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VT-802

## Description

Vectron's VT-802 Temperature Compensated Crystal Oscillator (TCXO) is a quartz stabilized, CMOS output, analog temperature compensated oscillator, operating off either 2.5 or 3.3 volt supply in a hermetically sealed 5.0 x 3.2 ceramic package.

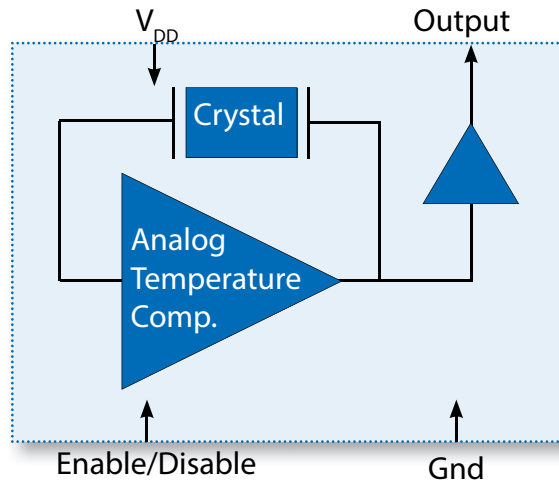
## Features

- CMOS Output
- Low Power
- Output Frequencies to 50 MHz
- Low Jitter 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

