MX-503

High Precision
Microprocessor Controlled Crystal Oscillator

Features

- Ultra High Stability MCXO
- Low Power Consumption
- Up to 105°C in preparation
- Meets Stratum 3 acc. GR-1244
- ROHS 6 Compliant
- Frequency Range[1]: 8 - 50 MHz
- Standard Frequencies : 10, 12.8, 16.384, 19.2, 20, 22.1184, 24.576, 25, 38.4, 40 MHz
- Uses Vectron's Ultra Smooth Compensation (USC) Algorithm
- Excellent Phase Noise and Allan Deviation

Applications

- 1588 Application
- Test Equipment
- Femto Base Station
- Communication Equipment

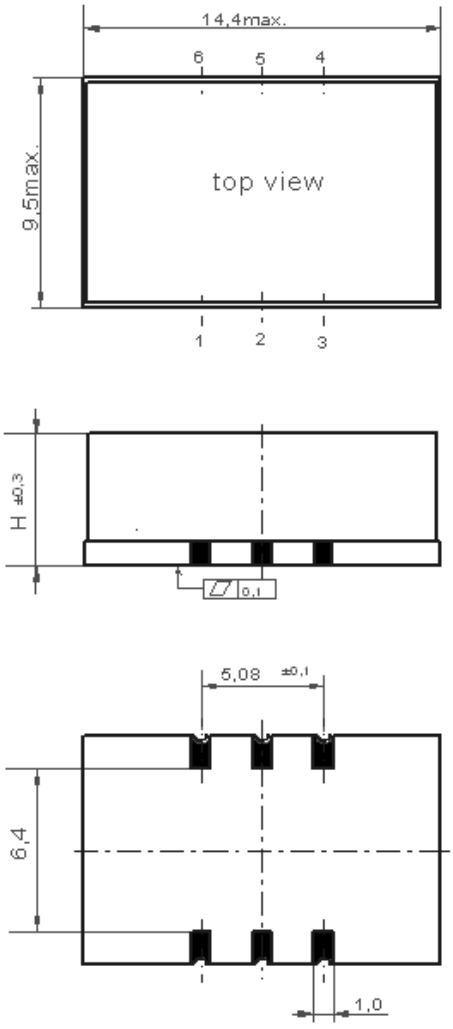
Performance Specifications

Frequency Stabilities[1,3] (Standard - 8 to 26 MHz)						
Parameter	Min	Typical	Max	Units	Condition[2]	
vs. operating temperature range referenced to (dFmax+dFmin)/2	-20 -30 -100		+20 +30 +100	ppb ppb ppb	-20 to +70°C -40 to +85°C -40 to +105°C	Options[3]
In a 24h period at constant temperature	-5		+5	ppb	after 7 days of continous operation	
Frequency vs. temperature slope		±1.0 ±1.5		ppb/°C ppb/°C	-30 to +80°C, 10 & 20MHz -40 to +85°C, 10 & 20MHz	
Initial tolerance vs. supply voltage change vs. load change vs. aging / 1. year vs. aging / 10 years	-0.5 -10 -10 -0.8 -2.5		+0.5 +10 +10 +0.8 +2.5	ppm ppb ppb ppm ppm	 V_S ±5% static Load ±10% static after 30 days of operation after 30 days of operation	

