



Your dedicated source for crystals oscillators and filters.

Features

- Package Height from 16 mm to 12.7 mm
- Ultra Low Phase Noise
- High Stability vs. Temperature: up to $\pm 2 \times 10^{-10}$
- 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	$< \pm 5 \times 10^{-9}$	$< \pm 1 \times 10^{-9}$	
-10 to +60° C	$< \pm 5 \times 10^{-9}$	$< \pm 2 \times 10^{-9}$	Contact factory for $< \pm 1 \times 10^{-9}$
-20 to +70° C	$< \pm 5 \times 10^{-9}$	$< \pm 2 \times 10^{-9}$	
-40 to +70° C	$< \pm 5 \times 10^{-9}$	$< \pm 2 \times 10^{-9}$	
-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		
Option D	$< \pm 2 \times 10^{-8}$ /year		

See ordering designations at the end of this data sheet.

Specification	Short Term, Pulling & Pushing Stability		Comments
	Value	Option	
Short term stability per 1 sec.	$< 5 \times 10^{-12}$	$< 6 \times 10^{-13}$	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

Frequency Offset	Phase Noise, 10 MHz, 12V, Sinewave (dBc/Hz)				Comments
	-	LN	ULN	M	
1 Hz	< -100	< -105	< -100	< -110	
10 Hz	< -130	< -135	< -138	< -140	
100 Hz	< -153	< -155	< -158	< -158	
1 kHz	< -162	< -163	< -165	< -166	
10 kHz	< -165	< -168	< -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.

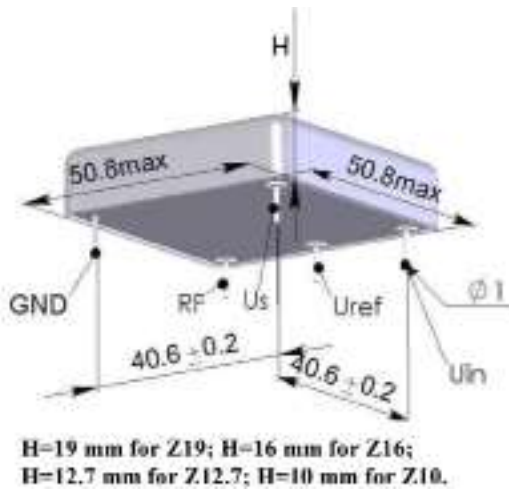
Power Supply & Voltage Control Parameters	
Specification	12V \pm 5%
Steady state current @ 25 ^o C	< 250 mA
Peak warm-up current @ -40 ^o C	< 600 mA
Frequency Adjust range	> $\pm 4 \times 10^{-7}$
Frequency Adjust Voltage (Uin)	0 to +5V
Reference Voltage (Uref)	+5V

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 ^o C
RoHs	Option

Contact factory for extended environmental conditions.

Outline Drawing



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

Ordering Guide

Alan Deviation (ADEV)	
<5x10 ⁻¹²	<6x10 ⁻¹³ (Opt)

Package	Size
Z16	50x50.8x16 mm
Z12.7	50x50x12.7 mm

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

Availability of certain stability vs. operating temperature range.		±5x10 ⁻⁹			
		5	3	2	1
A	0 to +55° C	A	A	A	A
B	-10 to +60° C	A	A	A	C
C	-20 to +70° C	A	A	A	N
D	-40 to +70° C	A	A	A	N
EX	-40 to +85° C	A	A	C	N

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

Short Term Stability (ADEV)/1 Sec, 10 MHz	
-	Option
5E-12	6E-13

Availability of certain aging values for certain frequencies.		Standard Frequency 10 MHz
G	±1x10 ⁻⁷ /year	A
F	±5x10 ⁻⁸ /year	A
E	±3x10 ⁻⁸ /year	A
D	±2x10 ⁻⁸ /year	A

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

Phase Noise (dBc/Hz) 10 MHz, Sinewave, 12V	-	LN	ULN	M
At Offset frequency 1Hz	<-100	<-105	<-100	<-110
10 Hz	<-130	<-135	<-138	<-140
100 Hz	<-153	<-155	<-158	<-158
1 kHz	<-162	<-163	<-165	<-166
10 kHz	<-165	<-168	<-168	<-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.