

Helping Customers Innovate, Improve &amp; 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

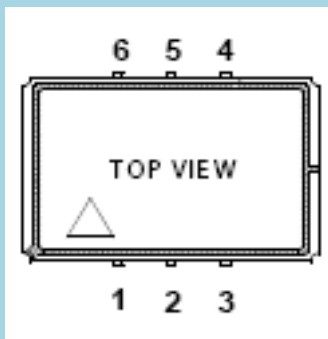
- Small 14mm x 9mm
- Low phase noise
- Frequency Range: 1 MHz to 800 MHz
- Previous Model: J-Type

### Applications

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

### Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
<b>Pin Out Information for the CMOS output Option</b>					
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%)			



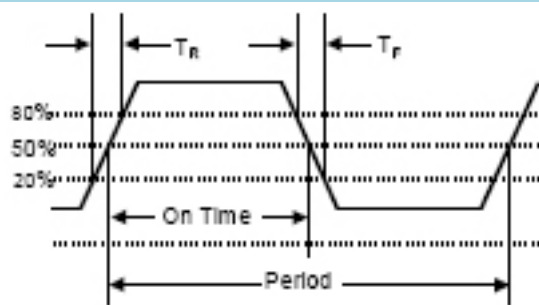
**TOP VIEW**

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.

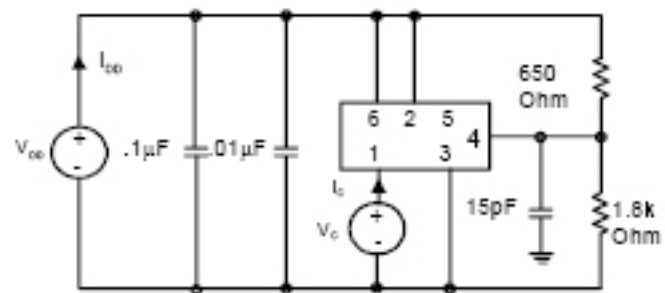
## Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
<b>Electrical Performance @ 25°C for the CMOS output option</b>					
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



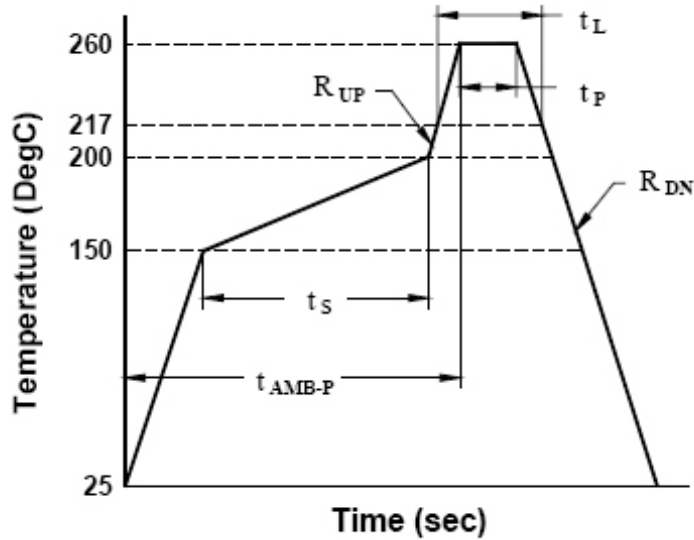
Output Test Conditions (25±5°C) for 5 volt devices, 15pF cap only for 3.3V.

### 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
<b>Reflow Profile (IPC/JEDEC J-STD-020C)</b>					
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.

