

## Helping Customers Innovate, Improve & Grow



### Features

- SC-Cut resonator
- Frequency Range: 5 MHz to 20 MHz
- Low Package Height
- Temperature stability to 0.4 ppb
- Aging rate 0.1 ppb/day
- Frequency range 5 to 20 MHz
- Standard frequencies: 5, 10, 20 MHz

### Applications

- CDMA2000, WiMax, LTE and UMTS Base Stations
- Test and Measurement Equipment
- Broadcast Reference Standard

## Performance Specifications

Frequency Stabilities <sup>1</sup>					
(Stabilities listed for 10 MHz. For stabilities above 10 MHz values may degrade. Please contact factory)					
Parameter	Min	Typ	Max	Units	Condition
vs. operating temperature range (referenced to +25°C)	-0.2		+0.2	ppb	0... +70°C
	-0.4		+0.4	ppb	-20... +70°C
	-0.6		+0.6	ppb	-40... +85°C (+5V version)
For better stability refer to the MX-042 datasheet.					
Initial Tolerance	-50		+50	ppb	at time of shipment, nominal EFC
vs. supply voltage change	-0.1		+0.1	ppb	VS ± 5%
vs. load change	-0.1		+0.1	ppb	Load ± 5%
vs aging/ day	-1		+1	ppb	after 24 hours of operation
vs aging/ day	-0.1		+0.1	ppb	after 72 hours of operation
vs. aging / 1 year	-20		+20	ppb	after 72 hours of operation
vs. aging / year (following years)	-10		+10	ppb	
vs. aging/ 10 years	-75		+75	ppb	after 72 hours of operation
Retrace <sup>2</sup>	-10		+10	ppb	
Warm-up Time			5	minutes	to ± 10 ppb of final frequency (1 hour) @25°C
Supply Voltage (Vs)					
Supply voltage (Standard)	4.75	5.0	5.25	VDC	
Supply voltage (Option)	11.4	12.0	12.6	VDC	