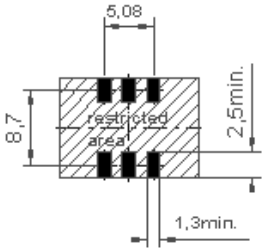
Performance Specifications

Supply Voltage (V_s)						
Parameter	Min	Typical	Max	Units	Condition[2]	
Supply Voltage (standard)	3.135	3.3	3.465	V	8 - 50MHz	
Current Consumption			12	mA		
Supply Voltage (Option)	4,75	5	5.25	V		
Current Consumption			8	mA		
RF Output						
Signal [standard]	HCMOS					
Load		15		pF		
Signal Level (Vol)			0.3	V	Vs = 3.3V	
Signal Level (Voh)	3			V	Vs = 3.3V	
Duty Cycle	45		55	%	@ V_s/2	
Rise and Fall time			5	ns	10 to 90 %	
Frequency Tuning (EFC) 8 to 26 MHz						
Tuning Range	Fixed frequency; No adjust					Option[3]
Tuning Range	±3.5		+10	ppm		
Linearity			2	%	10 & 20MHz	
Tuning Slope	Positive					
Control Input Impedance	20			kOhm		
Control Voltage (V_c) Range	0.0	1.65	3.3	V	@ 3.3V	
	0.5	2.5	4.5	V	@ 5V	
Additional Parameters						
Phase Noise[4]		-65 -93 -118 -140 -154 -156		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 20MHz
ADEV			80	E-12	@ 1sec.	
			80	E-12	@10sec	
Weight			2.0	g		
Processing & Packing	Handling & Processing Note					
Reflow Profile	IPC / JEDEC J-STD-020 (latest version)					
Absolute Maximum Ratings						
Supply Voltage (V_s)	-0.6		6.0	V		
Output Load			50	pF		
Operable Temperature Range	-40		+85	°C		
Storage Temperature Range	-40		+90	°C		
Environmental Conditions						
Rapid Temperature Changes	MIL-883-1010 Cond B 500 cycles -55/125C					
Vibration	MIL-STD-883 Meth 2007 Cond A 20G 20-2000Hz 4x in each 3axis 4 min					
Shock	MIL-STD-202 Meth 213B Cond. F; 1500g 0,5ms 6 shocks in each direction					
Solderability	J_STD_002C Cond A, Through hole device/ Cond. B, SMD 255C (diving time 50,5sec.) Dip+Look with 8h damp pre-treatment: solder wetting >95%					
Solvent Resistance	MIL-STD-883 Meth 2015 Solv. 1,3,4					
ESD	JESD22-A114F Class 1B; 10* 2000V					
Moisture Sensitivity	Level 1 JESD22-A113-B					
RoHS Compliance	100% ROHS 6 Compliant					

Outline Drawing / Enclosure



G 287



Padvorschlag
land pattern
recommendation

Dimensions in mm

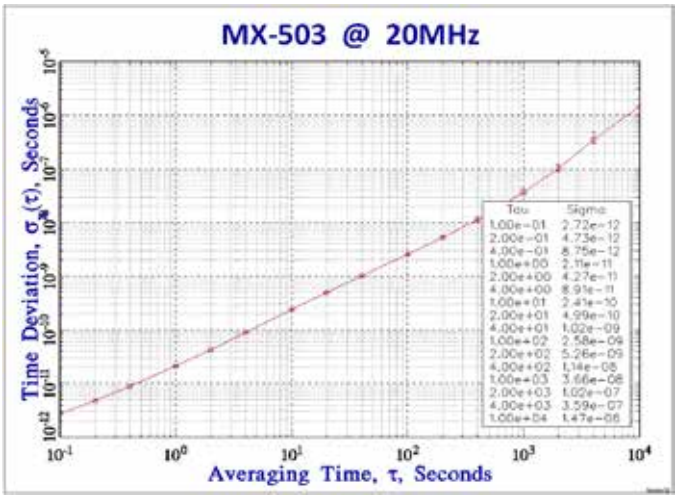
MX-503	
Height "H"	Pin Length "L"
3.8	NA

Pin Connections	
1	Control Voltage Input (Vc) / N.C.
2	Enable / N.C.
3	Ground (Case)
4	RF-Output
5	N.C.
6	Supply Voltage Input (Vs)

