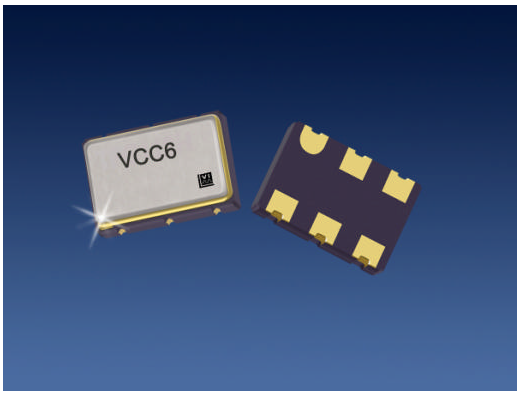
VECTRON INTERNATIONAL
A DOVER COMPANY

VCC6-D

106M250/212M500 Dual Rate PECL and LVDS Oscillator



The VCC6-D Crystal Oscillator

Features

- 3.3V LVPECL or 3.3V LVDS
- Output frequency select
- Enable/Disable output for test and board debug
- Hermetically sealed ceramic SMD package
- Excellent Power Supply Noise Rejection
- Product is compliant to RoHS directive and fully compatible with lead free assembly

Applications

- 1Gbps, 2Gbps, 4 Gbps Fiber Channel
- Storage Area Network
- Host Bus Adapter
- RAID controller

Description

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

The VCC6 uses high quality on-chip multiplier to multiply a 26.5625 crystal to either 106M250 or 212M500.

Performance Characteristics

Table 1. Electrical Performance

Parameter	Symbol	Min	Typical	Max	Units
Frequency	f_O		106.250 / 212.500		MHz
Supply Voltage [1]	V_{DD}	3.0		3.6	V
Supply Current, PECL LVDS	I_{DD}		50 53	65 67	mA
Output Logic Levels, 0/70°C PECL Output Logic High[2] PECL Output Logic Low[2]	 V_{OH} V_{OL}	 V_{DD}-1.025		 V_{DD}-1.620	 V V
LVDS Output High Voltage	V_{OH}			1.475	V
LVDS Output Low Voltage	V_{OL}	0.925			V
LVDS Differential Output Voltage	$\|V_{OD}\|$	250		400	mV
LVDS Change in Magnitude	delta$\|V_{OD}\|$			25	mV
LVDS Offset Output Voltage	V_{OS}	1.125		1.275	V
LVDS Change in Magnitude of Output Offset	delta$\|V_{OS}\|$			25	mV
Transition Times Rise Time[2] Fall Time[2]	 t_R t_F			 600 600	 ps ps
Symmetry or Duty Cycle[3]	SYM	45	50	55	%
Operating temperature		-10/70			°C
Stability (*ordering option)*[4]		+/-50 or +/-100			ppm
RMS Jitter, 12kHz to 20 MHz, f_O<200MHz			0.75		pS
Cycle-Cycle Jitter, rms			4		pS
Output Enabled[5], Frequency Select	V_{IH}	2			V
Output Disabled[5], Frequency Select	V_{IL}			0.8	V
Logic Input Current, High	I_{IH}	-10		+10	uA
Logic Input Current, Low	I_{IL}	-50		+50	uA
Package Size		5.0 x 7.5 x 1.8			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 measured defined as Vs, On Time/Period.
4. Includes calibration tolerance, operating temperature, supply voltage variations, aging (40 degreesC/10 years) and shock and vibration (not under operation). Aging budget is +/-5 ppm.
5. Output w ill be enabled if enable/disable is left open. Output frequency=106M250 if FREQ is left open.

