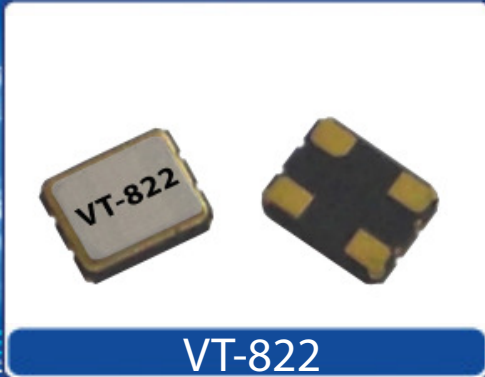



Helping Customers Innovate, Improve & Grow


VT-822

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 mm ceramic package.

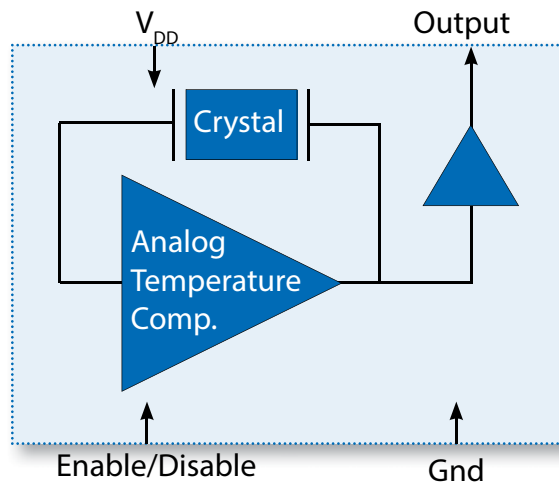
Features

- 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			°C
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 ³	V_{OH} V_{OL}	$0.9 \cdot V_{DD}$		$0.1 \cdot V_{DD}$	V
Output Drive	I_{OH} I_{OL}	4		-4	mA mA
Output Load				15pF	
Output Rise and Fall Time				5	ns
Duty Cycle		45		55	%
Phase Noise ⁴ , 10.000MHz 10Hz 100Hz 1kHz 10kHz 100kHz			-75 -111 -141 -152 -156		dBc/Hz
Jitter ⁵			2.1 20.0		ps rms ps pk-pk
Start-Up Time				2	ms
ENABLE/DISABLE					
Output Enabled		$0.7 \cdot V_{DD}$ or open			V
Output Disabled				$0.3 \cdot V_{DD}$	V
Package Size		3.2 x 2.5			

1. The VT-822 power supply pin should be filtered, eg, a 10uF, 0.1 and 0.01uf capacitor
2. Initial accuracy is guaranteed sixty minutes after a 260C reflow.
3. The Output is DC coupled.
4. Measured at room ambient temperature using an Agilent E5052 Signal Source Analyzer
5. Jitter is measured is a Wavecrest SIA3300C, 90K samples

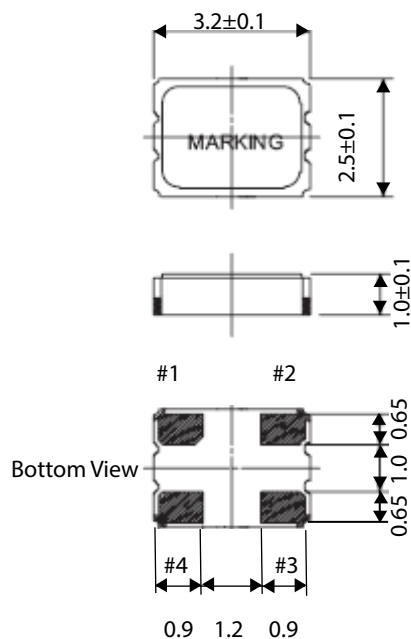
Outline Drawing and Recommended Layout

Table 2. Pinout

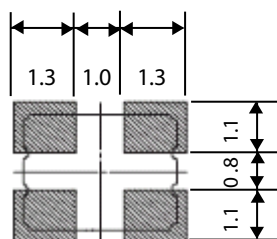
Pin #	Symbol	Function
1	E/D	Enable/Disable
2	GND	Electrical and Lid Ground
3	f_o	Output Frequency
4	V_{DD}	Supply Voltage

Table 3. Enable Disable Function

Pin 1	Pin 3 Output
High	Clock Output
Open	Clock Output
Low	High Impedance



Dimensions are in mm



Marking

V XXMXXX

.YYWWC

V=Vectron

XXMXXX = Frequency

YY = Year

WW = Week

C = Manufacturing Location

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, Vectron 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 therefore can be used for comparison purposes.

