




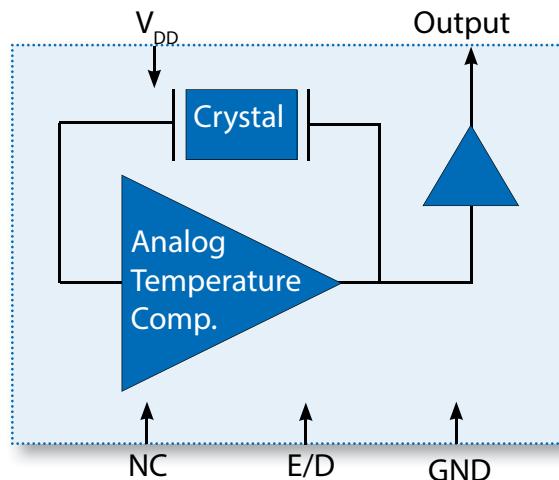
## Description

Microsemi's VT-803-0053-49M1520000 Temperature Compensated Crystal Oscillator (TCXO) is a quartz stabilized, CMOS output, 5th order analog temperature compensated oscillator, operating off a 3.3 volt supply in a hermetically sealed 3.2 x 5.0 mm ceramic package.

## Features

- 49.152MHz Output Frequency
- $\pm 4.6$ ppm accuracy over all conditions including 20 years aging
- $\pm 280$ ppb temperature stability over  $-40/85$  °C
- Fundamental Crystal Design with CMOS output
- Stratum 3 Compliant
- Gold over nickel contact pads
- Hermetically Sealed Ceramic SMD package
- Product is compliant to RoHS directive  and fully compatible with lead free assembly