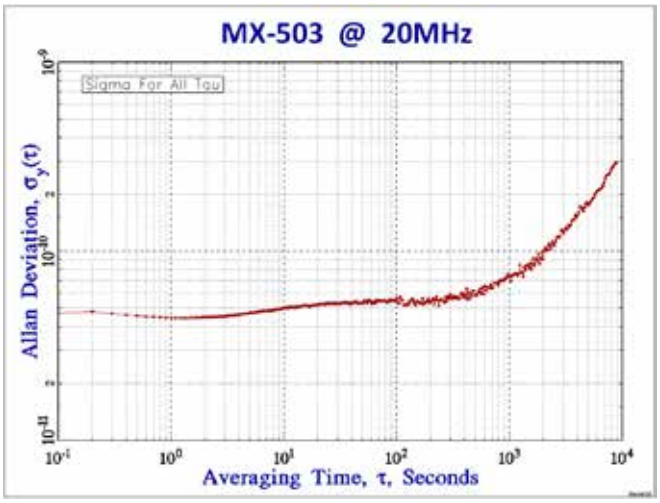
Enable true table (optional): MX-503	
Pin 2	Pin 4
High	Data
Open	Data
Low	High Tristate

Performance Data

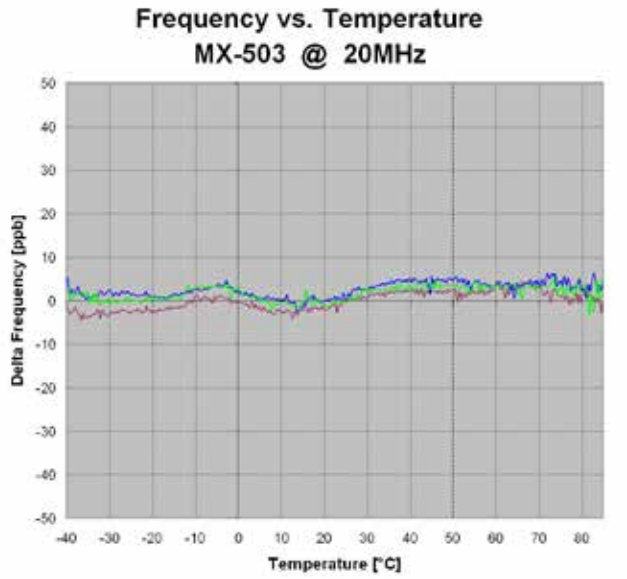
TDEV-without filter



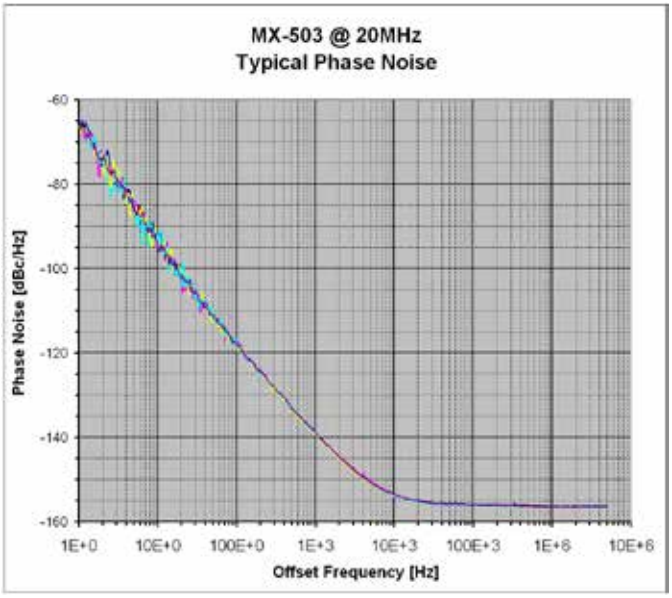
ADEV



Temperature Stability

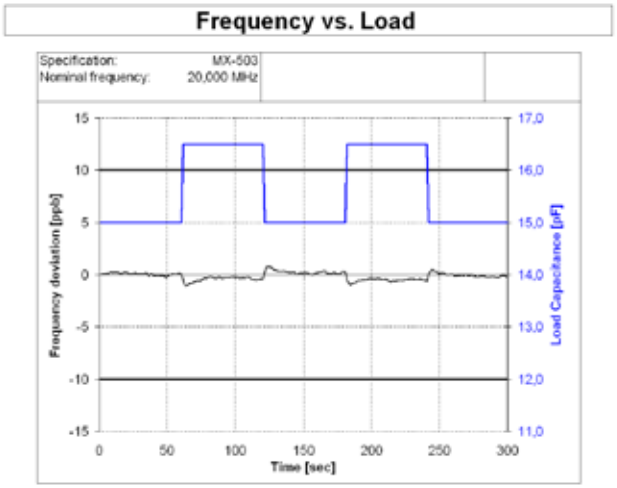


Phase Noise[4]

