
MX-701

Features

- Ultra High Stability MCXO
- Low Power Consumption
- Extended Temperature Range up to 105°C on request
- ROHS 6 Compliant
- Frequency Range¹: 8 - 40 MHz
- Standard Frequencies : 10, 12.8, 20, 24.576, 25, 32, 40 MHz
- Uses Vectron's Ultra Smooth Compensation (USC) Algorithm
- Excellent Phase Noise and Allan Deviation

Applications

- Military Radios
- Industrial Application
- Test Equipment

Performance Specifications

Frequency Stabilities^{1,3} (Standard - 8 to 25 MHz)

Parameter	Min	Typical	Max	Units	Condition ²
vs. operating temperature range referenced to (dFmax+dFmin)/2	-30		+30	ppb	-40 to +100°C
In a 24h period at constant temperature	-5		+5	ppb	after 7 days of continuous operation
Initial tolerance	-0.5		+0.5	ppm	$V_s \pm 5\%$ static Load $\pm 10\%$ static after 30 days of operation, @ 40°C after 30 days of operation, @ 40°C
vs. supply voltage change	-10		+10	ppb	
vs. load change	-10		+10	ppb	
vs. aging / 1. year	-0.5		+0.5	ppm	
vs. aging / 10 years	-2.5		+2.5	ppm	

Frequency Stabilities^{1,3} (Standard - 26 to 40 MHz)

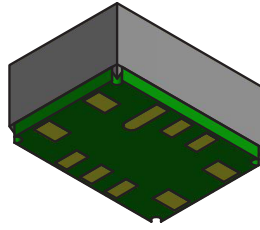
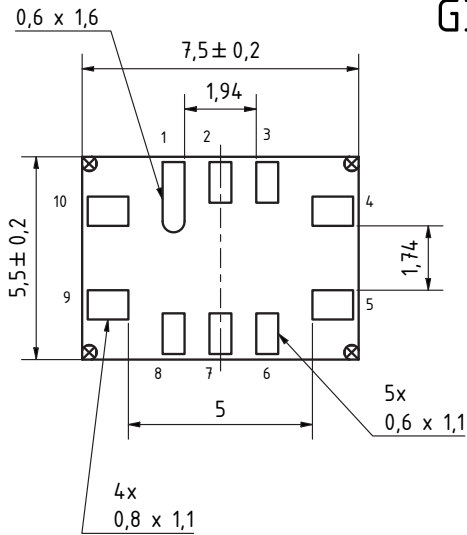
Parameter	Min	Typical	Max	Units	Condition ²
vs. operating temperature range referenced to (dFmax+dFmin)/2	-50		+50	ppb	-40 to +100°C
In a 24h period at constant temperature	-5		+5	ppb	after 7 days of continuous operation
Initial tolerance	-0.5		+0.5	ppm	$V_s \pm 5\%$ static Load $\pm 10\%$ static after 30 days of operation, @ 40°C after 30 days of operation, @ 40°C
vs. supply voltage change	-10		+10	ppb	
vs. load change	-10		+10	ppb	
vs. aging / 1. year	-1		+1	ppm	
vs. aging / 10 years	-3		+3	ppm	

Performance Specifications

Supply Voltage (V _s)					
Parameter	Min	Typical	Max	Units	Condition ²
Supply Voltage (standard)	3.135	3.3	3.465	V	8 - 40MHz
Current Consumption			12	mA	
RF Output					
Signal [standard]	HCMOS				
Load		15		pF	
Signal Level (Vol)			0.3	V	V _s = 3.3V
Signal Level (Voh)	3			V	V _s = 3.3V
Duty Cycle	45		55	%	@ V _s /2
Rise and Fall time			5	ns	10 to 90 %
Frequency Tuning (EFC) 8 to 40 MHz					
Tuning Range	Fixed frequency; No adjust				Option ³
Tuning Range	±3.0		±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	
Additional Parameters at 10MHz					
Phase Noise ⁴		-70 -100 -123 -142 -154 -157		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz 100 kHz
ADEV			80	E-12	@ 1sec.
			80	E-12	@10sec.
Weight			1.0	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	
Operable Temperature Range	-40		+105	°C	
Storage Temperature Range	-40		+125	°C	
Environmental Conditions					
Temperature Cycling	JESD22-A104-D Cond.G - 500cycles -40/+125°C;cycle time 30min				
Vibration	MIL-STD-883 Meth 2007 Cond A 20G 20-2000Hz 4x in each 3axis 4 min				
Random Vibration	MIL-STD-202G Figure 214-1 Cond.G - 3hrs@23,91Grms/axis 3 ortogonal/continuous/operating				
Mechanical Shock	MIL-STD-883G Meth 2002.4 Cond. C - 3000g 0,3ms 5 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%				
Reflow Simulation Test	MIL-STD-202G Meth 210F Cond. K - Total 3x Lead free profile (for SMD)				
ESD HBM	JESD22-A114F Class 1B; 10* 2000V				
Moisture Sensitivity	JESD22-A113-B, MSL1				
ROHS Compliance	100% ROHS Compliant				
Humidity Bias Life Test	JESD22-A101-C - 85°C/85% RH 1008h				
High Temperature Operating Life (HTOL)	JESD22-A-108-B, 1000h @ 125°C power on				