## Block Diagram

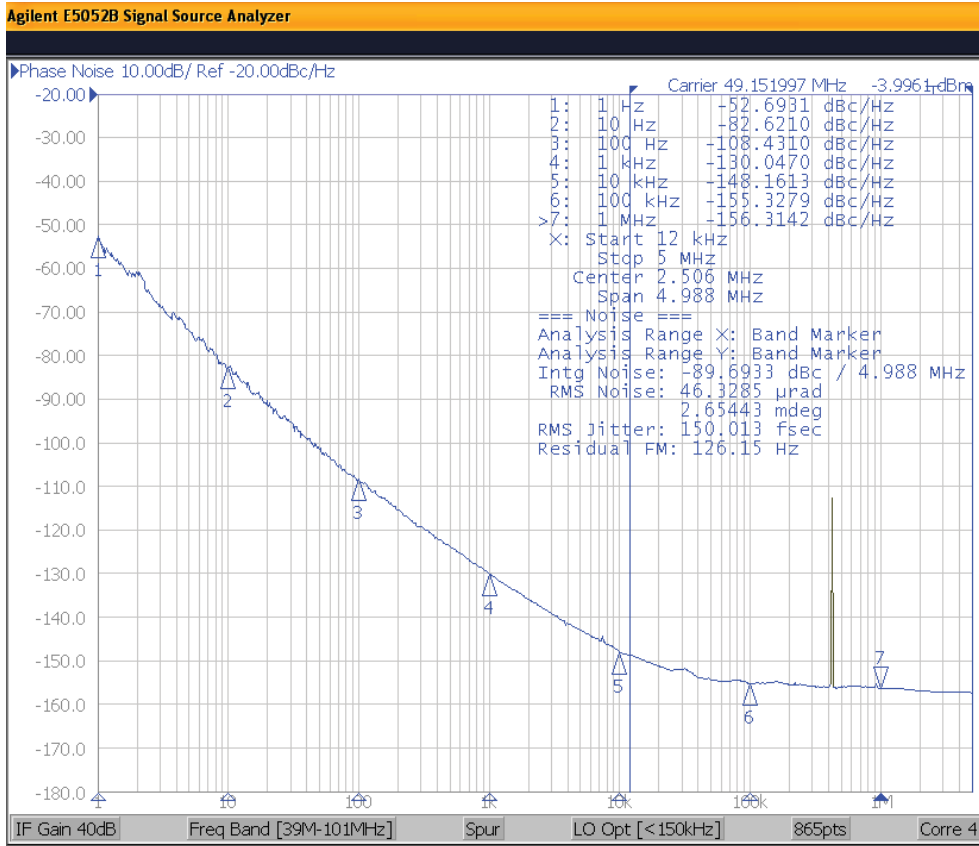


# Specifications

Table 1. Electrical Performance					
Parameter	Symbol	Min.	Typ	Max	Units
Output Frequency	$f_o$		49.152		MHz
Supply Voltage <sup>1</sup>	$V_{DD}$	3.135	3.3	3.465	V
Supply Current	$I_{DD}$			6	mA
Operating Temperature	$T_{OP}$	-40		85	°C
Frequency Stability					
Stability Over $T_{OP}$ <sup>2</sup>	$F_{STAB}$			±0.280	ppm
Initial Accuracy <sup>3</sup>	$F_{TOL}$			±1.5	ppm
Frequency Slope				±0.10	ppm/°C
Power Supply Stability, ±5% change	$F_{SUP}$			±0.10	ppm
Load Stability	$F_{LOAD}$			±0.10	ppm
Holdver Stability at Constant Temperature <sup>4</sup> , 1 day				±0.03	ppm
Holdover Stability <sup>4</sup>				±0.37	ppm
Overall Frequency Stability <sup>6</sup>				±4.6	ppm
RF Output (CMOS)					
Output Level High	$V_{OH}$	0.9* $V_{DD}$			V
Output Level Low	$V_{OL}$			0.1* $V_{DD}$	V
Output Load <sup>7</sup>	$C_L$	13.5	15	16.5	pF
Duty Cycle		45		55	%
Start Up Time	$T_{SUP}$			2	ms
Rise / Fall Times	$t_R / t_F$			5	ns
Output Enable	$V_{IH}$	0.7* $V_{DD}$			V
Output Disable	$V_{IL}$			0.3* $V_{DD}$	V
Phase Noise					
Phase Noise <sup>8</sup> , 49.152MHz					dBc/Hz
10Hz			-81		
100Hz			-107		
1kHz			-129		
10kHz			-147		
100kHz			-155		
Phase Jitter <sup>8</sup> (12k-5MHz)			0.15		ps

1. The VT-803 power supply pin should be filtered, eg, a 0.1 and 0.01uf capacitor
2. (Fmax+Fmin)/2 value over the operating temperature range.
3. Measured at 25 °C.
4. Constant temperature = ± 1 C, after 1 day of power on.
5. Over operating temperature range for 24 hours after 7 days of continuous operation.
6. Includes calibration @ 25 °C, supply voltage, load, reflow, 20 year aging and frequency stability over temperature.
7. The total load on the output in the application should be 15 pF, for best Top stability.
8. Measured using E5052 Signal Source Analyzer.