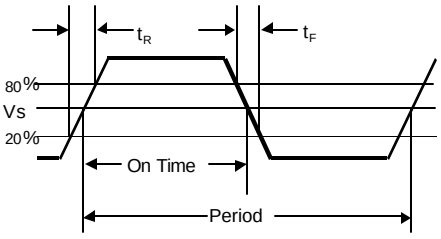


Figure 1. Output Waveform

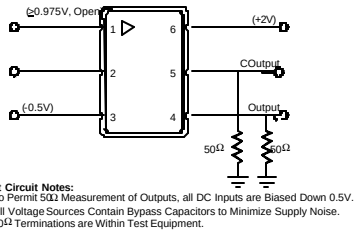
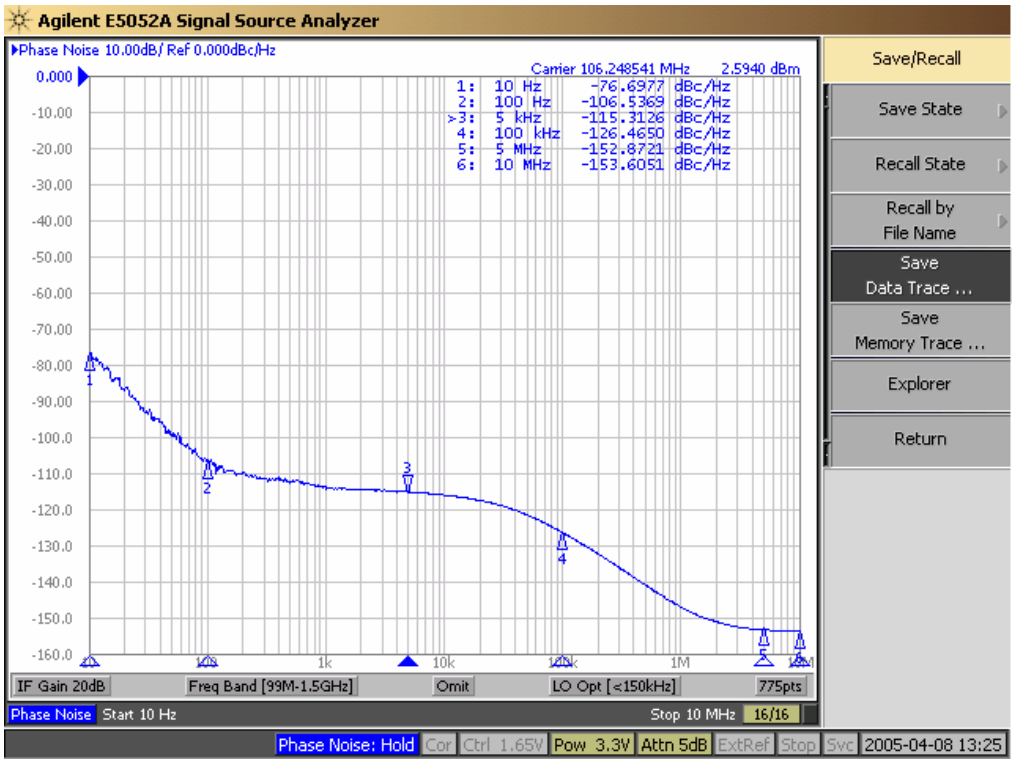
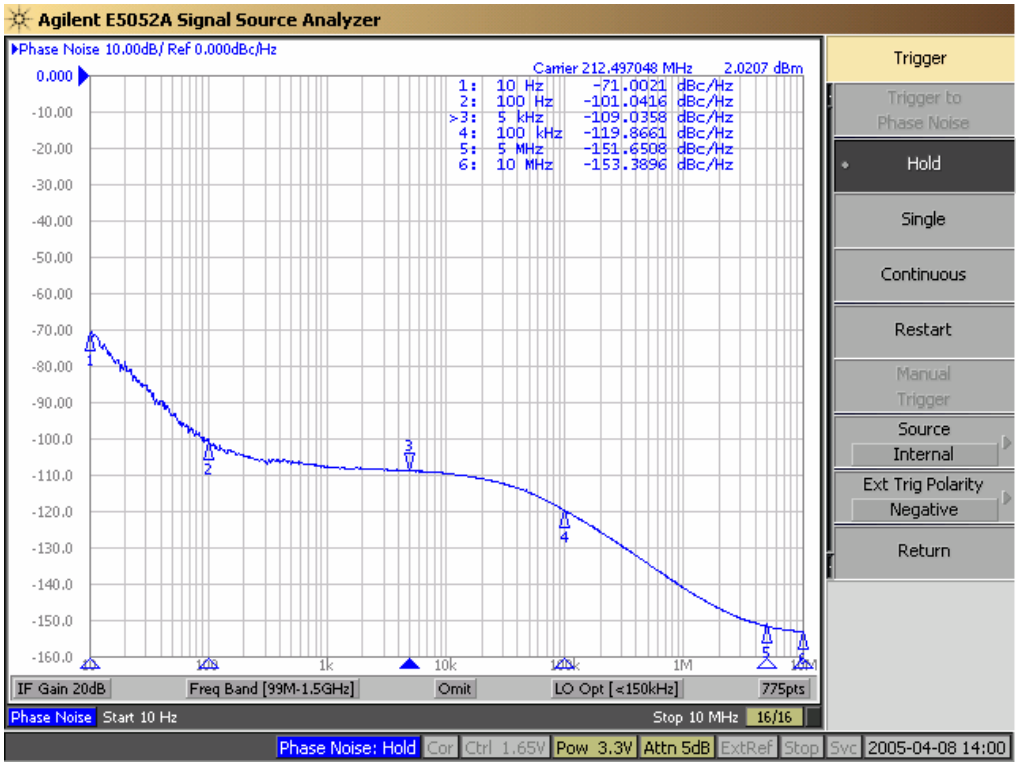


Figure 2. Typical Output Test Conditions (25±5°C)