Table 4. 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 5. 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
Weight	26 mg

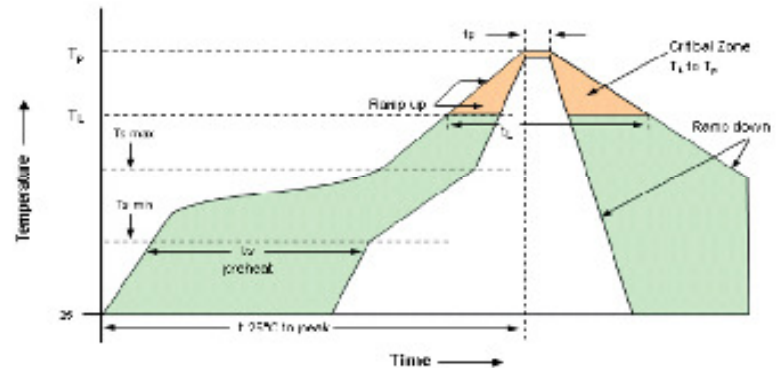
IR Compliance

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 6. Reflow Profile		
Parameter	Symbol	Value
PreHeat Time	t_s	200 sec Max
Ramp Up	R_{UP}	3°C/sec Max
Time above 217°C	t_L	150 sec Max
Time to Peak Temperature	t_{AMB-P}	480 sec Max
Time at 260°C	t_P	30 sec Max
Time at 240°C	t_{P2}	60 sec Max
Ramp down	R_{DN}	6°C/sec Max

Solderprofile:



Tape and Reel

Table 7 . Tape Dimensions						Reel Dimensions (mm)							
Tape Dimensions (mm)						Reel Dimensions (mm)							
Dimension	W	F	Do	Po	P1	A	B	C	D	N	W1	W2	# Per Reel
Tolerance	Typ	Typ	Typ	Typ	Typ	Typ	Min	Typ	Min	Min	Typ	Max	
VT-822	8	3.5	1.5	4	4	178	2	13	21	60	10	14	3000

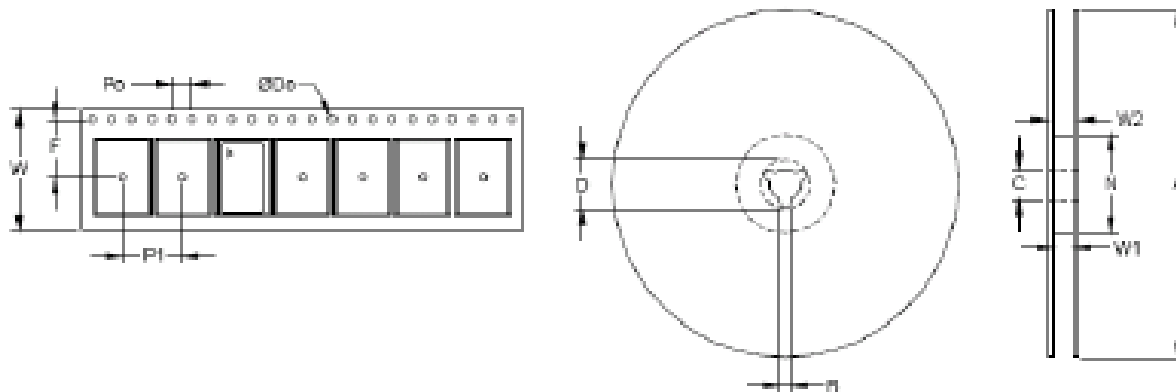


Table 8. Standard Frequencies (MHz)

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

VT-822- E A E - 256 0- xxMxxxxxxxXX

Product

TCXO

Package

3.2x2.5 mm Ceramic

Voltage Options

E: +3.3 Vdc ±5%

H: +2.5 Vdc ±5%

Output

A: CMOS

Temp Range

J: -20/70°C

E: -40/85°C

Packaging

TR: Tape and Reel

blank: Cut Tape / non Tape and Reel quantities

_SNPB: Tin lead solder dipped

Frequency in MHz

Tuning

0: Fixed, No tuning

Stability

206: ±2.0ppm

256: ±2.5ppm

506: ±5.0ppm

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

Example:

VT-822-EAE-2060-24M5760000TR

VT-822-EAE-2060-24M5760000

VT-822-EAE-2060-24M5760000_SNPB

Tape and Reel

Cut Tape

Tin lead solder dipped

Revision History

Revision Date	Approved	Description
Aug 10, 2018	FB	Update logo and contact information, add "SNPB" ordering option
May 25, 2019	FB	Update logo and contact information, change "SNPB" ordering option to "SNPB"
April 30, 2020	FB	Add tape and reel ordering option

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