## Block Diagram



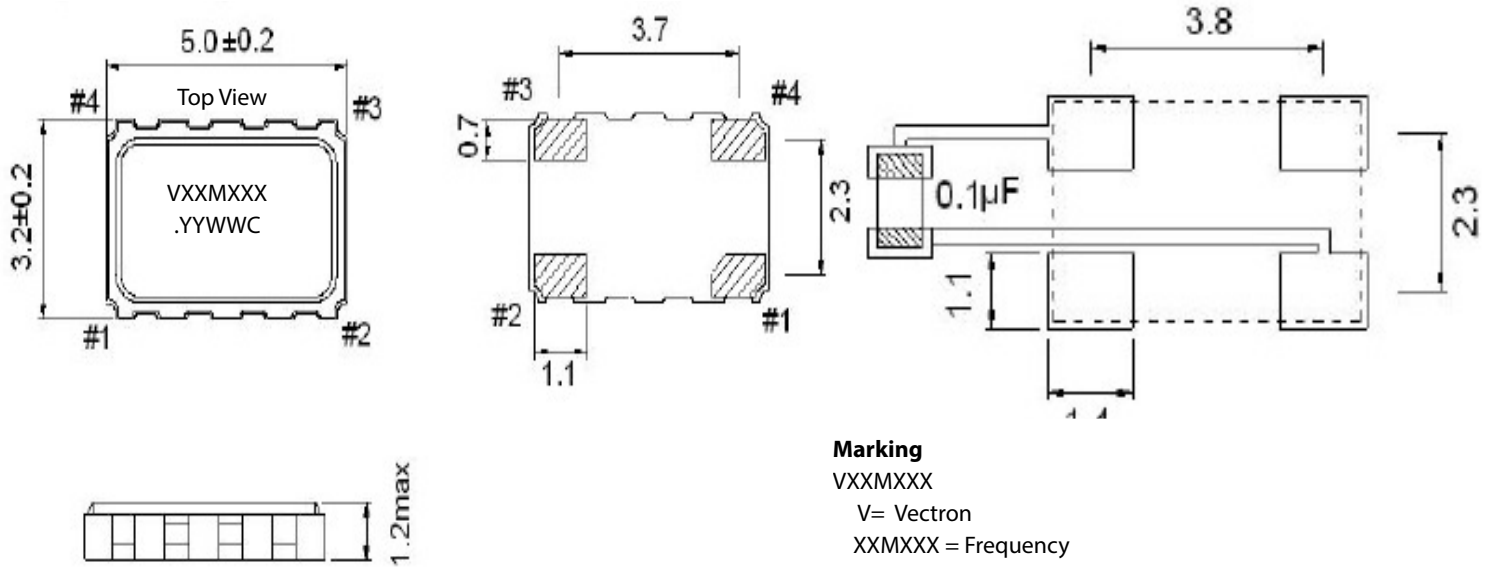
## Specifications

**Table 1. Electrical Performance**

Parameter	Symbol	Min.	Typ	Max	Units
Output Frequency	f <sub>O</sub>	2		50	MHz
Supply Voltage <sup>1</sup> , <i>Ordering Option</i>	V <sub>DD</sub>	+2.5 or +3.3			V
Supply Current, 5 to 19.999MHz 20.000 to 50.0000MHz	I <sub>DD</sub>			3 5	mA mA
Operating Temperature, <i>Ordering Option</i>	T <sub>OP</sub>	-20/70 or -40/85			°C
STABILITY					
Stability Over T <sub>OP</sub> <i>Ordering Option</i>		±2.0, ±2.5, ±5.0 or ±10			ppm
Initial Accuracy <sup>2</sup>				±1.0	ppm
Power Supply Stability				±0.5	ppm
Load Stability				±0.2	ppm
Aging				±1.0	ppm/yr
OUTPUT					
Output Logic High <sup>3</sup> Output Logic Low	V <sub>OH</sub> V <sub>OL</sub>	0.9*V <sub>DD</sub>		0.1*V <sub>DD</sub>	V
Output Load				15	pF
Output Rise and Fall Time	t <sub>R</sub> /t <sub>F</sub>			6	ns
Duty Cycle		45		55	%
Phase Noise <sup>4</sup> , 12.800MHz 10Hz 100Hz 1kHz 10kHz 100kHz	0 <sub>N</sub>		-70 -108 -138 -155 -159		dBc/Hz
Start Up Time	t <sub>SU</sub>			2	ms
Enable Disable Function					
Input Logic High <sup>5</sup> Input Logic Low	V <sub>IH</sub> V <sub>IL</sub>	0.3*V <sub>DD</sub>		0.7*V <sub>DD</sub>	V V
Package		5x3.2x1.1			mm

1. The VT-802 power supply pin should be filtered, eg, a 0.1 and 0.01uf capacitor.
2. initial Accuraccy before reflow. Allow an additional  $\pm 1$  ppm shift theough 2 reflows, after 24 hours..
3. The Output is DC coupled.
4. Measured at room ambient temperature using an Agilent E5052B Signal Source Analyzer.
5. The Output is active if the Enable Disable is left open.

## Outline Drawing and Recommended Layout



### Marking

VXXMXXX

V= Vectron

XXMXXX = Frequency

.YYWWC

YY = Year

WW = Week

C = Manufacturing Location

**Table 2. Pinout**

Pin #	Symbol	Function
1	E/D	Enable/Disable Function
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

## 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-802, 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 therefor can be used for comparison purposes.

**Table 4. Maximum Ratings**

Parameter	Symbol	Rating	Unit
Storage Temperature	$T_{STORE}$	-55/125	°C
E/D Voltage	E/D	0/ $V_{DD}$	V
ESD, Human Body Model		1000	V
ESD, Charged Device Model		1000	V

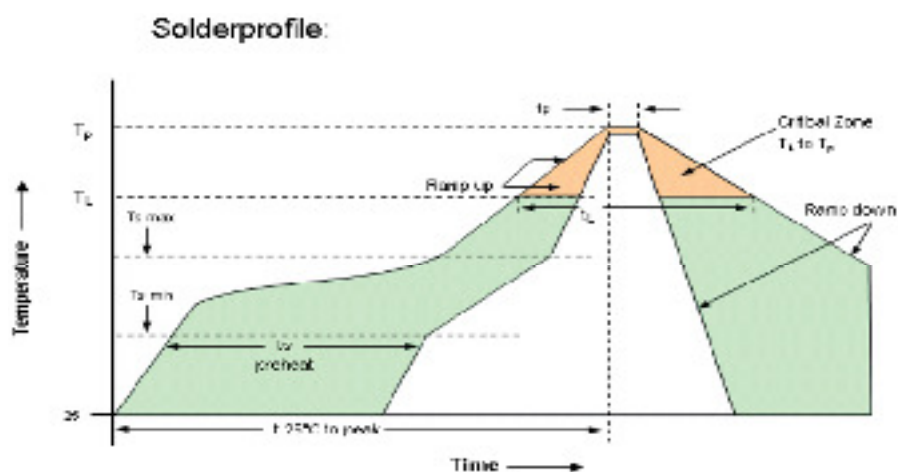
Table 5. Environmental Compliance	
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002
Mechanical Vibration	MIL-STD-883 Method 2007
Temperature Cycle	MIL-STD-883 Method 1010
Solderability	MIL-STD-883 Method 2003
Fine and Gross Leak	MIL-STD-883 Method 1014
Resistance to Solvents	MIL-STD-883 Method 2015
Moisture Sensitivity Level	MSL1
Contact Pads	Gold 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.

