



MV200M

Oven Controlled Crystal Oscillator
10-40 MHz

Revised 1/30/17

Your dedicated source for crystal oscillators and filters.

Features

- Digital Frequency Control
- High Stability vs. Temperature: up to $\pm 2 \times 10^{-10}$
- Low Package Height: 12.7 mm to 10 mm
- Long Term Stability: up to $\pm 1 \times 10^{-8}$ /year
- +5V & +12V

Applications

- SatCom
- Test equipment
- Network clock
- Base station

Specifications

Temperature Range	Temperature Stability Availability		Comments
	High	Higher*	
0 to +55° C	$< \pm 2 \times 10^{-9}$	$< \pm 1 \times 10^{-10}$	
-10 to +60° C	$< \pm 2 \times 10^{-9}$	$< \pm 1 \times 10^{-10}$	
-20 to +70° C	$< \pm 2 \times 10^{-9}$	$< \pm 1 \times 10^{-10}$	
-40 to +70° C	$< \pm 2 \times 10^{-9}$	$< \pm 1 \times 10^{-10}$	
-40 to +85° C	$< \pm 2 \times 10^{-9}$	$< \pm 5 \times 10^{-10}$	Contact factory for $< \pm 2 \times 10^{-10}$

*For 12.7 mm height. Contact factory and see ordering designations at the end of this data sheet.

Standard Frequencies	Long Term Stability (Yearly Aging) Availability		Comments
	High	Higher	
10 MHz	$< \pm 1 \times 10^{-7}$	$< \pm 2 \times 10^{-8}$	
12.8 MHz	$< \pm 1 \times 10^{-7}$	$< \pm 2 \times 10^{-8}$	
13.0 MHz	$< \pm 1 \times 10^{-7}$	$< \pm 5 \times 10^{-8}$	Contact factory for $< \pm 3 \times 10^{-8}$
16.384 MHz	$< \pm 2 \times 10^{-7}$	$< \pm 1 \times 10^{-7}$	Contact factory for $< \pm 5 \times 10^{-8}$
20 MHz	$< \pm 2 \times 10^{-7}$	C	Contact factory for $< \pm 1 \times 10^{-7}$

Contact factory for non-standard long term stability performance and see ordering designations at the end of this data sheet.

Specification	Short Term, Pulling & Pushing Stability			Comments
	Standard	Option	Option*	
Short term stability per 1 sec.	$< \pm 5 \times 10^{-12}$	$< \pm 1 \times 10^{-12}$	$< \pm 5 \times 10^{-13}$	Allan deviation, For 10 MHz
Stability vs. Load ($\pm 5\%$)	$< \pm 5 \times 10^{-10}$	$< \pm 2 \times 10^{-10}$		
Stability vs. power supply ($\pm 5\%$)	$< \pm 5 \times 10^{-10}$	$< \pm 2 \times 10^{-10}$		
Warm-up time to w/ in $< \pm 2 \times 10^{-8}$	<3 minutes			@25° C

Specifications-Continued

Freq Offset	Phase Noise, 10 MHz, Sinewave (dBc/Hz)							Comments
	STD	LN	ILN*	ULN* ¹	F*	LNF*	ULNF*	
1 Hz	< -95	< -100	< -103	< -108	< -90	< -90	< -100	
10 Hz	< -125	< -130	< -133	< -137	< -120	< -120	< -133	
100 Hz	< -145	< -153	< -155	< -157	< -150	< -150	< -158	
1 kHz	< -150	< -158	< -160	< -161	< -162	< -163	< -163	
10 kHz	< -155	< -160	< -161	< -162	< -165	< -168	< -168	

Contact factory for lower phase noise performance and see ordering designations at the end of this data sheet.

* 12 Volt

1: for $\pm 5 \times 10^{-10}$ temperature stability

Output	Output Parameters	
	HCMOS	Sinewave
Level	"0"	< 0.5V
	"1"	> 4.0V
Load	10K Ohms, 30 pF	50 Ohms \pm 5%
Rise/Fall Time	< 6 nS (<3 nS Optional)	-
Harmonics	-	> -30 dBc (>-50 dBc Optional)

See ordering designations at the end of this data sheet.