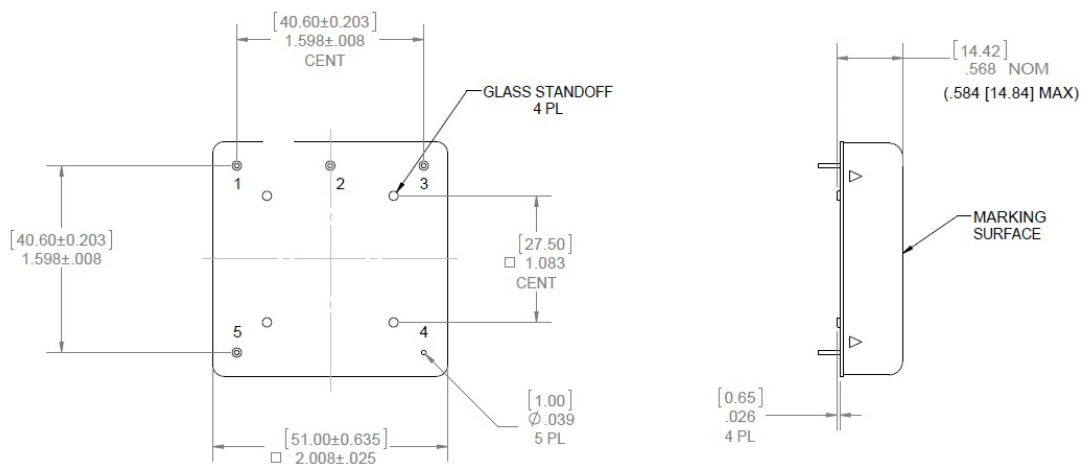
## Performance Specifications

Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Units	Condition
Supply Voltage	4.75	5.0	5.25	VDC	Ordering code D
	11.4	12.0	12.6	VDC	Ordering code B, temp stability T and J only
Power Consumption Reference Voltage (Vref) - when specified for custom units.			4.5	Watts	during warm-up, all temperatures
			2.0	Watts	steady state @ +25°C
		4.25		Watts	steady state @ -40°C
		1.0		Watts	steady state @ +85°C
RF Output					
Start Time		1	2	s	time required to achieve 90% of amplitude
Signal [standard]	HCMOS				
Load		15		pF	
Signal Level (Vol)			0.5	VDC	
Signal Level (Voh)	3.5			VDC	
Duty Cycle	45		55	%	@ (Voh-Vol)/2
Signal	Sine Wave				
Load		50		Ω	
Output Power @ 5.0V,12 V	+5	+7	+9	dBm	
Harmonics			-40	dBc	
Subharmonics			-40	dBc	frequencies >= 10 MHz
Frequency Tuning (EFC)					
Tuning range	±150		±250	ppb	(fixed frequency option available)
Linearity		5		%	
Tuning Slope	Positive				
Input Impedance		100		kOhm	
Bandwidth Modulation	150			Hz	
Control Voltage Range	0.0	2.5	5	VDC	with Vs=12.0V
	0	2	4	VDC	with Vs=5.0V
Reference Voltage Output (Vref)					
the MX-041 can be configured with a reference voltage on pin 2. This configuration requires a custom part number. Please contact the factory for ordering information.					
Reference Voltage (Vref) - when specified for custom units.	3.92	4.0	4.08	VDC	with Vs = 5.0 VDC
	4.9	5	5.1	VDC	with Vs =12 VDC

Additional Parameters						
Parameter	Min	Typical	Max	Units	Condition	
Phase noise <sup>3</sup>			-95	dBc/Hz	1 Hz	@ 10MHz
			-125	dBc/Hz	10 Hz	
			-140	dBc/Hz	100 Hz	
			-145	dBc/Hz	1 kHz	
			-145	dBc/Hz	10 kHz	
For lower phase noise, please review the OX-174 or OX-204 datasheet.						
Allan Deviation			3e-12		1 s tau	@ 10MHz
			5e-12		10 s tau	
			1e-11		100 s tau	
			5e-11		1000 s tau	
For oscillators with lower ADEV requirements. Please review the OX-174 datasheet. For oscillators with TDEV and MTIE requirements. Please review the OX-172 datasheet.						
g-sensitivity				1	ppb/g	
g-sensitivity of 0.5 ppb/g available in this package size. Please contact factory for ordering information. For g-sensitivity <0.5 ppb/g, please review the OX-043 series.						
Weight			55	g		
Absolute Maximum Ratings						
			15.0	VDC		
Output load	25		50 open	pF Ohms	CMOS Sine	
Operable temperature range	-55		+95	°C	Operable temperature range implies the device will continue to operate with no long-term damage to unit; however, it will not be specification compliant outside the operating temperature range.	
Environmental and Product Classification						
Shock (Endurance)	MIL-STD-202, Method 213, Condition J, 30g 11 ms					
Sine Vibration (Endurance)	MIL-STD-202, Method 201 and 204, Condition A, except 5g to 500 Hz, 1 sweep each axis					
Random Vibration (Endurance)	MIL-STD-202, Method 214, Condition I-D					
Humidity	MIL-STD-202, Method 103, Condition B, 100% rh					
Seal	MIL-STD-202, Method 112, Condition D, hermetic, washable					
Altitude	MIL-STD-202, Method 105, sea level to space					
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition A,B,C					
Terminal Strength	MIL-STD-202, Method 211, Condition C (5 bends at 45°, 2 lbs)					
Moisture Sensitive Level	1					
RoHS	6 (fully compliant)					
Storage Temperature Range	-55		+125	°C		

