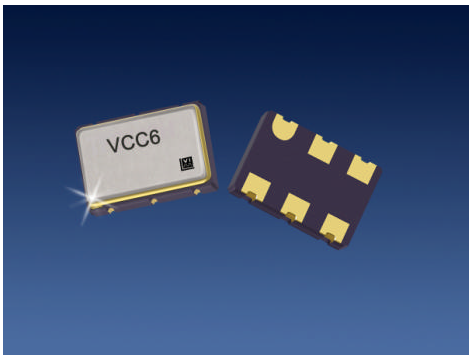
VCC6-107

+/-20 ppm LVPECL Oscillator



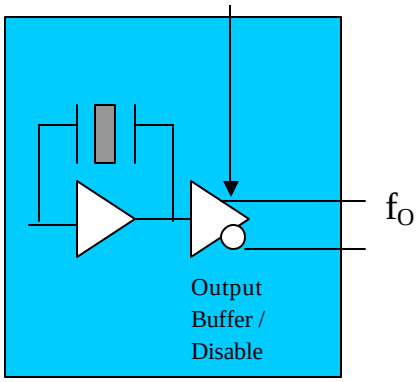
The VCC6-107 Crystal Oscillator

Features

- +/-20 ppm, including aging
- 3rd Overtone Crystal for best jitter performance
- Output frequencies to 200 MHz
- Low Jitter
- Enable/Disable output for test and board debug
- -10/70 °C operating temperature
- Hermetically sealed ceramic SMD package
- Product is compliant to RoHS directive and fully compatible with lead free assembly

Applications

- WLAN
- 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 LV-PECL output, operating off a 3.3 volt supply.

Performance Characteristics

Table 1. Electrical Performance

Parameter	Symbol	Min	Typical	Maximum	Units
Frequency	f_O	40		200	MHz
Supply Voltage [1]	V_{DD}	3.135	3.3	3.465	V
Supply Current	I_{DD}			98	mA
Output Logic Levels					
Output Logic High[2]	V_{OH}	V_{DD}-1.025		V_{DD}-0.880	V
Output Logic Low[2]	V_{OL}	V_{DD}-1.810		V_{DD}-1.620	V
Transition Times					
Rise Time[2]	t_R			600	ps
Fall Time[2]	t_F			600	ps
Output Load		50 ohms to V_{DD}-2V			
Symmetry or Duty Cycle[3]	SYM	45	50	55	%
Operating temperature		-10/70			°C
Stability [4]				+/-20	ppm
RMS Jitter, 12kHz to 20 MHz			0.3	0.7	ps
Period RMS Jitter			2.7		ps
Cycle to Cycle RMS Jitter			4.8		ps
Output Enabled[5]		0.7*VDD			V
Output Disabled[5]				0.3*VDD	V
Output Enable/Disable time				400	ns
Enable/Disable Leakage Current	$I_{E/D}$			±200	uA
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. Figure 2 illustrates the operating conditions under which these parameters are tested and specified.
3. Symmetry is defined as Vs, On Time/Period.
4. Includes calibration tolerance, operating temperature, supply voltage variations, aging (10 years @ 40 degreesC) and shock and vibration (not under operation).
5. Output will be enabled if enable/disable is left open.
6. Jitter is measured using a LeCroy8600 sampling 50,000 cycles.

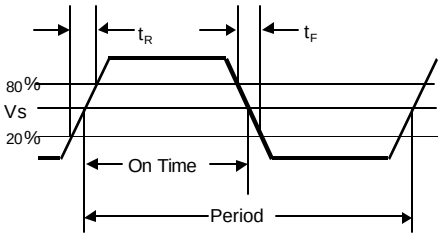


Figure 1. Output Waveform

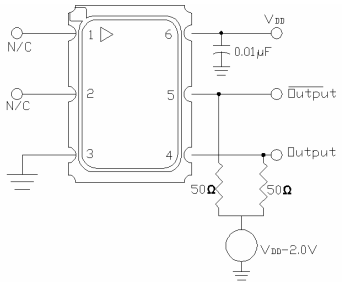


Figure 2. Typical Output Test Conditions (25±5°C)

