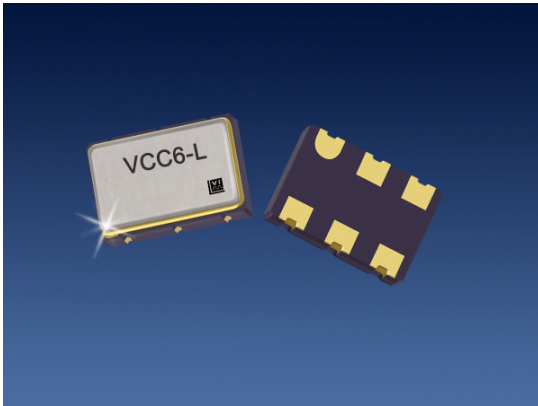
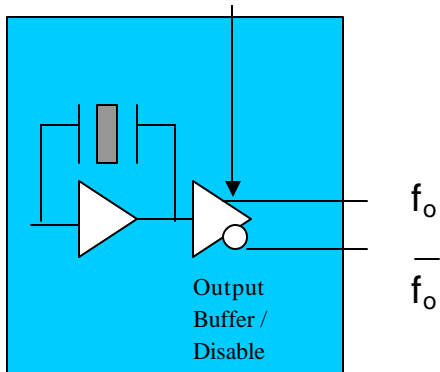


VCC6-L


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 ¹ | 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 ² | V_{OH} | | 1.40 | 1.6 | V |
| Output Logic Low ² | 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 ² | t_R | | | 600 | ps |
| Fall Time ² | t_F | | | 600 | ps |
| Symmetry or Duty Cycle ³ | SYM | 45 | 50 | 55 | % |
| Operating temperature (ordering option) | | | | -10/70 or -40/85 | °C |
| Stability (ordering option) ⁴ | | | | ±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 ⁵ | | 0.7*VDD | | | V |
| Output Disabled ⁵ | | | | 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.

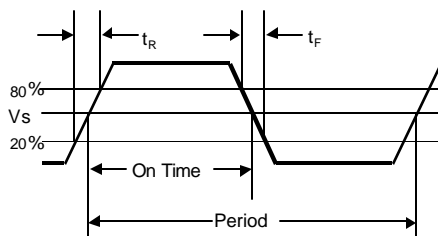
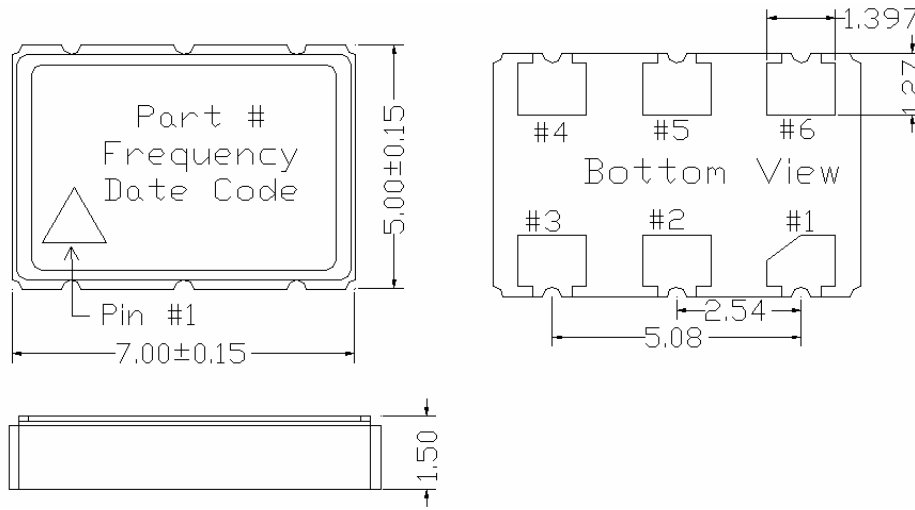


Figure 1. Output Waveform

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 |

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VCC6-L Output Frequencies > 270MHz

Tape and Reel

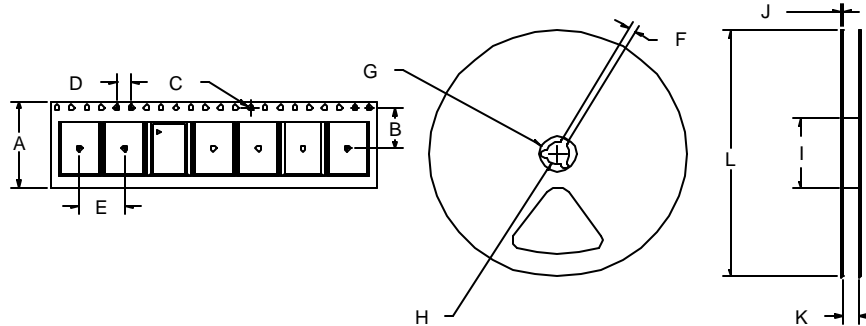


Table 4. Tape and Reel Dimensions (mm)

| 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:

| 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

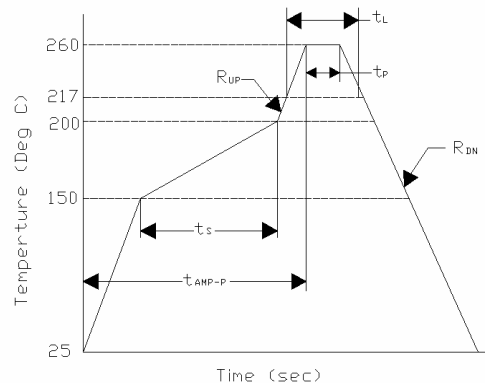
Although ESD protection circuitry has been designed into the the VCC6, proper precautions should be taken when handling and mounting. VI employs a Human Body Model and a Charged-Device Model (CDM) for ESD susceptibility testing and design protection evaluation. ESD thresholds are dependent on the circuit 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.

| 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.

| 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_{AMP-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)