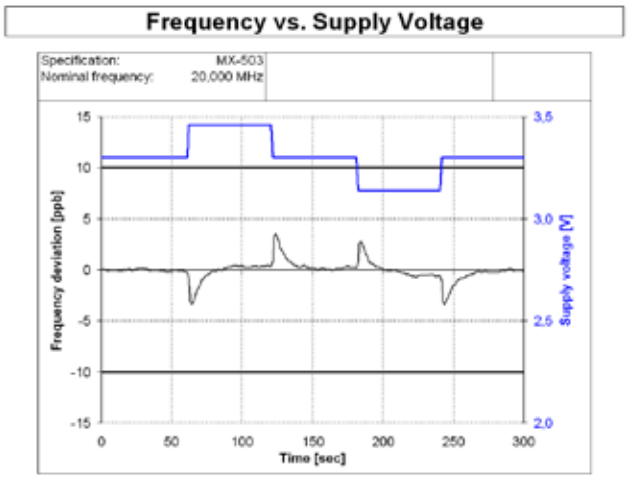


Performance Data

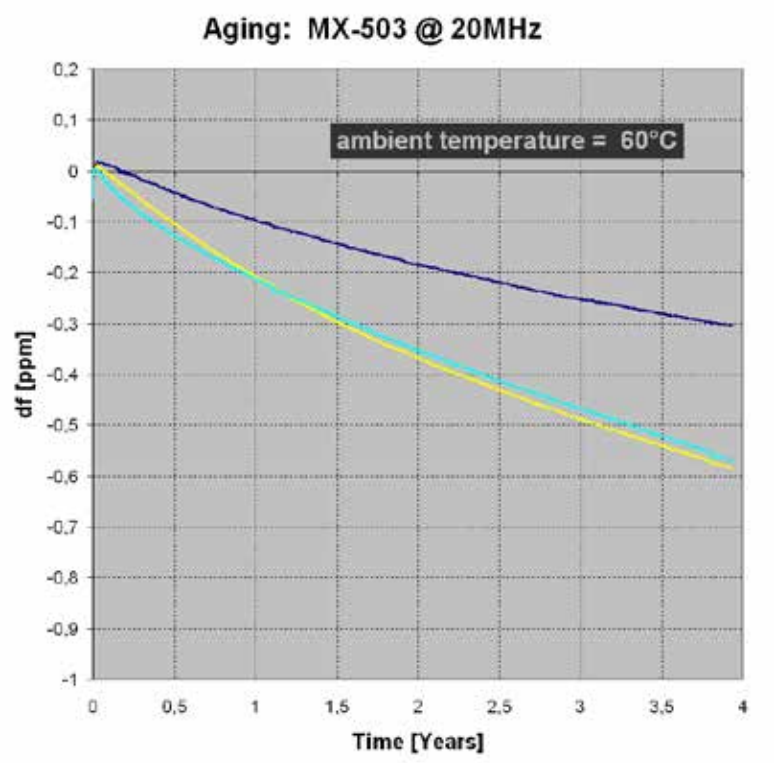
Frequency vs. Load



Frequency vs. Supply Voltage



Aging



Recommended Reflow Profile

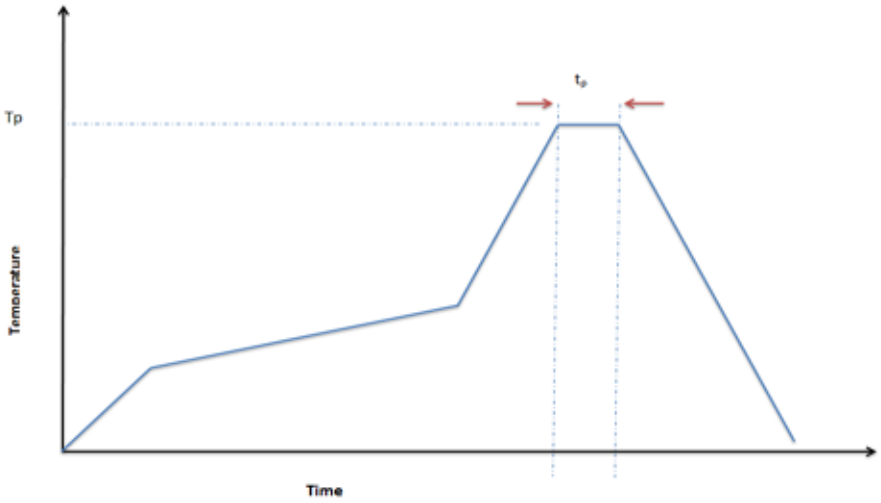
TP: max 250°C (@ solder joint, customer board level)

T_p: max: 10…30 sec

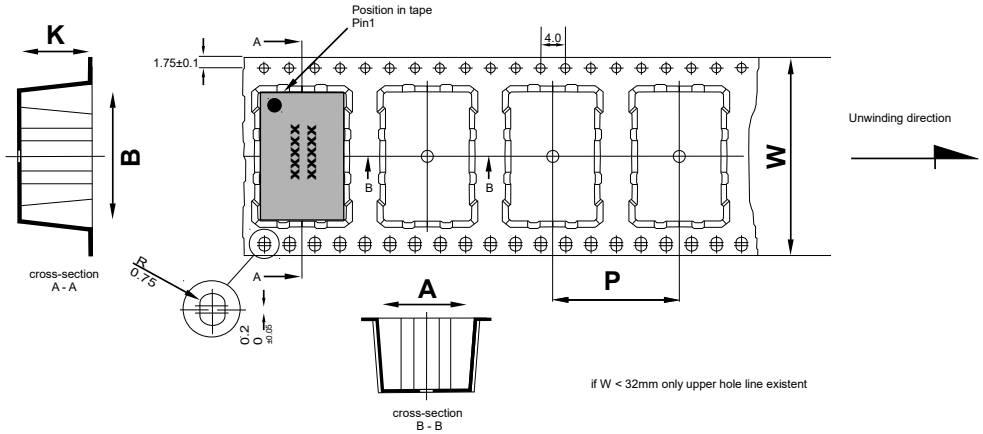
Additional Information:

This SMD oscillator has been designed for pick and place reflow soldering

SMD oscillators must be on the top side of the PCB during the reflow process.



Standard Shipping Method (MX-503)



Dimension in mm:

A, B and K are dependent uppon component dimensions

production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G287	24	83,3	750	16

Ordering Information[1,3]

MX - 503 0 - E A J - 308 0 - 10M0000000

Product Family
MX: MCXO

Package
SMD version: 503

Height
0: 3.8 mm

Supply Voltage
D: 5V
E: 3.3V

RF Output Code
A: HCMOS

Temperature Range
J: -20°C to +70°C
E: -40°C to +85°C
F: -40°C to +105°C [5)]

Stability Code
208: ± 20 ppb
308: ± 30 ppb
107: ±100 ppb

Frequency Control
0: No Tuning
1: ±3.5 ppm
2: Enable
3: ±3.5 ppm; Enable

Frequency

Notes:

1. Contact factory for other frequencies. Not all options and codes are available at all frequencies.
2. Unless otherwise stated conditions are valid at F=20MHz; V_s=3.3V; V_c=1.65; T=25°C; Output Signal=HCMOS; load=15pF
3. Contact factory for availability.
4. Phase noise degrades with increasing output frequency.
5. In preparation with stability code 107

Subject to technical modification.

Contact Information

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