VT-822

Temperature Compensated Crystal Oscillator

Description

Vectron's VT-822 Temperature Compensated Crystal Oscillator (TCXO) is a quartz stabilized, CMOS output, analog temperature compensated oscillator, operating off either a 2.5 or 3.3 volt supply, in a hermetically sealed 3.2x2.5 ceramic package.

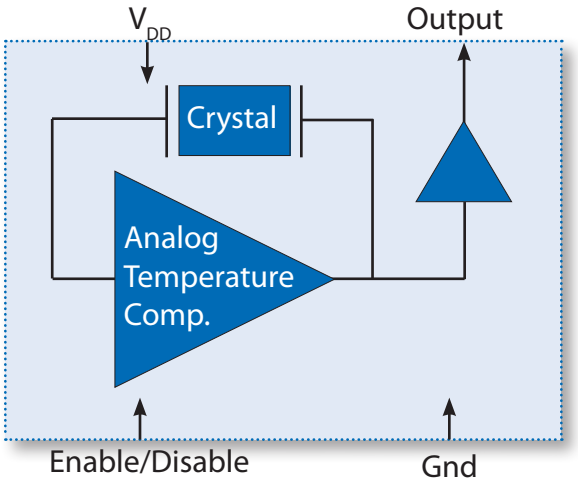
Features

- CMOS Output
- Output Frequencies to 54 MHz
- Enable Disable Function
- Fundamental Crystal Design
- Hermetically Sealed Ceramic SMD package
- Product is compliant to RoHS directive and fully compatible with lead free assembly

Applications

- WiMAX, Wi-Fi,Wi-LAN
- Wireless Communications
- Base Stations
- Point to point radios
- Broadband Access
- Test Equipment
- Handsets
- Networking

Block Diagram



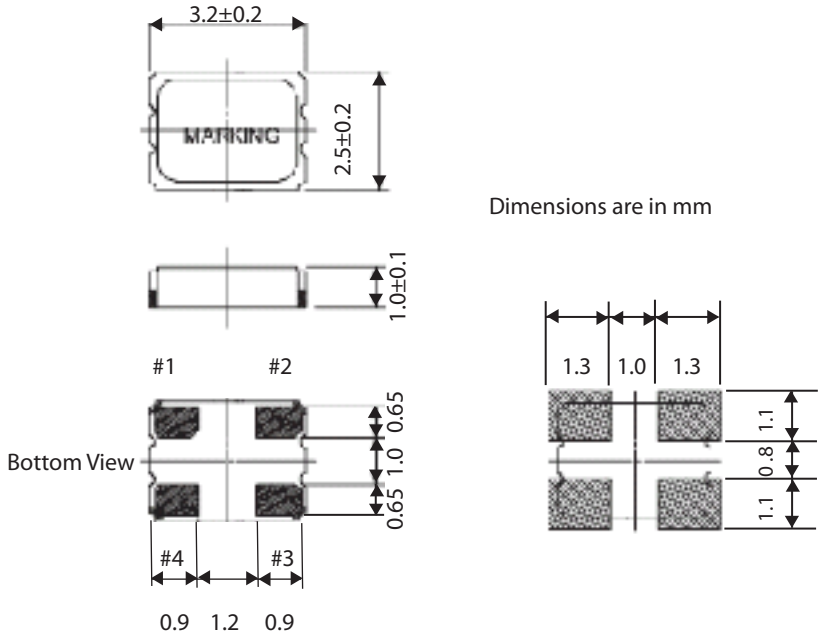
Specifications

Table 1. Electrical Performance					
Parameter	Symbol	Min.	Typ	Max	Units
Output Frequency	f_O	4		54	MHz
Supply Voltage,[1] (Ordering Option)	V_{DD}		+2.5 or +3.3		V
Supply Current, to 19.999 MHz 20.001 - 55.000MHz	I_{DD}			3.0 7.0	mA
Operating Temperature, (Ordering Option)	T_{OP}		-20/70 or -40/85		℃
STABILITY					
Stability Over T_{OP}, (Ordering Option)			±2.0, ±2.5, ±5.0		ppm
Initial Accuracy[2]				±2.0	ppm
Power Supply Stability				±0.2	ppm
Load Stability				±0.2	ppm
Aging				±1.0	ppm/1st yr
OUTPUT					
Output Level[2]	V_{OH} V_{OL}	0.9*V_{DD}		 0.1*V_{DD}	V
Output Load				15pF	
Output Rise and Fall Time				5	ns
Duty Cycle		45		55	%
Phase Noise, 10.000MHz 10Hz 100Hz 1kHz 10kHz 100kHz			 -75 -111 -141 -152 -156		dBc/Hz
Jitter[3]			2.1 20.0		ps rms ps pk-pk
Start-Up Time				2	ms
ENABLE/DISABLE					
Output Enabled Output Disabled		0.7*V_{DD} or open		 0.3*V_{DD}	V V
Package Size			3.2x2.5		

