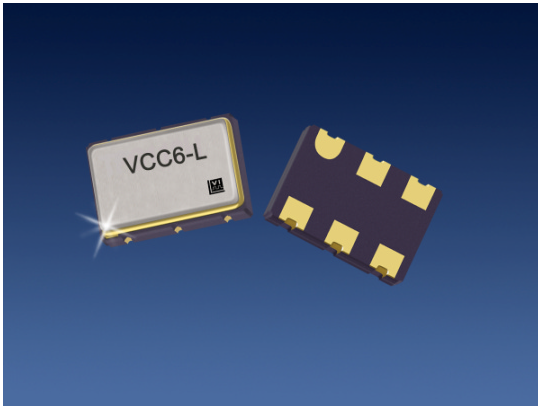
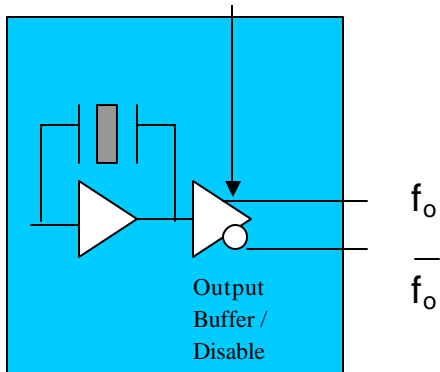


# VCC6-L


## 3.3 volt LVDS Oscillator, >270MHz



The VCC6 Crystal Oscillator



### Features

- 3.3 V LVDS
- Output frequencies from 270-800 MHz
- Enable/Disable output for test and board debug
- -10/70 or -40/85 °C operating temperature
- Hermetically sealed ceramic SMD package
- Product is compliant to RoHS directive  and fully compatible with lead free assembly

### Applications

- SONET/SDH/DWDM
- Ethernet, Gigabit Ethernet
- Storage Area Network
- Digital Video
- Broadband Access

### Description

Vectron's VCC6 Crystal Oscillator (XO) is quartz stabilized square wave generator with a LVDS output, operating off a 3.3 volt supply.

## VCC6-L Output Frequencies > 270MHz

### Performance Characteristics

Table 1. Electrical Performance					
Parameter	Symbol	Min	Typical	Maximum	Units
Frequency	$f_o$	270		800	MHz
Supply Voltage <sup>1</sup>	$V_{DD}$	3.15	3.3	3.45	
Supply Current, Output Enabled	$I_{DD}$			80	mA
Supply Current, Output Disabled	$I_{DD}$			10	uA
Output Logic Levels					
Output Logic High <sup>2</sup>	$V_{OH}$		1.40	1.6	V
Output Logic Low <sup>2</sup>	$V_{OL}$	0.9	1.10		V
Differential Output	$V_{OD}$	247	330	454	mV
Differential Output Error				50	mV
Differential Output Skew				200	ps
Load (differential)			100		ohms
Offset Voltage	$V_{OS}$	1.125	1.25	1.375	V
Offset Error	$V_{OS}$			25	mV
Output Leakage Current				±10	uA
Transition Times					
Rise Time <sup>2</sup>	$t_R$			600	ps
Fall Time <sup>2</sup>	$t_F$			600	ps
Symmetry or Duty Cycle <sup>3</sup>	SYM	45	50	55	%
Operating temperature (ordering option)				-10/70 or -40/85	°C
Stability (ordering option) <sup>4</sup>				±25, ±50 or ±100	ppm
RMS Jitter, 12kHz to 20 MHz			2		ps
Period RMS Jitter			4		ps
Period P/P Jitter			30		ps
Output Enabled <sup>5</sup>		0.7*VDD			V
Output Disabled <sup>5</sup>				0.3*VDD	V
Output Enable/Disable time				400	nS
Package Size				5.0 x 7.0 x 1.5	mm

1. A 0.01uF and a 0.1uF capacitor should be located as close to the supply as possible (to ground) is recommended.
2. Figure 1 defines these parameters.
3. Symmetry is measured defined as On Time/Period.
4. Includes calibration tolerance, operating temperature, supply voltage variations, aging (40 degreesC/10 years) and shock and vibration (not under operation).
5. Output will be enabled if enable/disable is left open.