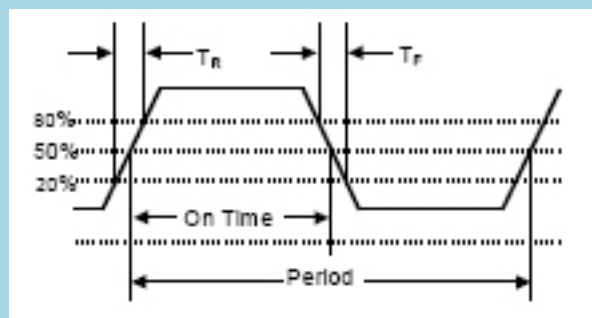
### Electrical Performance @ 25°C for the PECL output option

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

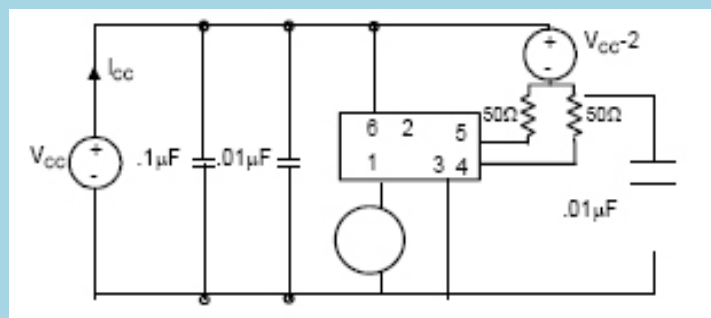
## Performance Specifications

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 <sub>dd</sub>	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.

