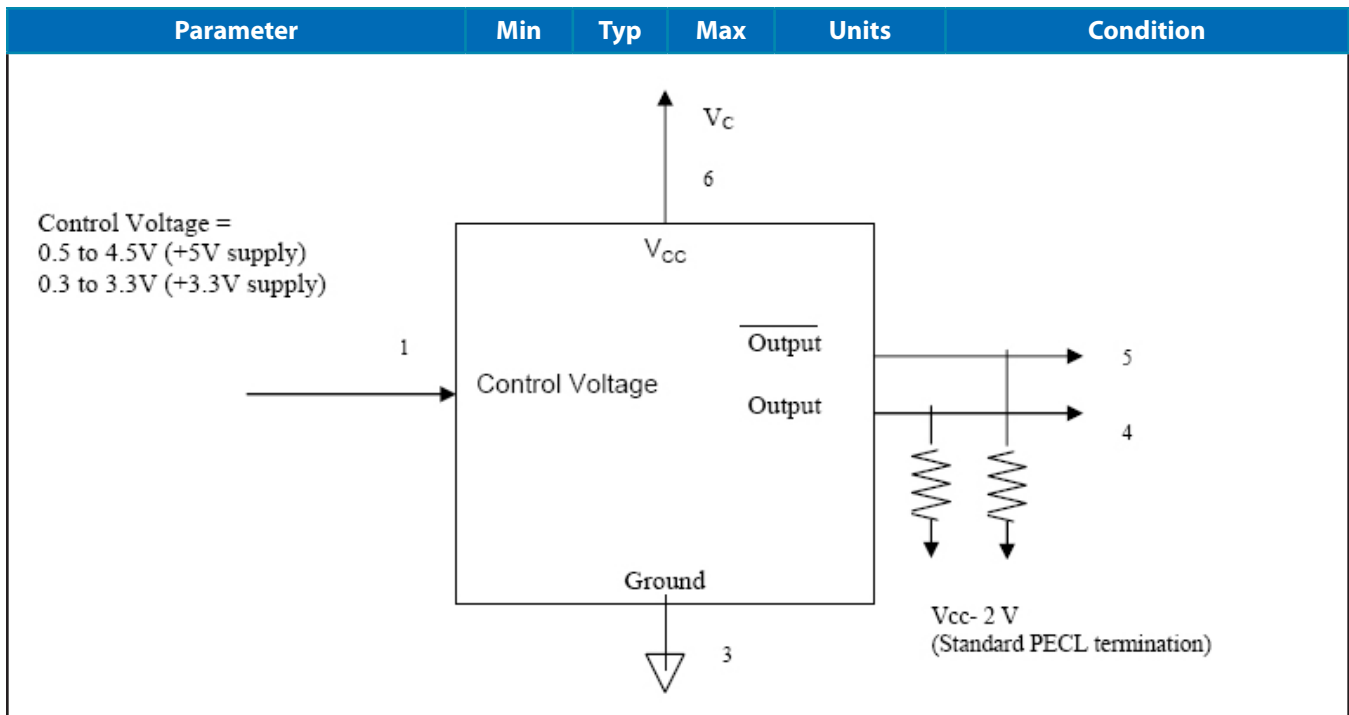


Output Waveform