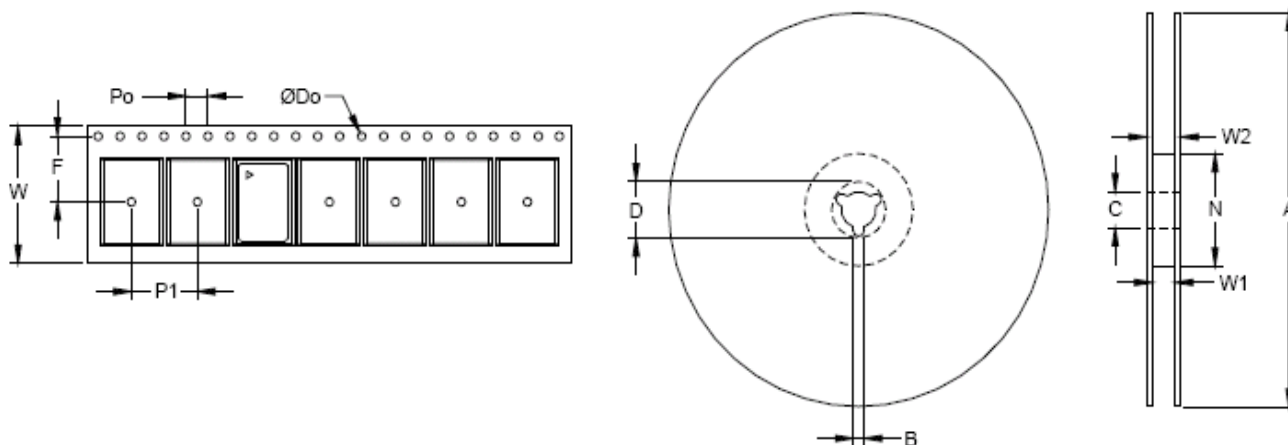
Table 6. Reflow Profile		
Parameter	Symbol	Value
PreHeat Time	$t_s$	200 sec Max
Ts-min		150°C
Ts-max		200°C
Ramp Up	$R_{UP}$	3°C/sec Max
Time above 217C	$t_L$	150 sec Max
Time to Peak Temperature	$t_{25C \text{ to peak}}$	480 sec Max
Time at 260C	$t_p$	30 sec Max
Time at 240C	$t_{p2}$	60 sec Max
Ramp down	$R_{DN}$	6°C/sec Max



## Tape & Reel

**Table 7. Tape and Reel Information**

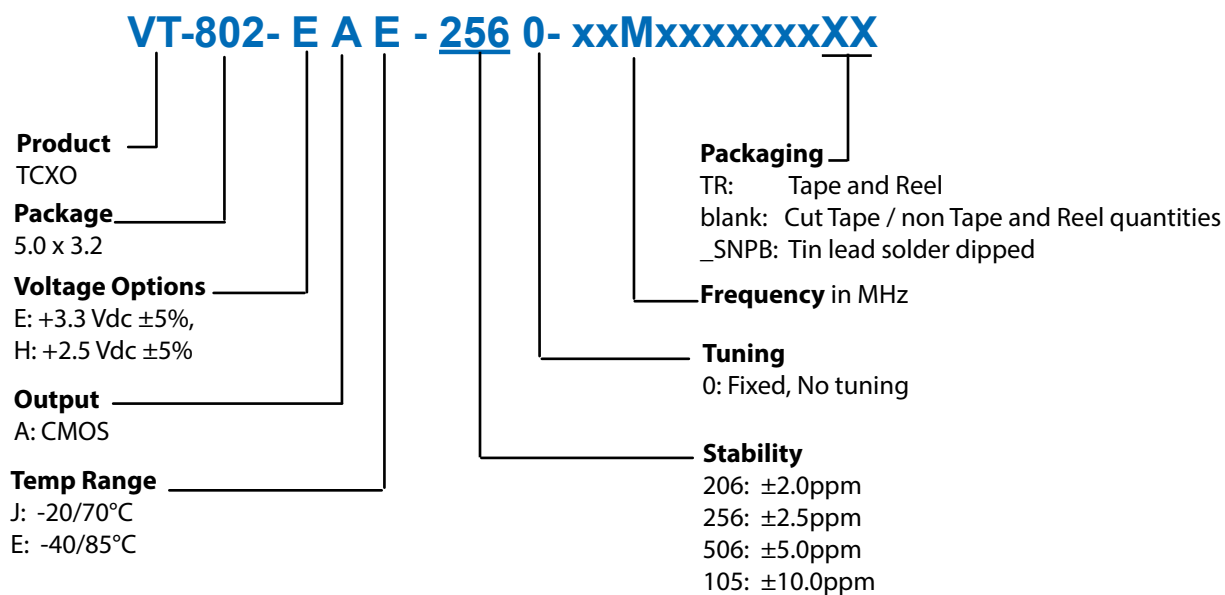
Tape Dimensions (mm)					Reel Dimensions (mm)							
W	F	Do	Po	P1	A	B	C	D	N	W1	W2	#/Reel
12	5.5	1.5	4	4	178	2.5	13	22	60	11.5	15	1000



**Table 8. Standard Frequencies (MHz)**

2.04815328	10.000	12.800	14.7456	16.384	19.200	19.440	20.000	25.000	26.000
27.000	32.000	40.000	50.000						

## Ordering Information



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

## Revision History

Revision Date	Approved	Description
Aug 10, 2018	FB	Update logo and contact information, add "SNPBDIP" ordering option
Dec 31, 2019	FB	Update logo and contact information, change "SNPBDIP" to "SNPB", update tape and reel width to 12mm
April 30, 2020	FB	Add tape and reel ordering option

## Contact Information

### **USA:**

100 Watts Street  
Mt Holly Springs, PA 17065  
Tel: 1.717.486.3411  
Fax: 1.717.486.5920

### **Europe:**

Landstrasse  
74924 Neckarbischofsheim  
Germany  
Tel: +49 (0) 7268.801.0  
Fax: +49 (0) 7268.801.281



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