



# MV200

Oven Controlled Crystal Oscillator  
10-40 MHz

Revised 1/30/17

Your dedicated source for crystal oscillators and filters.

## Features

- High Stability vs. Temperature: up to  $\pm 5 \times 10^{-11}$
- Low Package Height: 10 mm to 16 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	$< \pm 5 \times 10^{-9}$	$< \pm 5 \times 10^{-11}$	
-10 to +60° C	$< \pm 5 \times 10^{-9}$	$< \pm 1 \times 10^{-10}$	
-20 to +70° C	$< \pm 5 \times 10^{-9}$	$< \pm 2 \times 10^{-10}$	Contact factory for $< \pm 1 \times 10^{-10}$
-40 to +70° C	$< \pm 5 \times 10^{-9}$	$< \pm 5 \times 10^{-10}$	Contact factory for $< \pm 2 \times 10^{-10}$
-40 to +85° C	$< \pm 5 \times 10^{-9}$	$< \pm 5 \times 10^{-10}$	Contact factory for $< \pm 2 \times 10^{-10}$

Temperature ranges from -60° C to +85° C available. 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	$< \pm 1 \times 10^{-7}$	$< \pm 1 \times 10^{-8}$	
12.8 MHz	$< \pm 1 \times 10^{-7}$	$< \pm 3 \times 10^{-8}$	Contact factory for $< \pm 2 \times 10^{-8}$
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.	$< \pm 5 \times 10^{-12}$	$< \pm 1 \times 10^{-12}$	$< \pm 6 \times 10^{-13}$	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

\* for  $< \pm 5 \times 10^{-10}$  Temperature Stability

## Specifications-Continued

Frequency Offset	Phase Noise, 10 MHz, 12V, Sinewave (dBc/Hz)				Comments
	STD	LN	IL	UL	
1 Hz	< -95	< -100	< -103	< -108	Contact factory for lower phase noise
10 Hz	< -125	< -130	< -133	< -137	
100 Hz	< -145	< -153	< -155	< -157	
1 kHz	< -150	< -158	< -160	< -161	
10 kHz	< -155	< -160	< -161	< -162	

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

Output	Output Parameters		Sinewave
	HCMOS		
Level	"0"	< 0.5V	> 300 mV
	"1"	> 4.0V	+9±1 dBm Optional for +12V
Load	10K Ohms, 30 pF		50 Ohms ± 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.

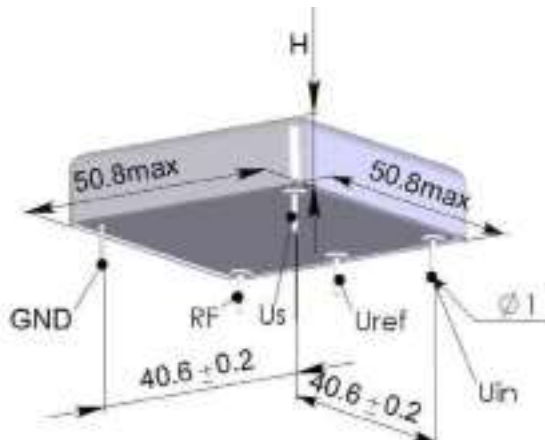
Specification	Power Supply & Voltage Control Parameters	
	12V ±5%	5V ±5%
Steady state current @ 25° C	< 250 mA	< 500 mA
Peak warm-up current @ -40° C	< 550 mA	< 1200 mA
Frequency Adjust range	>±4x10 <sup>-7</sup>	
Frequency Adjust Voltage (Uin) or with Potentiometer	0 to +5V	0 to +4.5V
Reference Voltage (Uref)	+5V	+4.5V

See ordering designations at the end of this data sheet.

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

Contact factory for extended environmental conditions.

## Outline Drawing



H=19 mm for Z19; H=16 mm for Z16;  
H=12.7 mm for Z12.7; H=10 mm for Z10.

Pin	Value
Uref	Reference Voltage
Us	Power Supply
RF	RF Out
GND	Ground
Uin	Frequency Adjustment Voltage

## Ordering Guide

Power Supply
12V
5V

Output
Sinewave
HCMOS

Package	Size
Z16	50.8x50.8x16 mm
Z12.7	50.8x50.8x12.7 mm
Z10	50.8x50.8x10 mm

**MV200- C 2 F -12V - SIN - Z12.7 - 10.0 MHz - LN**

Availability of certain stability vs. operating temperature range.		±5x10 <sup>-9</sup>	±3x10 <sup>-9</sup>	±2x10 <sup>-9</sup>	±1x10 <sup>-9</sup>	±5x10 <sup>-10</sup>	±2x10 <sup>-10</sup>	±1x10 <sup>-10</sup>	±5x10 <sup>-11</sup>
		5	3	2	1	05	02	01	005
A	0 to +55 <sup>0</sup> C	A	A	A	A	A	A	A	A
B	-10 to +60 <sup>0</sup> C	A	A	A	A	A	A	A	N
C	-20 to +70 <sup>0</sup> C	A	A	A	A	A	A	C	N
D	-40 to +70 <sup>0</sup> C	A	A	A	A	A	C	N	N
EX	-40 to +85 <sup>0</sup> C	A	A	A	A	A	C	N	N

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

Short Term Stability /1 Sec, 10 MHz		
-	LN & ULN	LN & ULN
5E-13	3E-13	2E-13

### Additional Notes:

- Contact factory for daily aging values.  
General rule:  $x10^{-x}$  /year =  $x10^{-(x+2)}$  /day.
- Advise RoHs requirement at Order.
- Contact factory for non-standard temperature ranges.

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	±2x10 <sup>-7</sup> /year	A	A	A	A
G	±1x10 <sup>-7</sup> /year	A	A	A	C
F	±5x10 <sup>-8</sup> /year	A	A	A	NA
E	±3x10 <sup>-8</sup> /year	A	A	C	NA
D	±2x10 <sup>-8</sup> /year	A	C	NA	NA
C	±1x10 <sup>-8</sup> /year	A	C	NA	NA

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

Phase Noise (dBc/Hz)	10 MHz, Sinewave, 12V	-	LN	ILN	ULN
At Offset frequency	1 Hz	<-95	<-100	<-103	<-108
	10 Hz	<-125	<-130	<-133	<-137
	100 Hz	<-145	<-153	<-155	<-157
	1 kHz	<-150	<-158	<-160	<-161
	10 kHz	<-155	<-160	<-161	<-162