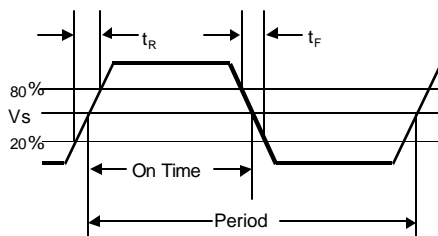
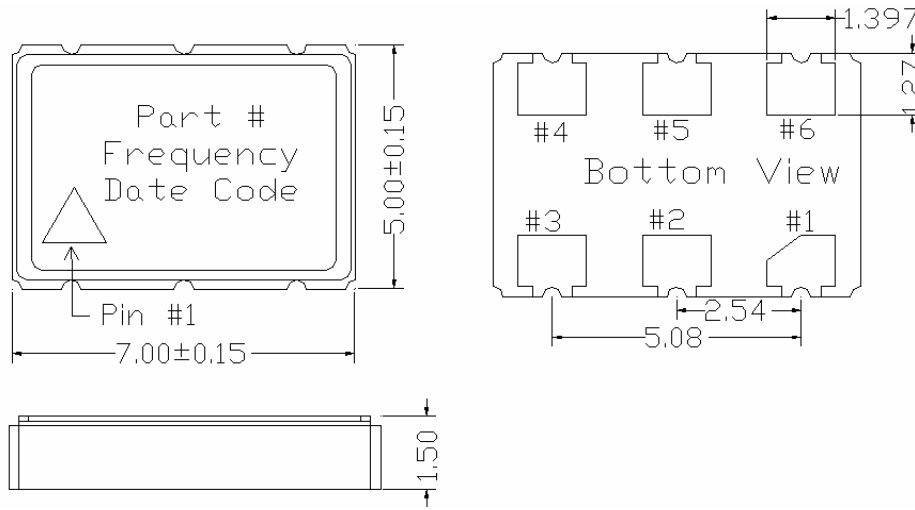


Figure 1. Output Waveform

## VCC6-L Output Frequencies > 270MHz

### Outline Diagram, Pad Layout and Pin Out



Contact Pad Plating: gold over nickel

Pin #	Symbol	Function
1	E/D	Tristate Function
2	NC	This pin has no internal connection and is floating.
3	GND	Ground
4	$f_o$	Output Frequency
5	$Cf_o$	Complementary Output Frequency
6	$V_{DD}$	Supply Voltage

Pin #	Symbol	Function
1	NC	This pin has no internal connection and is floating.
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## VCC6-L Output Frequencies > 270MHz

### Tape and Reel

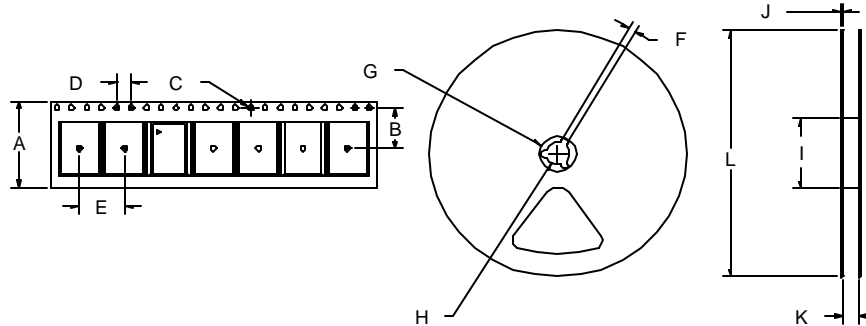


Table 4. Tape and Reel Dimensions (mm)

Tape Dimensions						Reel Dimensions							# Per Reel
Product	A	B	C	D	E	F	G	H	I	J	K	L	
VCC6	16	7.5	1.5	4	8	2	21	13	60	2	17	180	250

### Enable/Disable Functional Description

Under normal operation the Enable/Disable is left open, or set to a logic high state, and the VCC6 is an oscillation mode with active outputs. When the E/D is set to a logic low, the oscillator stops and the both the output and complementary output are in a high impedance state. This helps facilitate board testing and troubleshooting.