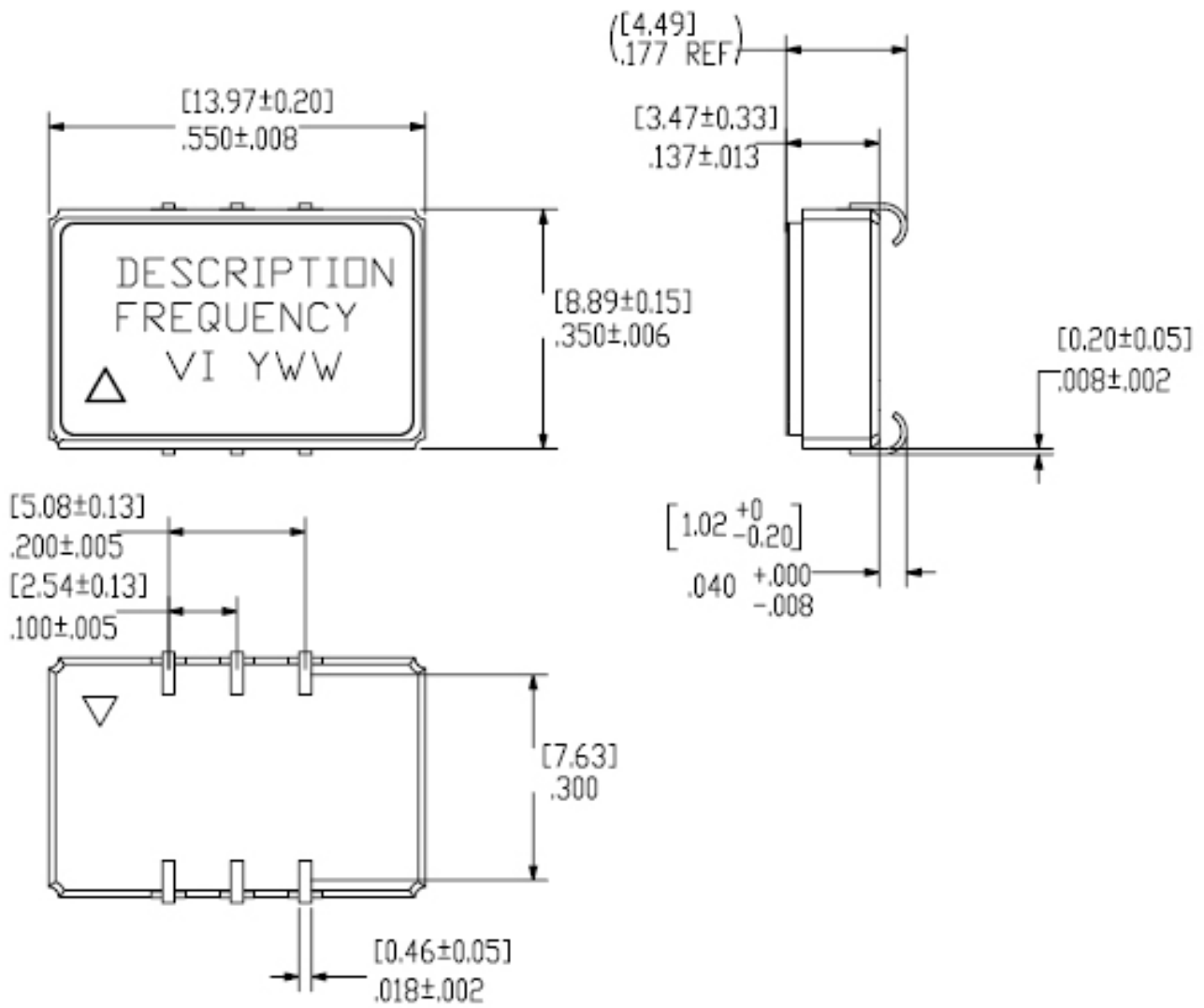
Output Test Conditions (25±5°C)