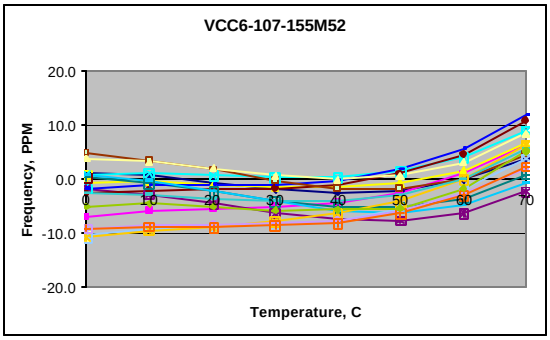


Figure 3. Temperature Stability

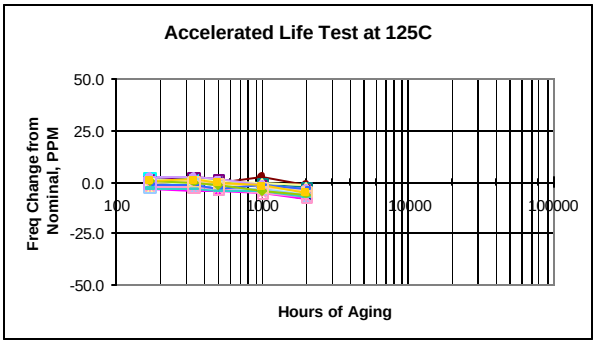
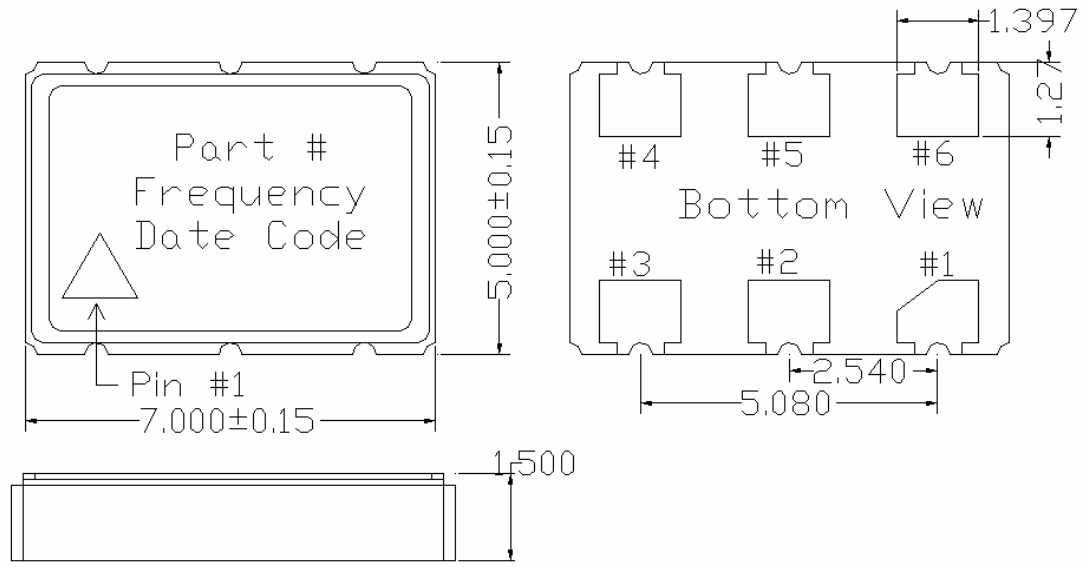


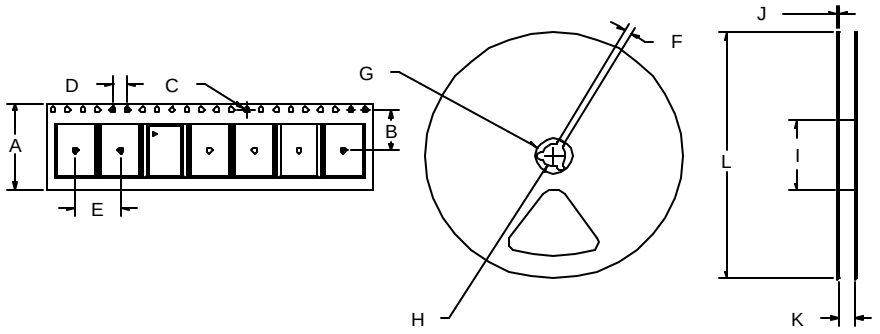
Figure 4. Aging Stability

Outline Diagram and Pin Out



Pin #	Symbol	Function
1	E/D	Enable/Disable function
2	NC	No Connection
3	GND	Ground
4	f_O	Output Frequency
5	Cf_o	Complementary Output Frequency
6	V_{DD}	Supply Voltage

Tape and Reel



Tape and Reel Dimensions (mm)													
Tape Dimensions						Reel Dimensions							# Per
Product	A	B	C	D	E	F	G	H	I	J	K	L	Reel
VCC6	16	7.5	2.0	4	8	2	21	13	55	2	17	180	250

Absolute Maximum 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 2. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power Supply	V_{DD}	-0.5 to +7.0	Vdc
Enable/Disable	V_{IN}	-0.5 to V_{DD}+0.5	Vdc
Storage Temperature	Tstorage	-55/125	°C

Reliability

The VCC6 qualification tests include the following:

Table 3. Environnemental 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

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 4. ESD Ratings

Model	Minimum	Conditions
Human Body Model	1000	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

Suggested IR profile

The VCC6 has been qualified to meet the JEDEC standard for Pb-Free assembly. The temperatures and time intervals listed are based on the Pb-Free small body requirements and parameters are listed in Table 5. As the contact pads are gold over nickel, devices can be reflowed at lower temperatures. The VCC6 is hermetically sealed so an aqueous wash is not an issue.

Table 5. 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	10 sec Max
Time at 240°C (max)	t_{p2}	60 sec Max
Ramp Down	R_{DN}	6 °C/sec Max

Table 6. Standard Frequencies (MHz)				
87.000	155.520	156.250	159.375	161.1328
163.235	173.3708	173.438	175.000	187.500

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 - 107 – xxxMxx

Product Family

LVPECL Crystal Oscillator

Frequency in MHz

example: 155M52= 155.520 MHz

Stability Option/Temperature

+/-20ppm over -10 to 70°C

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