# Phase Noise



## Package Outline Drawing

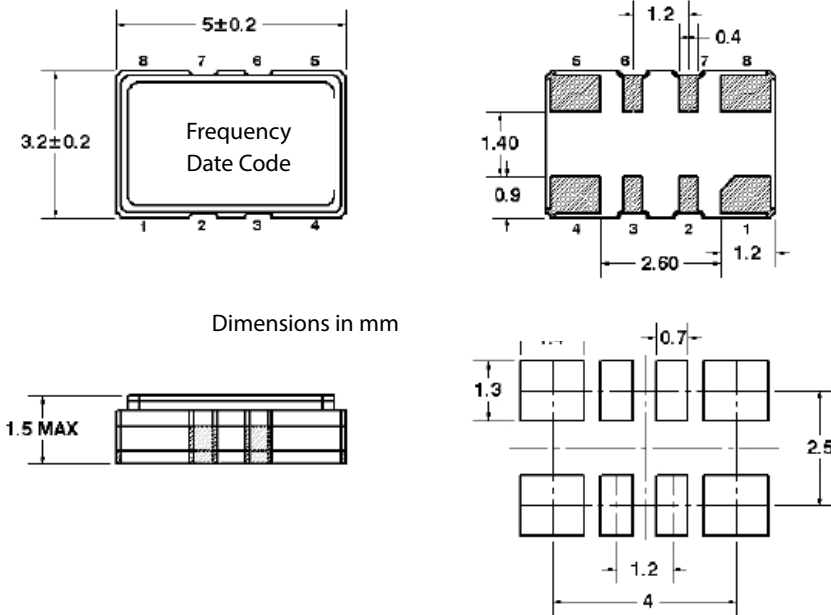


Table 2. Pinout

Pin #	Symbol	Function
1	NC	No Connection
2	NC	Make No Connection
3	NC	Make No Connection
4	GND	Ground
5	OUT	RF Output
6	E/D	Enable / Disable
7	NC	Make No Connection
8	V <sub>DD</sub>	Supply Voltage

Table 3. Enable Disable Function (optional)

Pin 6	Pin 5 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-803, 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.

Parameter	Symbol	Rating	Unit
Storage Temperature	$T_{STORE}$	-55/125	°C
Supply Voltage	$V_{DD}$	-0.6 to 6.0	V
Control Voltage	$V_C$	0/ $V_{DD}$	V
ESD, Human Body Model	HBM	1500	V
ESD, Charged Device Model	CDM	1000	V

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 (0.3-1.0um) over Nickel
Weight	70 mg
ThetaJC (bottom of case)	6 °C/W

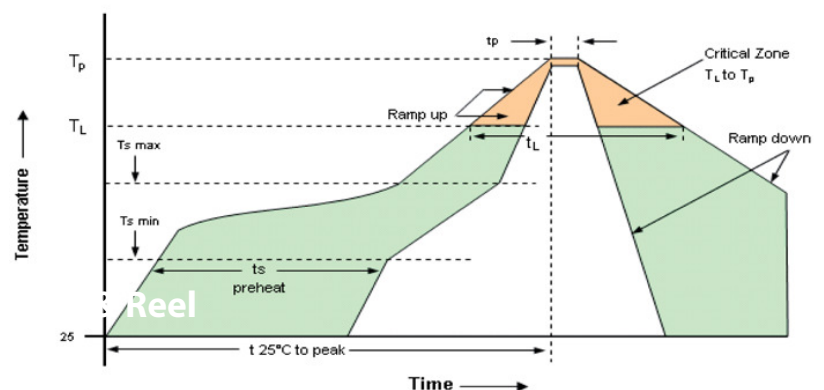
# IR Reflow

## 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.

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

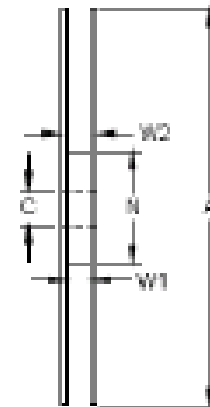
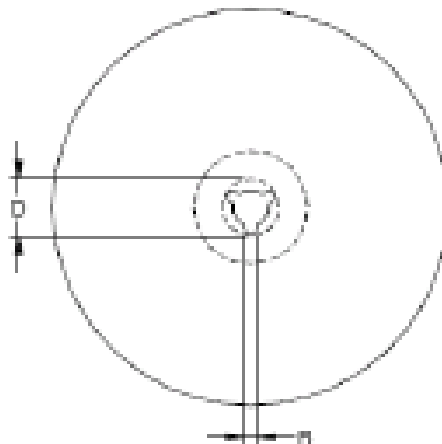
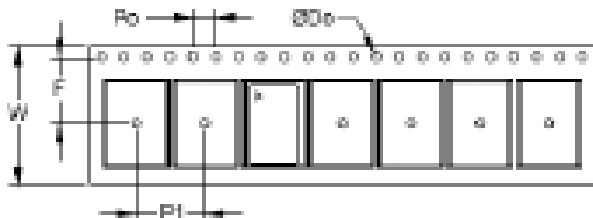
**Solderprofile:**



## Tape & Reel Information

**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	8	254	2.5	13	21	100	13.5	17.5	2000



## Ordering Information

**VT-803- 0053- 49M1520000**

**Product**  
TCXO

**Package**  
5.0x3.2mm Ceramic

**Source Control Drawing**

Frequency in MHz

## Revision History

Revision Date	Approved	Description
Jan 30, 2019	FB	Rev 0.1 - Initial datasheet

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