Power Supply & Voltage Control Parameters

Specification	12V \pm 5%	5V \pm 5%
Steady state current @ 25° C	< 250 mA	< 500 mA
Peak warm-up current @ -40° C	< 550 mA	< 1200 mA
Frequency Adjust range	> $\pm 4 \times 10^{-7}$	
Frequency Adjust Voltage (Uin) or with Potentiometer	0 to +5V	0 to +4.5V 20 kOhm
Reference Voltage (Uref)	+5V	+4.5V

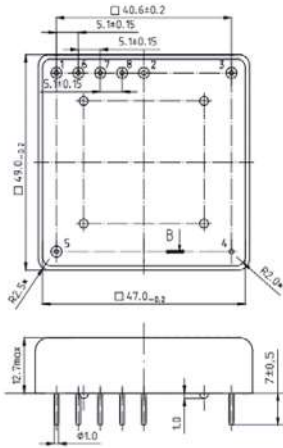
See ordering designations at the end of this data sheet.

Environmental Parameters

Specification	Conditions
Vibration Frequency	10-500 Hz
Vibration Acceleration	5 gs
Shock Acceleration	75 gs
Shock Duration	3 \pm 1 mS
Humidity	-
Storage Temperature	-55 to +85° C
RoHs	Option

Contact factory for extended environmental conditions.

Outline Drawing

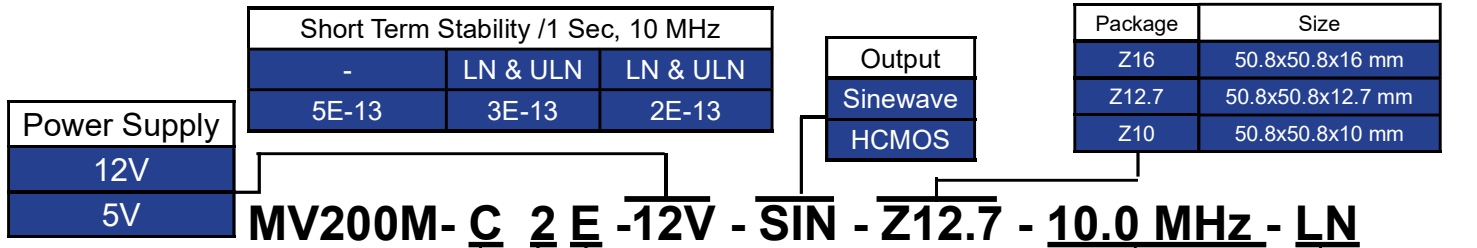


H = 12,7 mm for Z12,7;
H = 10 mm for Z10.

Digital frequency Control	
Pin	Designation
1	CS
2	Uref
3	RF Out
4	Ground
5	Us
6	N/C
7	SDIN
8	SCLK

Analog frequency Control	
Pin	Designation
1	Uin
2	Uref
3	RF Out
4	Ground
5	Us
6	N/C
7	N/C
8	N/C

Ordering Guide



Availability of certain stability vs. operating temperature range.		$\pm 2 \times 10^{-9}$	$\pm 1 \times 10^{-9}$	$\pm 5 \times 10^{-10}$	$\pm 2 \times 10^{-10}$
		2	1	05	02
A	0 to +55° C	A	A	A	A
B	-10 to +60° C	A	A	A	A
C	-20 to +70° C	A	A	A	A
D	-40 to +70° C	A	A	A	C
EX	-40 to +85° C	A	A	A	C

A=Available, C=Contact factory, N=Not available

Availability of certain aging values for certain frequencies.		Standard Frequencies				
		10.0 MHz	12.8 MHz	13.0 MHz	16.384 MHz	20.0 MHz
H	$\pm 2 \times 10^{-7}$ /year	A	A	A	A	A
G	$\pm 1 \times 10^{-7}$ /year	A	A	A	A	C
F	$\pm 5 \times 10^{-8}$ /year	A	A	A	C	NA
E	$\pm 3 \times 10^{-8}$ /year	A	A	C	NA	NA
D	$\pm 2 \times 10^{-8}$ /year	A	C	NA	NA	NA
C	$\pm 1 \times 10^{-8}$ /year	A	C	NA	NA	NA

A=Available, C=Contact factory, NA=Not available

Phase Noise, 10 MHz, Sinewave (dBc/Hz)								
Freq Offset	STD	LN	ILN*	ULN* ¹	F*	LNF*	ULNF*	Comments
1 Hz	< -95	< -100	< -103	< -108	< -90	< -90	< -100	* 12 Volt
10 Hz	< -125	< -130	< -133	< -137	< -120	< -120	< -133	¹ $\pm 5 \times 10^{-10}$ temp stability
100 Hz	< -145	< -153	< -155	< -157	< -150	< -150	< -158	
1 kHz	< -150	< -158	< -160	< -161	< -162	< -163	< -163	
10 kHz	< -155	< -160	< -161	< -162	< -165	< -168	< -168	