



# MV220

Oven Controlled Crystal Oscillator  
10 MHz

Revised 1/30/17

Your dedicated source for crystals oscillators and filters.

### Features

- Package Height from 12.7 mm to 10 mm
- Ultra Low Phase Noise
- High Stability vs. Temperature: up to  $\pm 5 \times 10^{-10}$
- Sinewave Output
- +12V

### Applications

- Frequency synthesizer
- Test equipment
- Network clock
- Base station

## Specifications

Temperature Range	Temperature Stability Availability		Comments
	High	Higher	
0 to +55° C	$< \pm 5 \times 10^{-9}$	$< \pm 5 \times 10^{-10}$	
-10 to +60° C	$< \pm 5 \times 10^{-9}$	$< \pm 5 \times 10^{-10}$	
-20 to +70° C	$< \pm 5 \times 10^{-9}$	$< \pm 5 \times 10^{-10}$	
-40 to +70° C	$< \pm 5 \times 10^{-9}$	$< \pm 1 \times 10^{-9}$	Contact factory for $< \pm 5 \times 10^{-10}$
-40 to +85° C	$< \pm 5 \times 10^{-9}$	$< \pm 3 \times 10^{-9}$	Contact factory for $< \pm 2 \times 10^{-9}$

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
	10 MHz		
Option G	$< \pm 1 \times 10^{-7}$ /year		
Option F	$< \pm 5 \times 10^{-8}$ /year		
Option E	$< \pm 3 \times 10^{-8}$ /year		

See ordering designations at the end of this data sheet.

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

## Specifications-Continued

Phase Noise, 10 MHz, 12V, Sinewave (dBc/Hz)				
Frequency Offset	-	LN	ULN	Comments
1 Hz	< -90	< -90	< -100	
10 Hz	< -120	< -120	< -133	
100 Hz	< -153	< -153	< -158	
1 kHz	< -162	< -163	< -163	
10 kHz	< -165	< -168	< -168	

See ordering designations at the end of this data sheet.

Output Parameters	
Output	Sinewave
Level	> 800 mV
Load	50 Ohms $\pm$ 5%
Rise/Fall Time	-
Harmonics	> -30 dBc

Contact factory for lower harmonics.

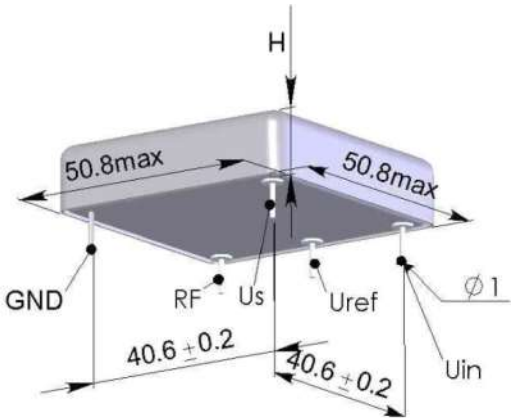
Power Supply & Voltage Control Parameters	
Specification	12V $\pm$ 5%
Steady state current @ 25 <sup>o</sup> C	< 230 mA
Peak warm-up current @ -40 <sup>o</sup> C	< 550 mA
Frequency Adjust range	> $\pm 4 \times 10^{-7}$
Frequency Adjust Voltage (Uin)	0 to +5V
Reference Voltage (Uref)	+5V

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 <sup>o</sup> C
RoHs	Option

Contact factory for extended environmental conditions.

## Outline Drawing



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

Alan Deviation (ADEV)
$<5 \times 10^{-12}$

Package	Size
Z10	50x50.8x10 mm
Z12.7	50x50x12.7 mm

### MV220- C 2 E - Z12.7 - 10.0 MHz - LN

Availability of certain stability vs. operating temperature range.		$\pm 5 \times 10^{-9}$	$\pm 3 \times 10^{-9}$	$\pm 2 \times 10^{-9}$	$\pm 1 \times 10^{-9}$	$\pm 5 \times 10^{-10}$
		5	3	2	1	05
A	0 to +55° C	A	A	A	A	A
B	-10 to +60° C	A	A	A	A	A
C	-20 to +70° C	A	A	A	A	A
D	-40 to +70° C	A	A	A	A	C
EX	-40 to +85° C	A	A	C	C	C

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

Availability of certain aging values for certain frequencies.		Standard Frequency 10 MHz
G	$\pm 1 \times 10^{-7}$ /year	A
F	$\pm 5 \times 10^{-8}$ /year	A
E	$\pm 3 \times 10^{-8}$ /year	A

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

Phase Noise (dBc/Hz)		LN	ULN
10 MHz, Sinewave, 12V	-		
At Offset frequency	1 Hz	<-90	<-100
	10 Hz	<-120	<-133
	100 Hz	<-153	<-158
	1 kHz	<-162	<-163
	10 kHz	<-165	<-168

**Additional Notes:**

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