Outline Drawing / Enclosure

G374



MX-701

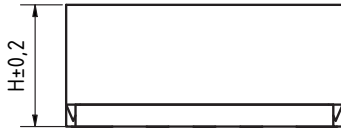
Height "H"

3.3

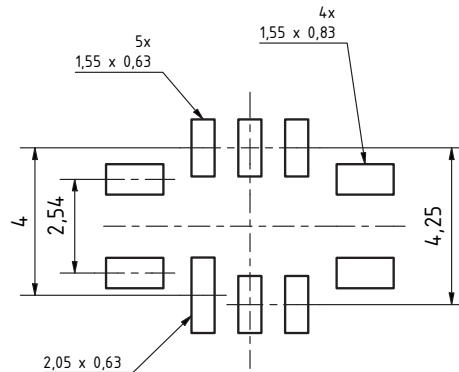
Pin Connections

1	I.C. (Intern connected, do not connect)
2	I.C. (Intern connected, do not connect)
3	I.C. (Intern connected, do not connect)
4	GND Ground
5	RF-Output
6	I.C. (Intern connected, do not connect)
7	I.C. (Intern connected, do not connect)
8	I.C. (Intern connected, do not connect)
9	Vs Supply Voltage
10	Vc Control Voltage Input / N.C.

recommended pad layout
top view

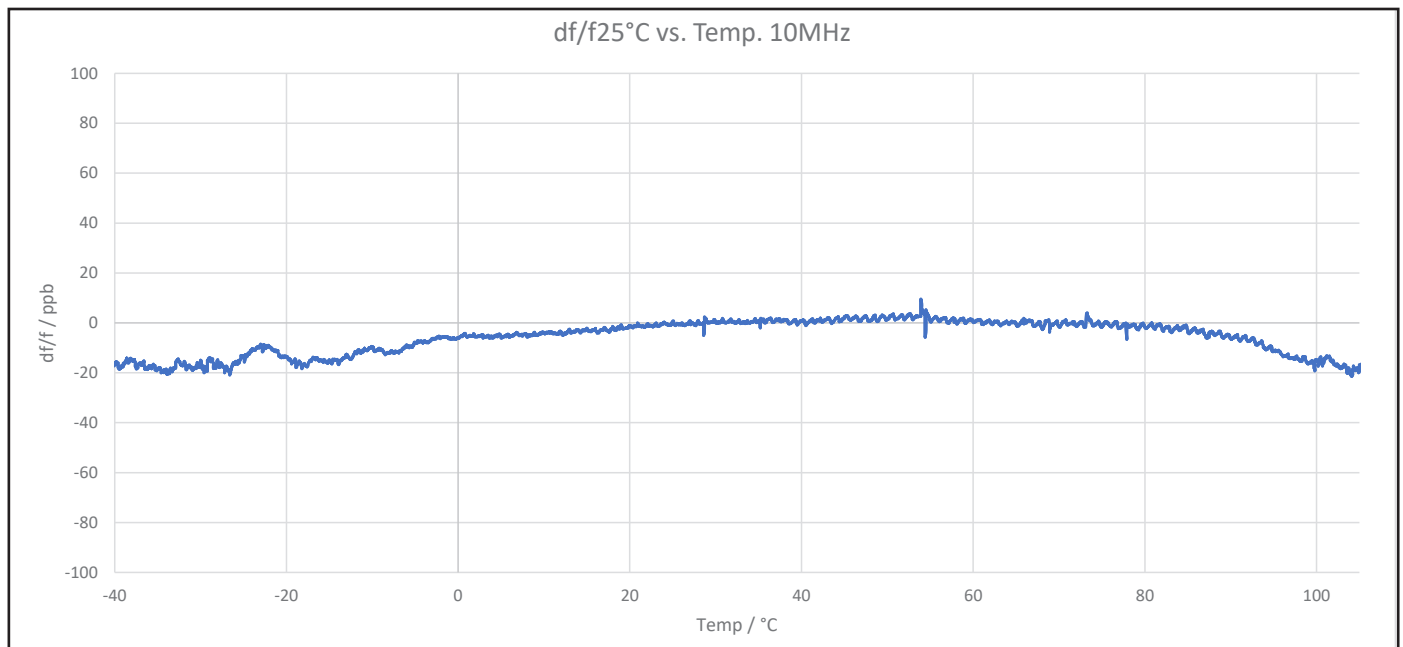


Dimensions in mm



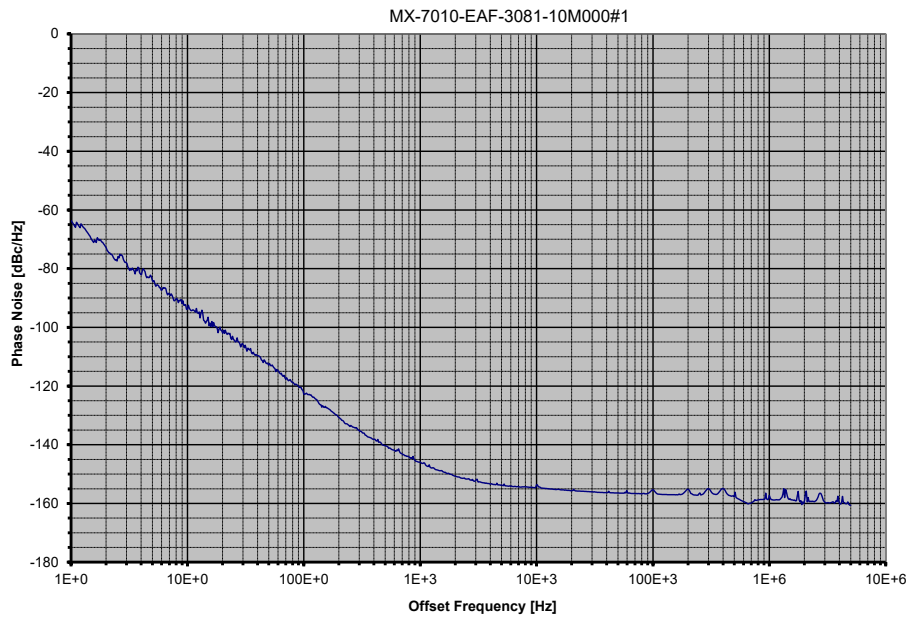
Performance Data

Temperature stability



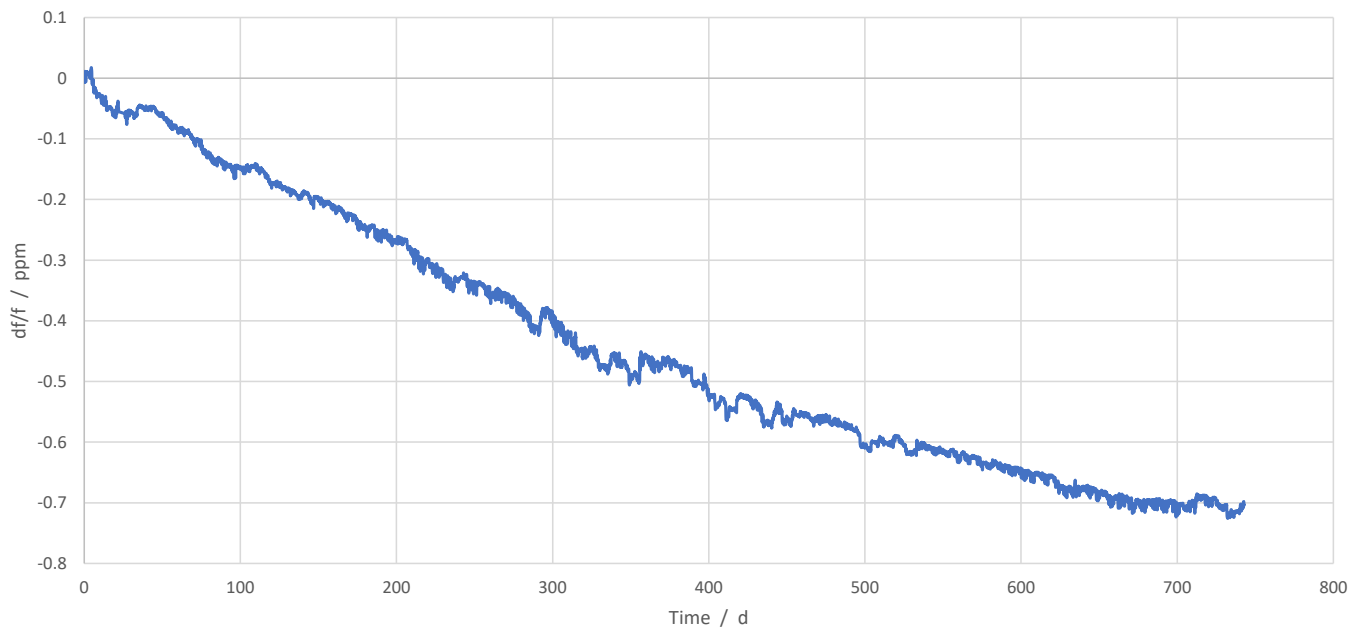
Performance Data

Phase Noise⁴



Aging