1. The VT-822 power supply pin should be filtered, eg, a 10uF, 0.1 and 0.01uf capacitor
2. Intial accuracy is guarenteed sixty minutes after a 260C reflow.
3. The Output is DC coupled.
4. Jitter is measured is a Wavecrest SIA3300C, 90K samples

Outline Drawing and Recommended Layout

Table 2. Pinout		
Pin #	Symbol	Function
1	E/D	Enable/Disable
2	GND	Electrical and Lid Ground
3	f_o	Output Frequency
4	V_{DD}	Supply Voltage



Maximum Ratings

Absolute Maximum Ratings and Handling Precautions
Stresses in excess of the absolute maximum ratings can permanently damage the device. Functional operation is not implied or any other 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.

Although ESD protection circuitry has been designed into the VT-822, proper precautions should be taken when handling and mounting, VI employs a Human Body Model and Charged Device Model for ESD susceptibility testing and design evaluation.
ESD thresholds are dependent on the circuit parameters used to define the model. Although no industry standard has been adopted for the CDM a standard resistance of 1.5kOhms and capacitance of 100pF is widely used and therefor can be used for comparison purposes.

Table 3. Maximum Ratings			
Parameter	Symbol	Rating	Unit
Storage Temperature	T_{STORE}	-40/125	°C
Supply Voltage	V_{DD}	-0.3/4	V
Enable Disable Voltage	E/D	V_{DD}	V
ESD, Human Body Model	HBM	1500	V
ESD, Charged Device Model	CDM	1000	V

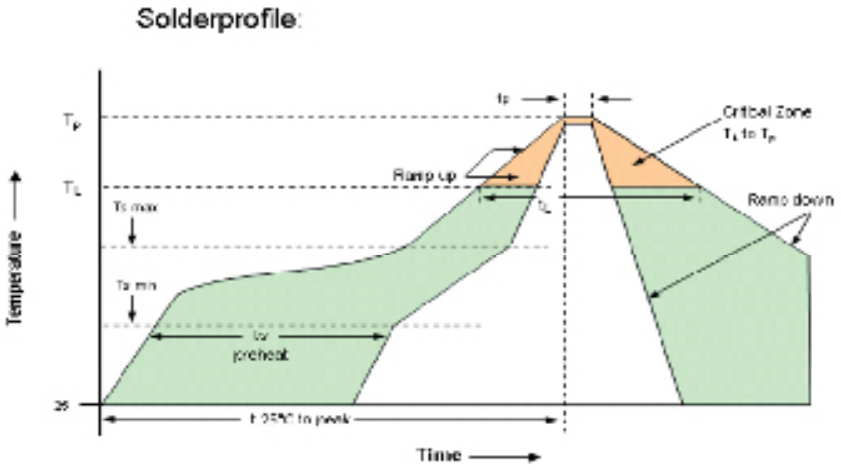
Table 4. Environmental Compliance	
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002
Mechanical Vibration	MIL-STD-883 Method 2007
Temperature Cycle	MIL-STD-883 Method 1010
Solderability	MIL-STD-883 Method 2003
Fine and Gross Leak	MIL-STD-883 Method 1014
Resistance to Solvents	MIL-STD-883 Method 2015
Moisture Sensitivity Level	MSL1
Contact Pads	Gold (0.3um min - 1.0um max) over Nickel

IR Reflow

Suggested IR Profile

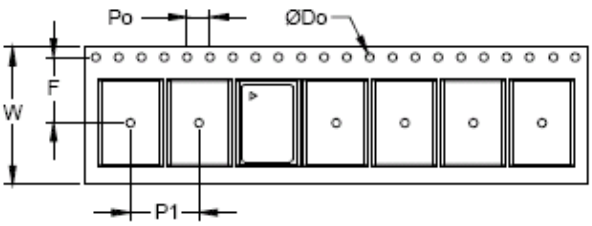
Devices are built using lead free epoxy and can be subjected to standard lead free IR reflow conditions shown in Table 5. Contact pads are gold over nickel and lower maximum temperatures can also be used, such as 220C.