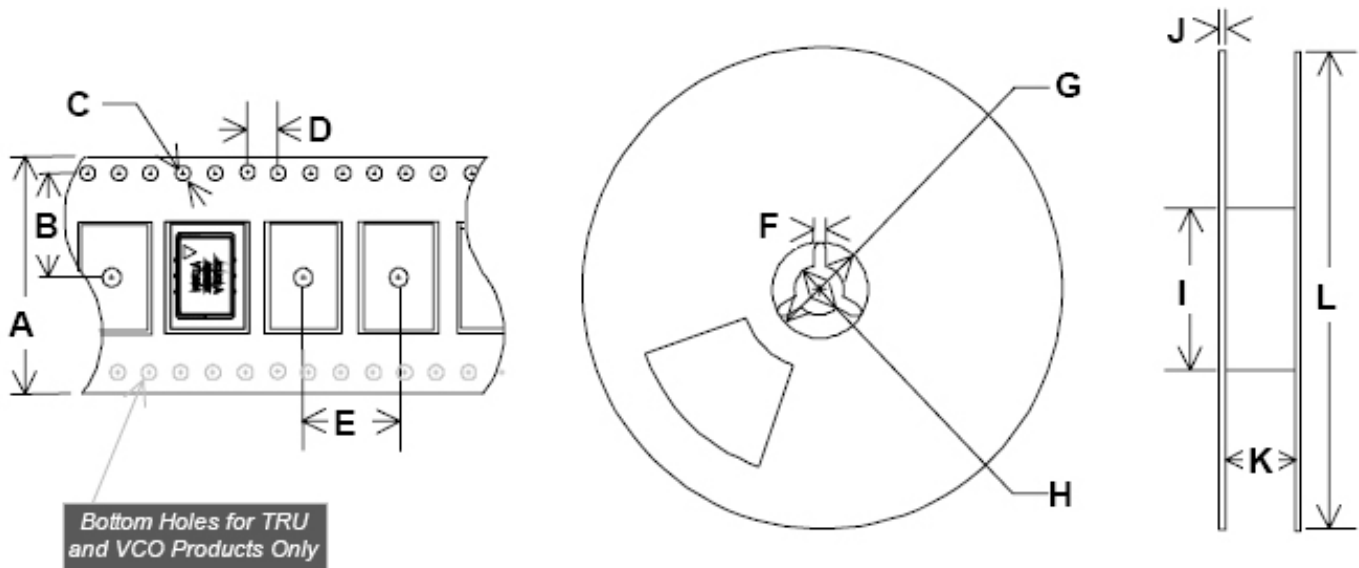
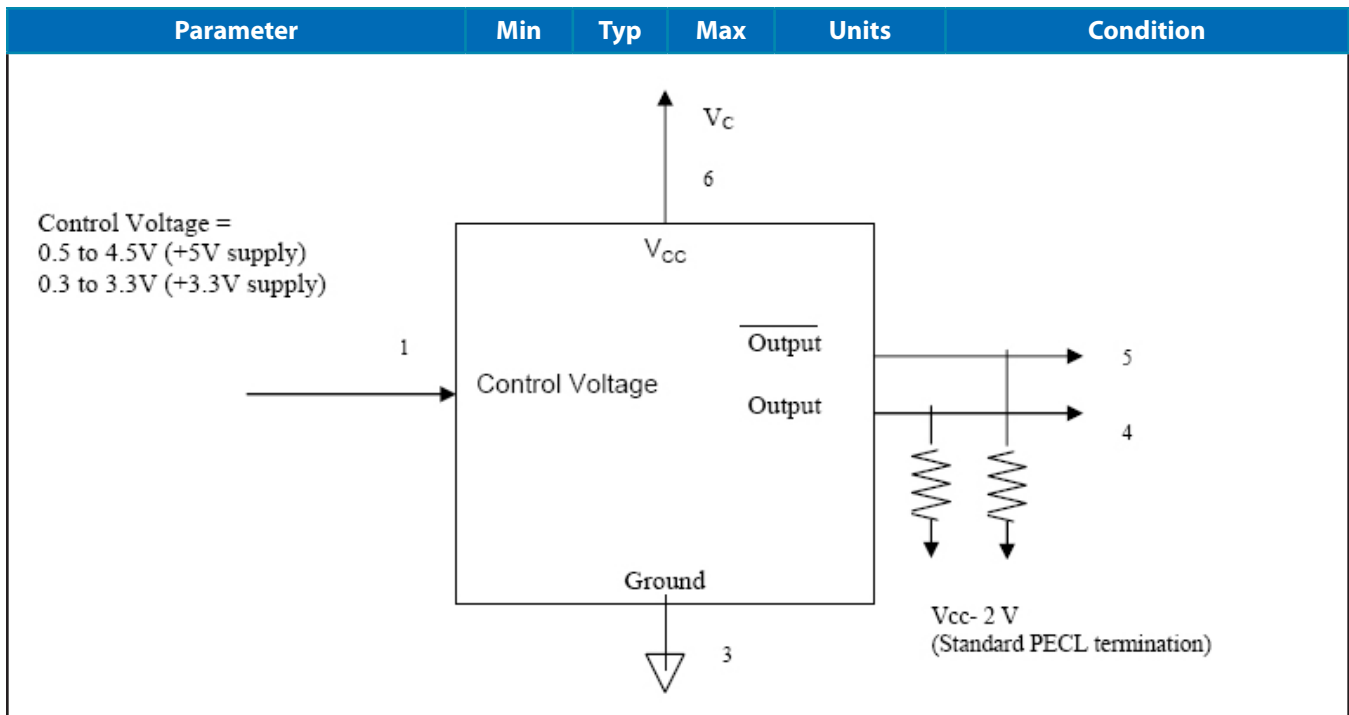