Aging MX-7010-EAF-3081-10M0000000 @85°C



Recommended Reflow Profile

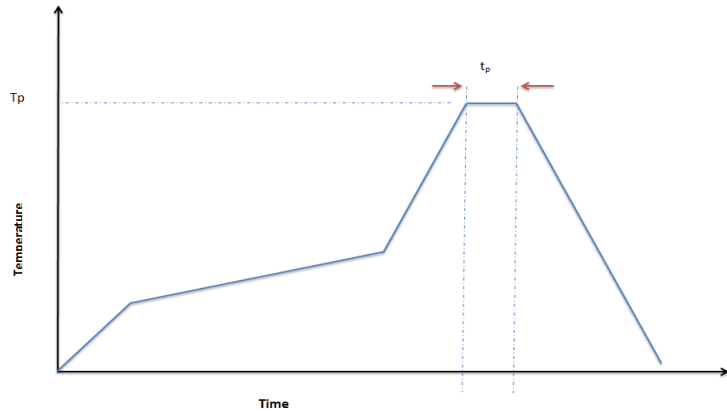
TP: max 250°C (@ solder joint, customer board level)

T_p: max: 10...30 sec

Additional Information:

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

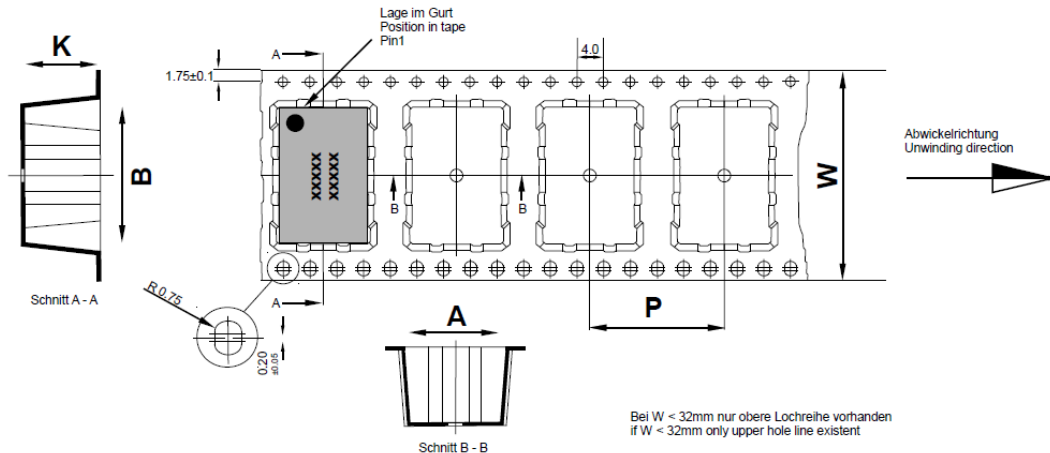
SMD oscillators must be on the top side of the PCB during the reflow process.



Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate (T _L to T _p)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min T _{Smin} -Temperature Min T _{Smax} -Time (min to max) t _s	150°C 200°C 60-180 seconds	Time maintained above -Temperature (T _L) -Time (t _L)	217°C 60-150 seconds
T _{Smax} to T _L -Ramp-up Rate	3°C/second max		
Time maintained above -Temperature (T _L) -Time (t _L)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (t _p)	20-40 seconds
Peak Temperature (T _p)	max 260°C	Ramp-down Rate	6°C/ second max

Note: All temperatures refer to topside of the package, measured on the package body surface.
SMD oscillators must be on the top side of the PCB during the reflow process.

Standard Shipping Method (MX-701)

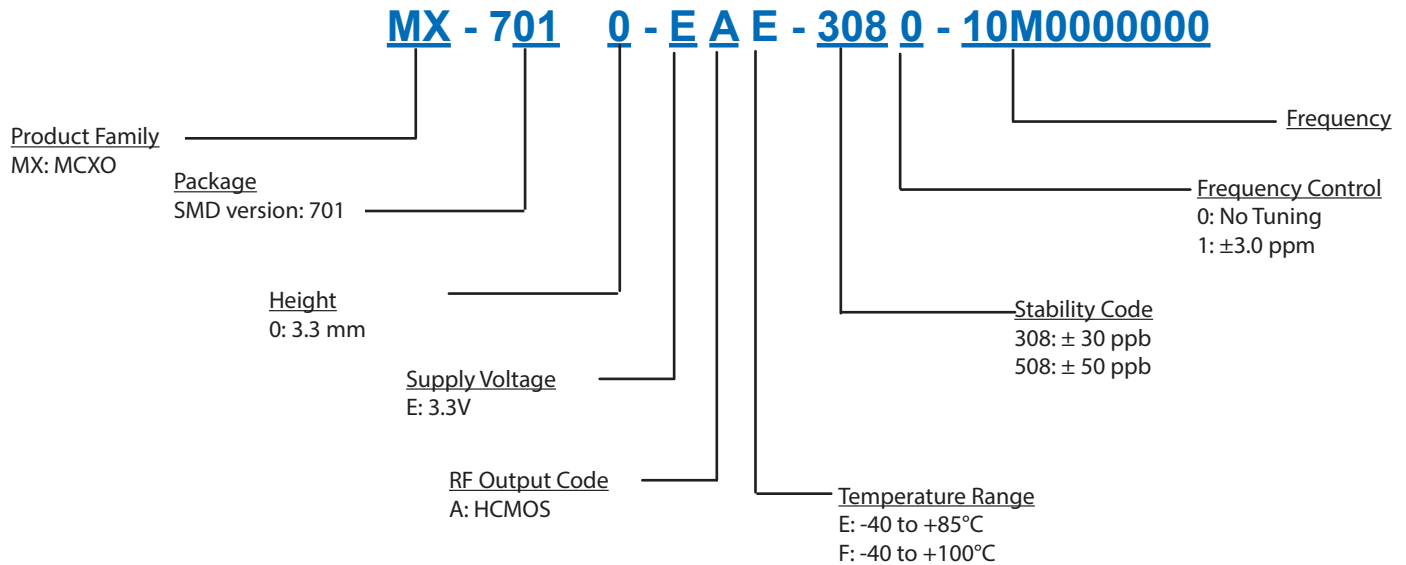


Maßangaben in mm:	Dimension in mm:
A, B und K Maße von Bauelement abhängig	A, B und K are dependent upon component dimensions
Fertigungstoleranzen entsprechen der DIN IEC 286-3	production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G374	24	83,3	250	12

Ordering Information^{1,3}



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.

Subject to technical modification.



Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATION OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING, BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly, or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip and Vectron names and logos are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.