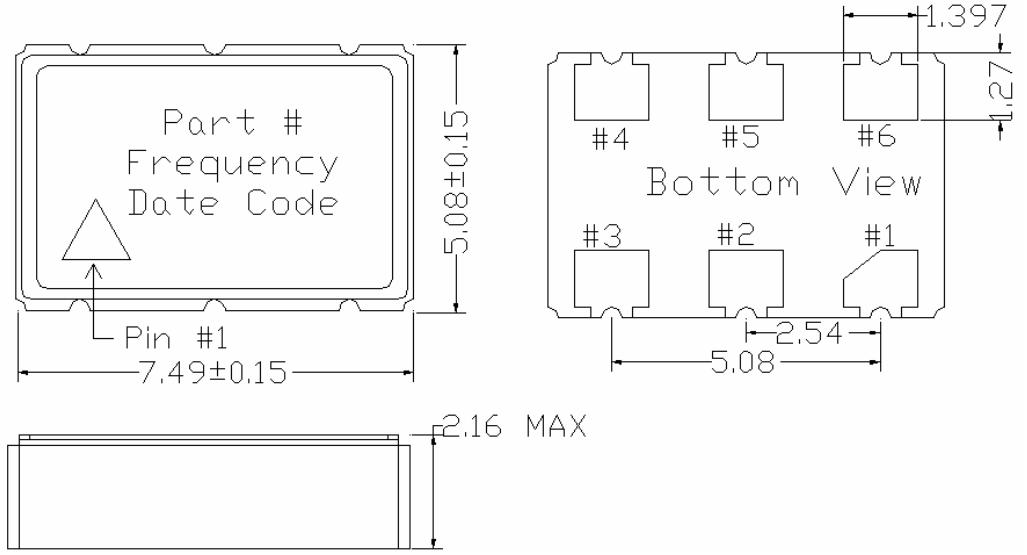


Typical Phase Noise at 106.25MHz



Typical Phase Noise at 212.50MHz

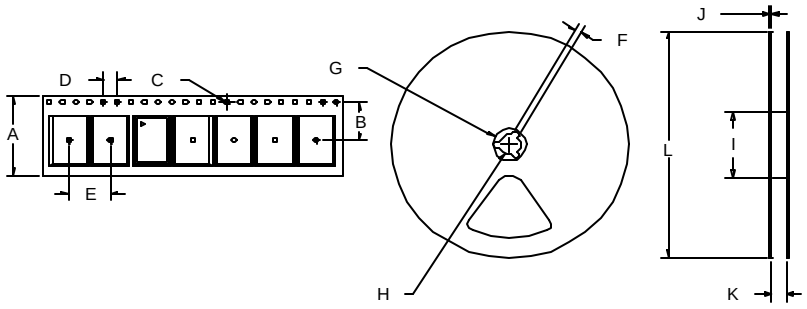
Outline Diagram and Pin Out



Contact pads are gold over nickel

Pin #	Symbol	Function
1	E/D	Output disabled when=logic 0, Output Enabled when=logic1 Device has an internal pull-up resistor.
2	FREQ	Output=106M25 when = logic 1, 212M50 when = logic 0 Device has as an internal pull-up resistor.
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	12	5.5	1.5	4	8	1.78	20.6	13	55	6	12.4	178	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 +5.0	Vdc
Enable/Disable	V_{IN}	-0.5 to V_{DD}+0.5	Vdc
Storage Temperature	Tstorage	-55/125	°C

Reliability

The VCC6 qualification tests will 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

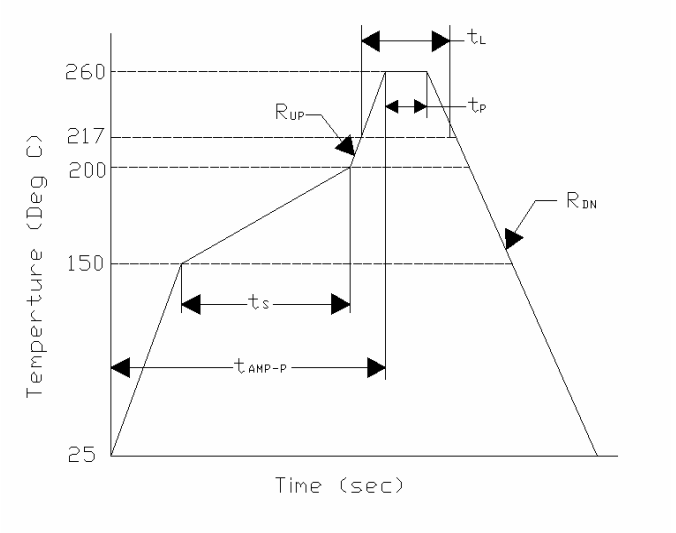
Model	Minimum	Conditions
Human Body Model	1000	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

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 7. The VCC6 is hermetically sealed so an aqueous wash is not an issue.

Table 7. 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



Frequencies (MHz) which are being developed				
106.25/212.50				

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-Dxx – 106M25

Product Family

Crystal Oscillator

Supply Voltage, Output

D= Dual Rate

PECL/LVDS

Q: 3.3volt, LVPECL

L: 3.3volt, LVDS

Frequency MHz

example: 106M250= 106.25/212.50MHz

Stability Options/Temperature

A: +/-100ppm/ -10 to 70 C

B: +/-50ppm/-10 to 70 C

Also available is a VCC6-1091 which is fixed at 212.500MHz, LVPECL, 50ppm over -10 to 70C, and a VCC6-1121 which is fixed at 212.500MHz, LVPECL and is 100ppm over -10 to 70C.

For Additional Information, Please Contact:

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