Output Waveform



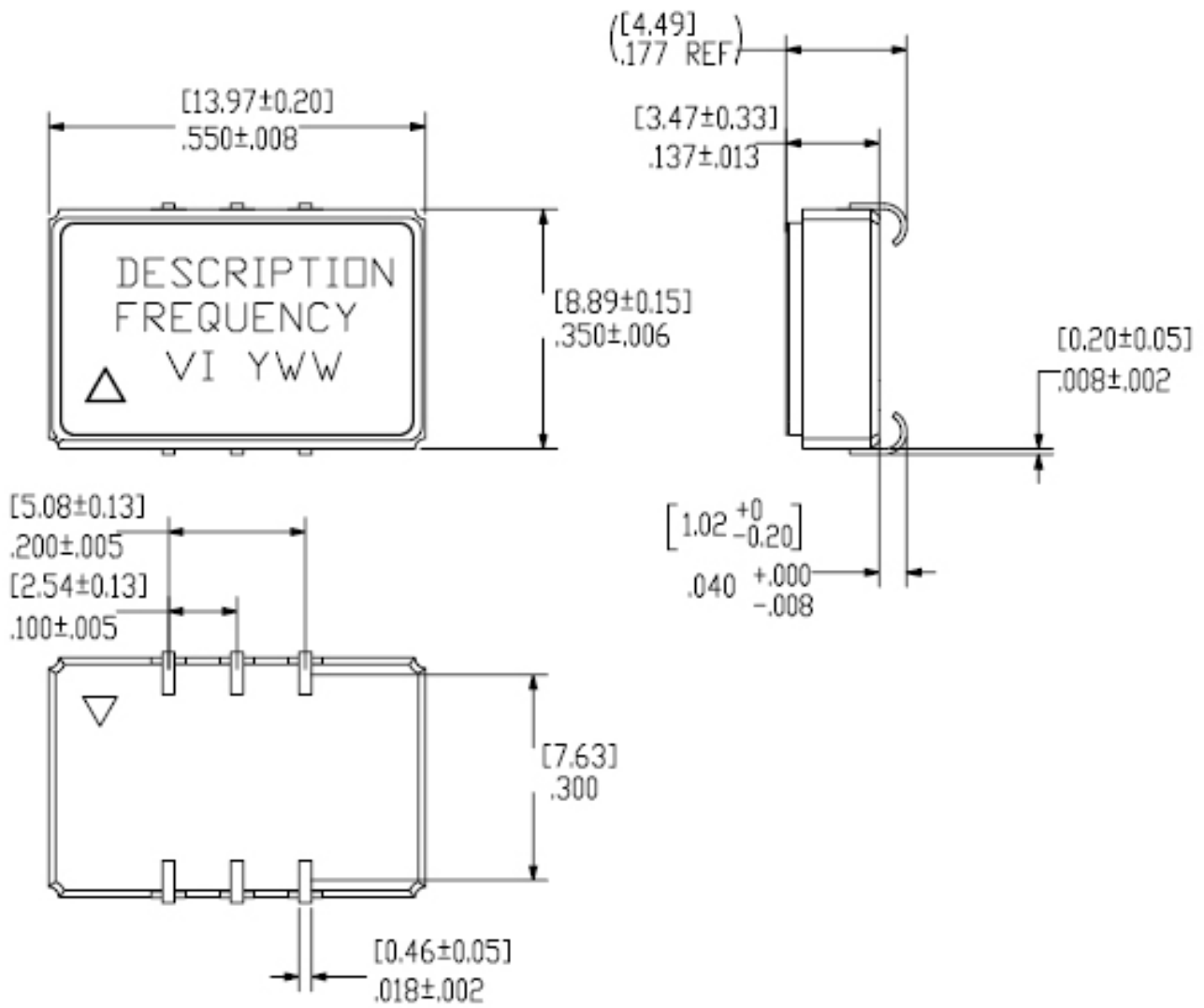
Output Test Conditions (25±5°C)

