VCE1 series
3.3, 5.0 volt CMOS Oscillator

The VCE1 Crystal Oscillator

f_o

Output Buffer / Disable
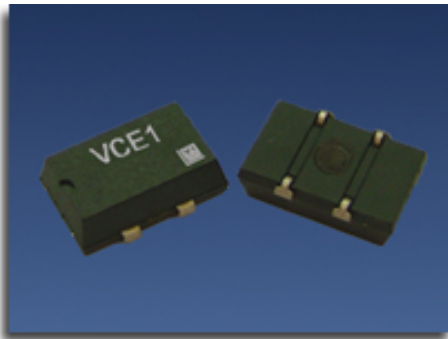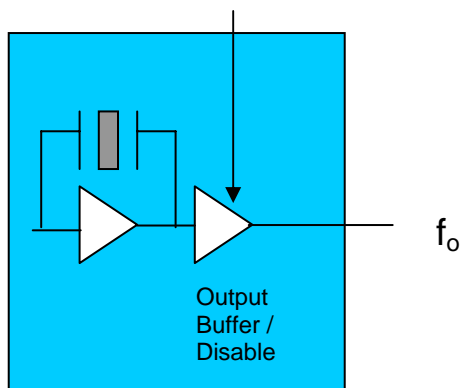
Features

- CMOS output
- Output frequencies to 66.667 MHz
- Tri-state output for board test and debug
- 0/70 or –40/85 °C operating temperature
- Low cost industry standard 14x9.8 mm package
- RoHS and lead free compliant construction

Applications

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

Description

Vectron's VCE1 Crystal Oscillator (XO) is quartz stabilized square wave generator with a CMOS output, operating off a 3.3 or 5.0 volt supply.

Performance Characteristics

Table 1. Electrical Performance, 5V option

Parameter	Symbol	Min	Typical	Maximum	Units
Frequency	f_O	1.000		66.667	MHz
Operating Supply Voltage [1]	V_{DD}	4.5	5.0	5.5	V
Absolute Maximum Supply Voltage		-0.7		7.0	V
Supply Current, Output Enabled	I_{DD}			40	mA
Output Logic Levels					
Output Logic High[2]	V_{OH}	$0.9*V_{DD}$			V
Output Logic Low[2]	V_{OL}			$0.1*V_{DD}$	V
Output Rise/Fall Time[2]	t_R/t_F			8	ns
Duty Cycle[3] (ordering option)	SYM		40/60 or 45/55		%
Operating Temperature (ordering option)	T_{OP}		0/70 or -40/85		°C
Storage Temperature	T_{STOR}	-55		125	°C
Stability[4] (ordering option)	$\Delta F/T$		±50, ±100		ppm
Output Enable/Disable[5]	E/D				V
Output Enabled		4.0			
Output Disabled				0.8	
Start-up time	T_{SU}			10	ms

Table 2. Electrical Performance, 3.3V option

Parameter	Symbol	Min	Typical	Maximum	Units
Frequency	f_O	1.000		66.667	MHz
Operating Supply Voltage [1]	V_{DD}	2.97	3.3	3.63	V
Absolute Maximum Operating Voltage		-0.5		5.0	V
Supply Current, Output Enabled	I_{DD}			40	mA
Output Logic Levels					
Output Logic High[2]	V_{OH}	$0.9*V_{DD}$			V
Output Logic Low[2]	V_{OL}			$0.1*V_{DD}$	V
Output Rise/Fall Time[2]	t_R/t_F			8	ns
Duty Cycle[3] (ordering option)	SYM		40/60 or 45/55		%
Operating Temperature (ordering option)	T_{OP}		0/70 or –40/85		°C
Storage Temperature	T_{STOR}	-55		125	°C
Stability[4] (ordering option)	$\Delta F/T$		±50, ±100		ppm
Output Enable/Disable[5]	E/D				V
Output Enabled		2.0			
Output Disabled				0.5	
Start-up time	T_{SU}			10	ms

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 3 defines these parameters. Figure 4 illustrates the operating conditions under which these parameters are tested and specified. For Fo>90MHz, rise and fall time is measured 20 to 80%.
3. Symmetry is measured defined as On Time/Period.
4. Includes calibration tolerance, operating temperature, supply voltage variations, aging and shock and vibration.
5. Output will be enabled if enable/disable is left open.
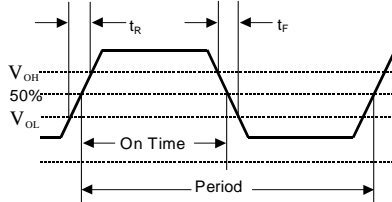
Figure 3. Output Waveform
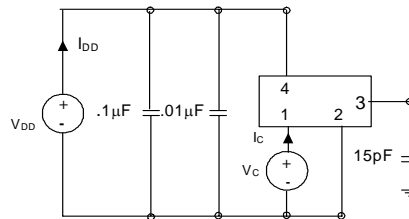
Figure 4. Typical Output Test Conditions (25±5°C)