## Outline Drawing / Enclosure

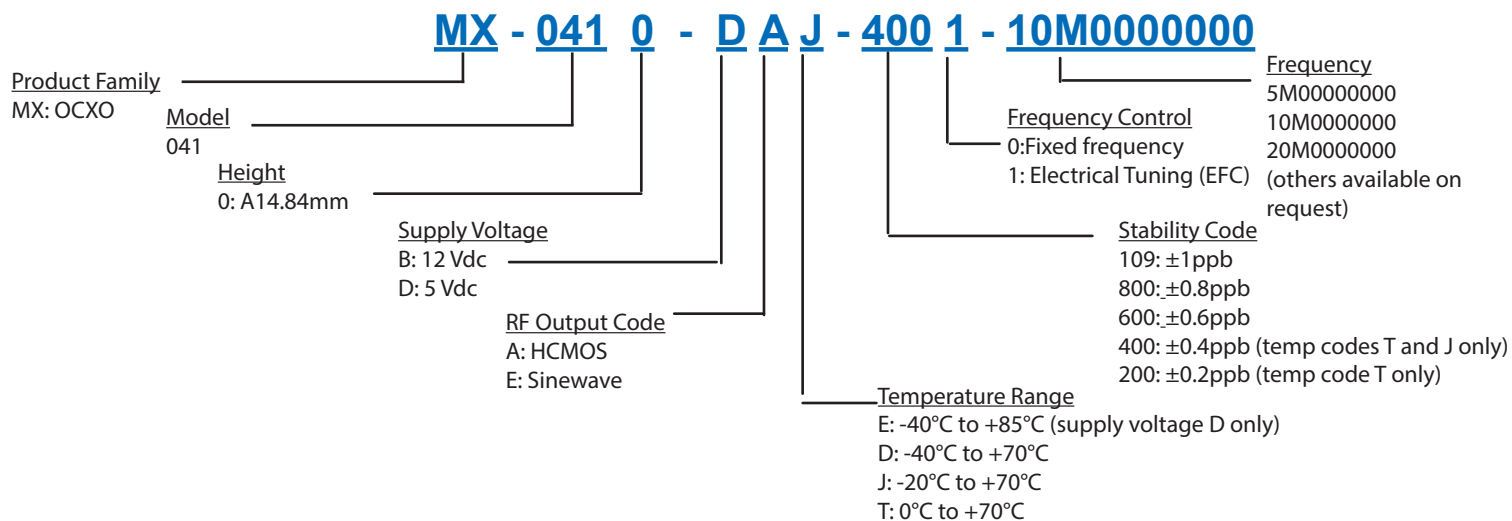
Dimensions in inches, [ ] in mm.



Type A		
Code	Height "H"	Pin Length "L"
0	14.84	7.5

Pin Connections	
1	Electronic Frequency Control (EFC)
2	N/C Optional Reference Voltage
3	RF Output
4	Ground (Case)
5	Supply Voltage Input (Vs)

## Ordering Information



**Stability code - Temperature and Frequency Options**

Frequency	0 to +70 °C	-20 to +70 °C	-40 to +70°C	-40 to +85°C (supply voltage D only)
5 to 10 MHz	200	400	600	600
> 10 MHz	400	600	800	109

## Additional Ordering Options

Additional ordering options available include custom heights, custom aging rates, custom temperature ranges, custom temperature stabilities, custom phase noise requirements, improved g-sensitivity, and oscillators with voltage reference output on pin 2. These modifications require a custom dash number - please contact the factory for additional information.

## Design Tools

Vectron stocks the following items for small orders and prototype development:
MX-0410-DEJ-2001-10M0000000
Vectron stocks the following evaluation board for this product:
OCXO Evaluation Board
Application Notes:
None

### Notes:

1. Unless otherwise stated, all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, and temperature (25°C).
2. Retrace defined as  $f_1 - f_0$  where  $f_0$  is the reading after the unit has been on power for 24 hours, and  $f_1$  is the frequency after 24 hours off followed by 60 minutes on.
3. Phase noise degrades with increasing output frequency.
4. Not all options and codes available at all frequencies.

## For Additional Information, Please Contact

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