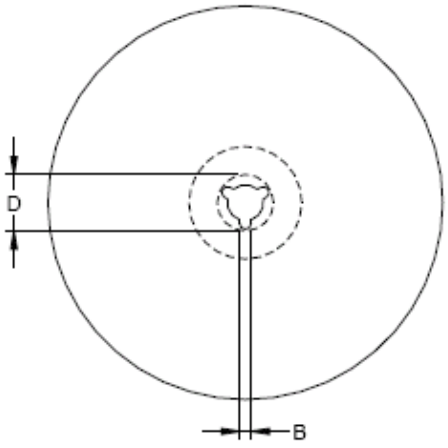
Table 5. Reflow Profile		
Parameter	Symbol	Value
PreHeat Time Ts-min Ts-max	t_s	200 sec Max 150°C 200°C
Ramp Up	R_{UP}	3°C/sec Max
Time above 217C	t_L	150 sec Max
Time to Peak Temperature	$t_{25C\ to\ peak}$	480 sec Max
Time at 260C	t_P	10 sec Max
Time at 240C	t_{P2}	60 sec Max
Ramp down	R_{DN}	6°C/sec Max



Tape & Reel

Table 6. Tape and Reel Information												
Tape Dimensions (mm)					Reel Dimensions (mm)							
W	F	Do	Po	P1	A	B	C	D	N	W1	W2	#/Reel
18	1.75	1.55	4	4	178	2.5	13	22	60	11.5	15	1000





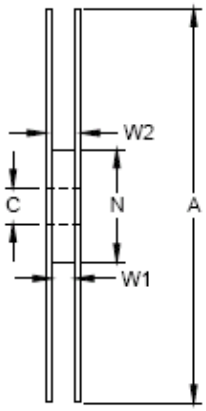
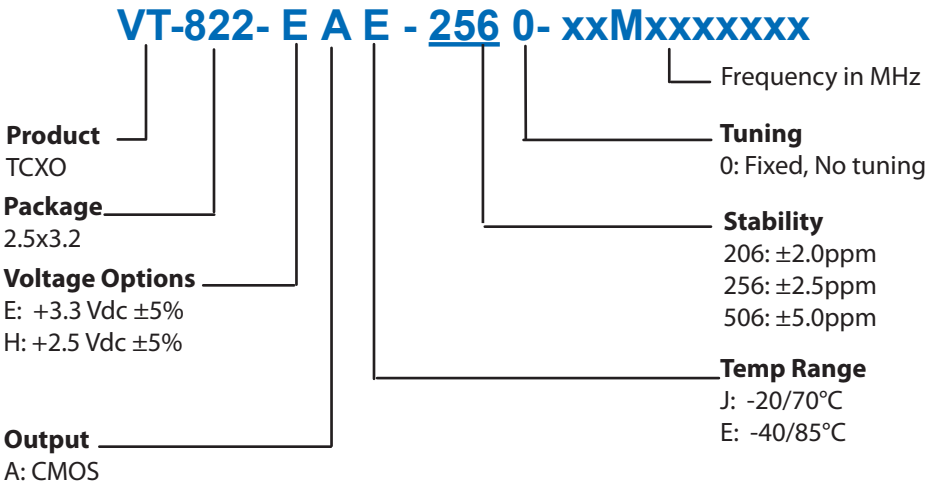


Table 7. Standard Frequencies (MHz)									
8.1920	10.000	10.250	12.000	12.800	13.000	14.000	14.7456	15.360	15.000
16.000	16.376	16.366667	16.367667	16.3677673	16.368	16.369	16.736	16.800	19.200
19.6608	19.680	19.680	20.000	22.000	25.000	26.000	27.000	27.4560	30.4000
30.720	38.400	40.000	45.000	50.000	52.000				

Ordering Information



**Note: not all combination of options are available.*
Other specifications may be available upon request.

Example: VT-822-EAE-2560-10M0000000

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Rev: 02/11/2014