Enable/Disable Functional Description

Under normal operation the Enable/Disable is left open or set to a logic high state. When the E/D is set to a logic low, the oscillator stops and the output is in a high impedance state. This helps reduce power consumption as well as facilitating board testing and troubleshooting.

Tri-state Functional Description

Under normal operation the tri-state is left open or set to a logic high state. When the tri-state is set to a logic low, the oscillator remains active but the output buffer is in a high impedance state. This helps facilitate board testing and troubleshooting.

Table 3. Outline Diagrams and Pin Out

Pin #	Symbol	Function
1	E/D or NC	Tri-state, Enable/Disable or NC
2	GND	Electrical and Case Ground
3	f_O	Output Frequency
4	V_{DD}	Supply Voltage
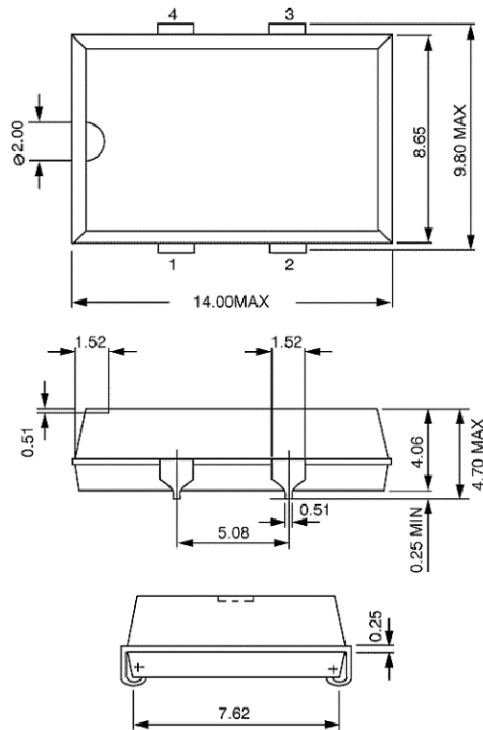
Pin #	Function
1	NC/3-State
2	GND
3	OUT
4	VDD

Figure 5, Package drawing

VCE1 Data Sheet

Reliability
The VCE1 qualification tests have included:

Table 4. Environnemental Compliance	
Parameter	**Conditions**
Mechanical Shock	MIL-STD-883 Method 2022
Mechanical Vibration	MIL-STD-883 Method 2007
Temperature Cycle	MIL-STD-883 Method 1010
Gross and Fine Leak	MIL-STD-883 Method 1014
Resistance to Solvents	MIL-STD-883 Method 2015

Handling Precautions
Although ESD protection circuitry has been designed into the the VCE1, 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 5. ESD Ratings		
Model	**Minimum**	**Conditions**
Human Body Model	1000	MIL-STD-883 Method 3115
Charged Device Model	1500	JESD 22-C101