# Performance Specifications

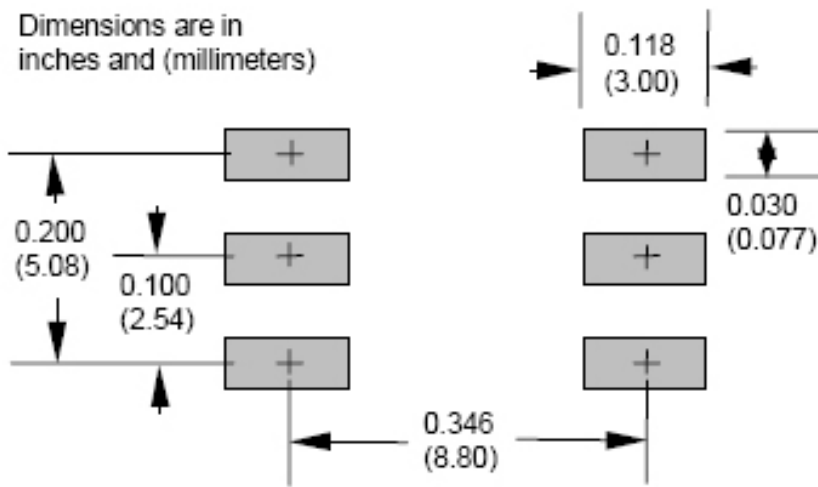


Tape and Reel Dimensions (mm)													
Tape Dimensions						Reel Dimensions							
Product	A	B	C	D	E	F	G	H	I	J	K	L	# Per Reel
J-Type	24	11.5	1.5	4	12	1.78	21	13	100	5	25	330	200

# Outline Drawing / Enclosure

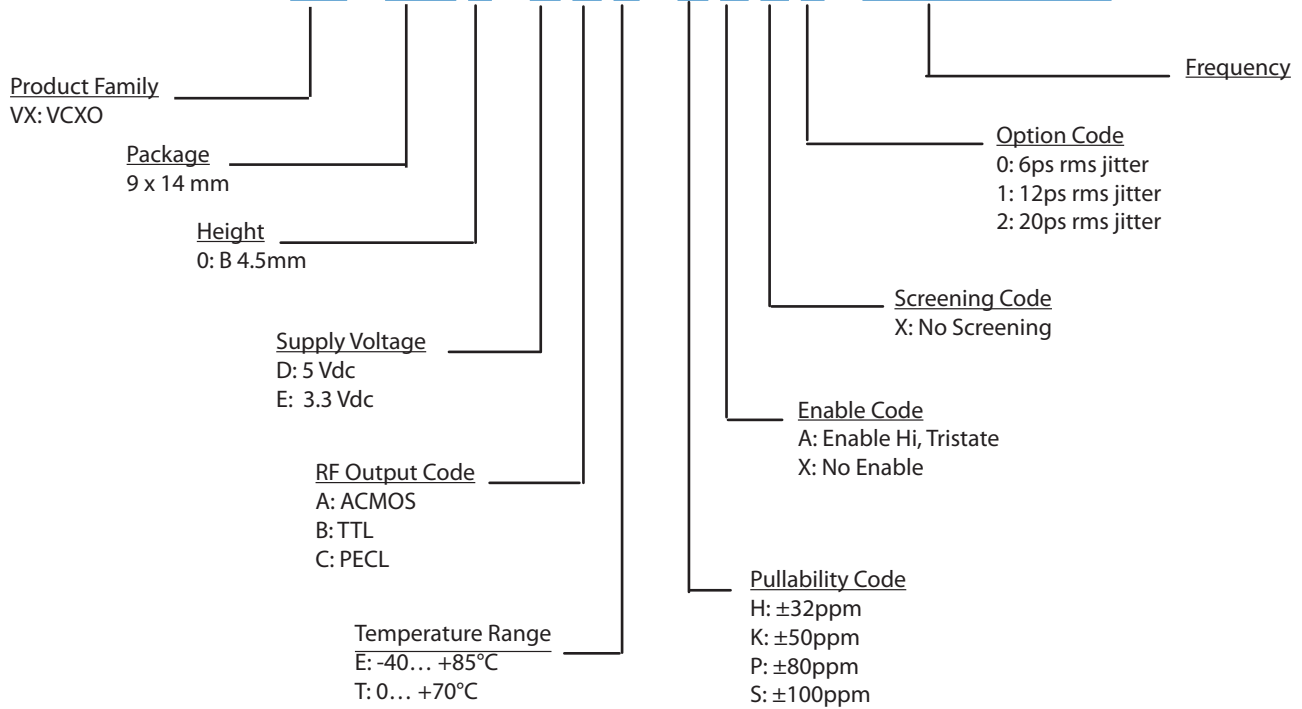


Dimensions are in inches and (millimeters)



## 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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