Performance Specifications

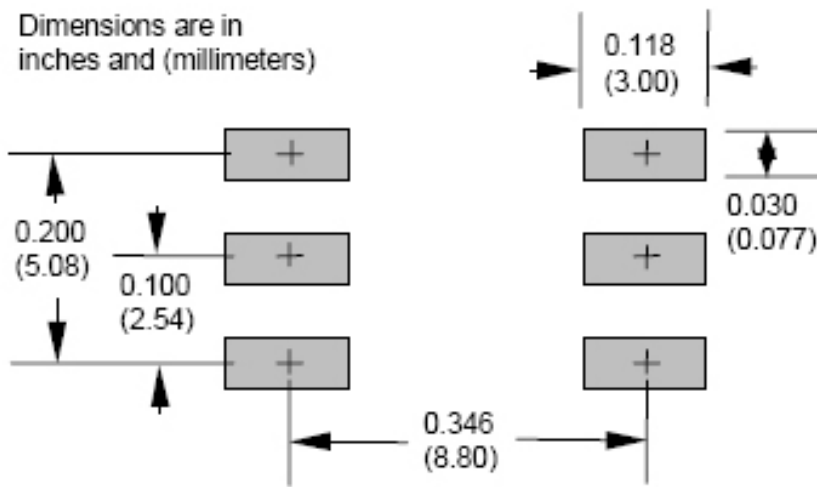


| Tape and Reel Dimensions (mm) | | | | | | | | | | | | | |
|-------------------------------|----|------|-----|---|----|-----------------|----|----|-----|---|----|-----|------------|
| Tape Dimensions | | | | | | Reel Dimensions | | | | | | | |
| Product | A | B | C | D | E | F | G | H | I | J | K | L | # Per Reel |
| J-Type | 24 | 11.5 | 1.5 | 4 | 12 | 1.78 | 21 | 13 | 100 | 5 | 25 | 330 | 200 |

Outline Drawing / Enclosure

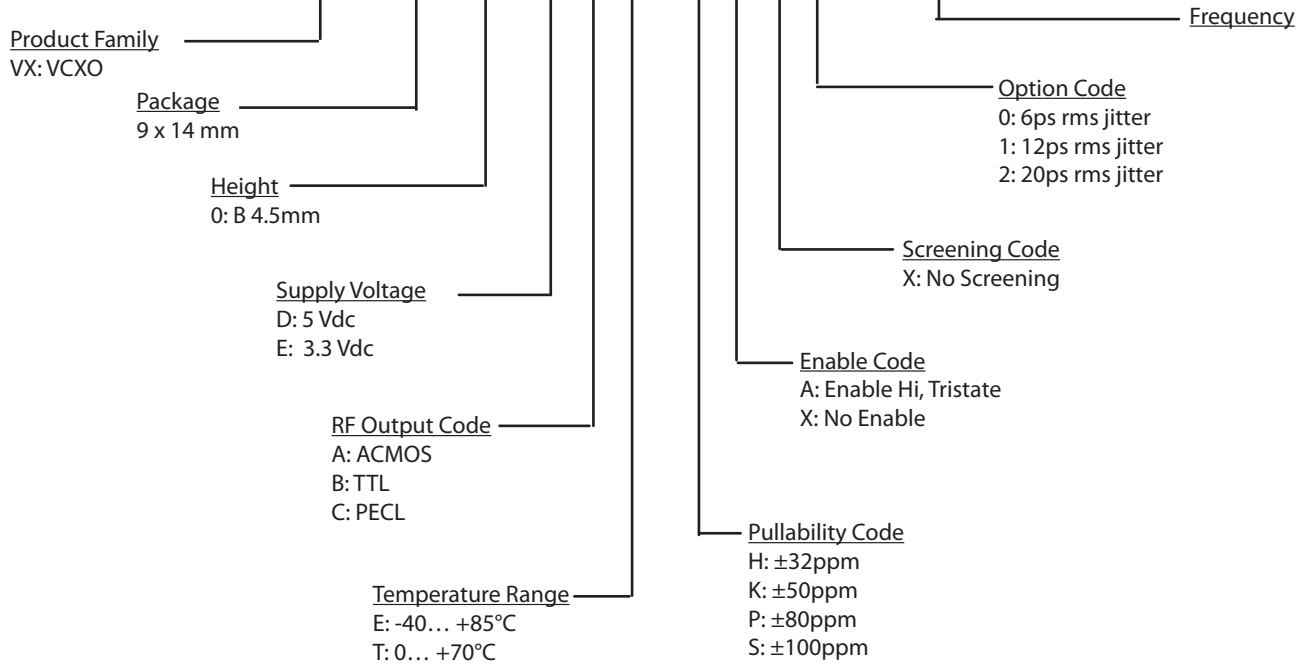


Dimensions are in inches and (millimeters)



Ordering Information

VX - 503 0 - D A T - K X X 2 - 10M0000000



Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

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