Suggested IR profile
Devices are built using lead free epoxy, but are only rated for a maximum 240°C reflow. A typical reflow profile is shown below in Figure 6.
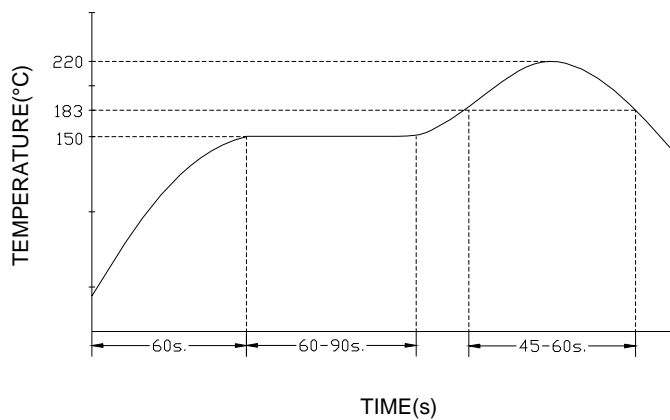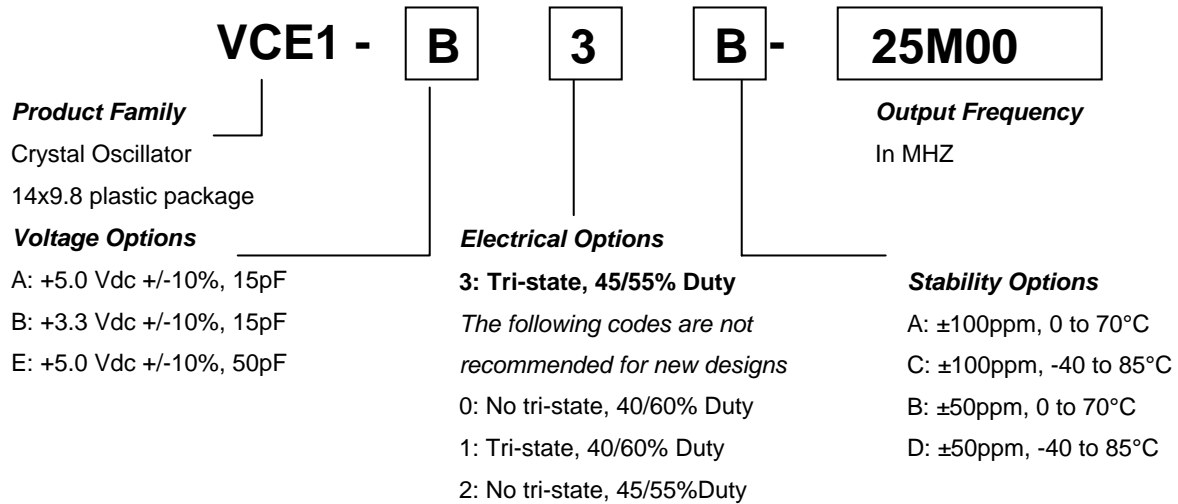

Figure 6. Suggested Reflow Profile

Ordering Information:

VCE1 -	B	3	B -	25M00

Product Family

Crystal Oscillator

14x9.8 plastic package

Voltage Options

A: +5.0 Vdc +/-10%, 15pF

B: +3.3 Vdc +/-10%, 15pF

E: +5.0 Vdc +/-10%, 50pF

Electrical Options

3: Tri-state, 45/55% Duty

The following codes are not
recommended for new designs

0: No tri-state, 40/60% Duty

1: Tri-state, 40/60% Duty

2: No tri-state, 45/55%Duty

Output Frequency

In MHZ

Stability Options

A: ±100ppm, 0 to 70°C

C: ±100ppm, -40 to 85°C

B: ±50ppm, 0 to 70°C

D: ±50ppm, -40 to 85°C

Note: Not all combinations are available.

Tri-state with a 45/55% is the most common Electrical code and is recommended for most applications.

Devices will be shipped in Anti Static Tubes

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Standard Clock Oscillators *category:*

Click to view products by Vectron *manufacturer:*

Other Similar products are found below :

601252 F335-12 F335-25 F535L-33.333 F535L-50 ASV-20.000MHZ-LR-T ECS-2018-160-BN-TR EL13C7-H2F-125.00M MXO45HS-2C-66.6666MHZ SiT8209AI-32-33E-125.000000 SM4420TEV-40.0M-T1K F335-24 F335-40 F535L-10 F535L-12 F535L-16 F535L-24 F535L-27 F535L-48 PE7744DW-100.0M CSX-750FCC14745600T ASF1-3.686MHZ-N-K-S XO57CTECNA3M6864 ECS-2100A-147.4 601251 EP16E7E2H26.000MTR SIT8918AA-11-33S-16.000000G XO3003 9120AC-2D2-33E212.500000 9102AI-243N25E100.00000 8208AC-82-18E-25.00000 ASDK2-32.768KHZ-LR-T3 8008AI-72-XXE-24.545454E 8004AC-13-33E-133.33000X AS-4.9152-16-SMD-TR ASFL1-48.000MHZ-LC-T SIT8920AM-31-33E-25.0000 DSC1028DI2-019.2000 9121AC-2C3-25E100.00000 9102AI-233N33E100.00000X 9102AI-233N25E200.00000 9102AI-232H25S125.00000 9102AI-133N25E200.00000 9102AC-283N25E200.00000 9001AC-33-33E1-30.000 XLH536125.000JS4I 3921AI-2CF-33NZ125.000000 5730-1SF PXA000010 SIT1602BC-83-33E-10.000000Y