### Absolute Ratings

Stresses in excess of the absolute maximum ratings can permanently damage the device. Functional operation is not implied at these or any other conditions in excess of conditions represented in the operational sections of this data sheet. Exposure to absolute maximum ratings for extended periods may adversely affect device reliability.

Table 5. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power Supply	$V_{DD}$	-0.5 to +4.6	Vdc
Enable/Disable	$V_{IN}$	-0.5 to $V_{DD}+0.5$	Vdc
Storage Temperature	$T_{storage}$	-55/125	°C

## VCC6-L Output Frequencies > 270MHz

### Reliability

The VCC6 qualification tests include the following:

Table 6. Environmental Compliance	
Parameter	Conditions
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 2016
Moisture Sensitivity Level	MSL1

### Handling Precautions

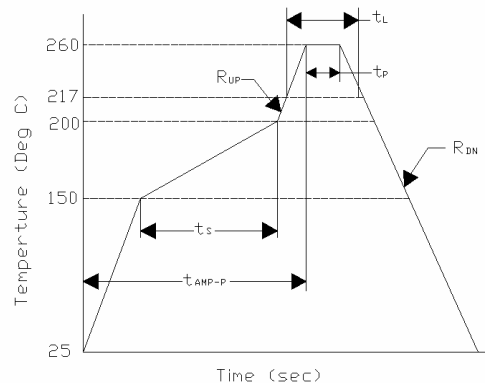
Although ESD protection circuitry has been designed into the the VCC6, proper precautions should be taken when handling and mounting. VI employs a Human Body Model and a Charged-Device Model (CDM) for ESD susceptibility testing and design protection evaluation. ESD thresholds are dependent on the circuit parameters used to define the model. Although no industry wide standard has been adopted for the CDM, a standard HBM of resistance = 1.5kohms and capacitance = 100pF is widely used and therefore can be used for comparison purposes.

Table 7. ESD Ratings		
Model	Minimum	Conditions
Human Body Model	1000	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

### Suggested IR profile

Table 8 shows max temperatures and lower temperatures can also be used e.g. peak temperature of 220C. Termination finish is gold over nickel. The VCC6 is hermetically sealed so an aqueous wash is not an issue.

Table 8. Reflow Profile		
Parameter	Symbol	Value
PreHeat Time	$t_s$	60 sec Min, 180 sec Max
Ramp Up	$R_{UP}$	3 °C/sec Max
Time Above 217 °C	$t_L$	60 sec Min, 150 sec Max
Time To Peak Temperature	$t_{AMB-P}$	480 sec Max
Time At 260 °C (max)	$t_P$	15 sec Max
Ramp Down	$R_{DN}$	6 °C/sec Max



## VCC6-L Output Frequencies > 270MHz

Frequencies (MHz)				
311.040	312.500	320.000	322.2656	332.000
333.000	350.000	400.000	446.000	472.000
500.000	600.000	622.080	625.000	644.5313
666.5413	669.3236	693.3265	693.4829	693.750
700.000	779.5686			

Other frequencies may be available upon request. Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.

## Ordering Information

### VCC6-LCB – 622M080

**Product Family** \_\_\_\_\_

Crystal Oscillator

**Output** \_\_\_\_\_

L: LVDS 3.3 Volts

**Enable/Disable** \_\_\_\_\_

A: E/D is on Pin 2, Pin 2 is a NC

C: E/D is on Pin 1, Pin 2 is a NC

**Frequency**

example: 622M080= 622.080 MHz

**Stability Options/Temperature**

A: ±100ppm      -10 to 70°C

B: ±50ppm        -10 to 70°C

C: ±100ppm      -40 to 85°C

D: ±50ppm        -40 to 85°C

E: ±25ppm        -10 to 70°C

F: ±25ppm        -40 to 85°C

**NOTE: Not all combinations are available.**

A ±20ppm over -10 to 70°C, +3.3V, E/D on pin 1, VCC6-109-frequency, is available.



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VCC6-L >270MHz (REVISION DATE: Janaury26, 2007)