



# MV87

Oven Controlled Crystal Oscillator  
48-700 MHz

Revised 1/1/15

Your dedicated source for crystal oscillators and filters.

## Features

- Frequency Range 48.0-120.0 MHz Without Multiplication
- Low Phase Noise Floor at <173 dBc/Hz
- High Stability vs. Temperature: up to  $\pm 5 \times 10^{-8}$
- Low Harmonics and Sub-Harmonics (Optional)
- HCMOS and Sinewave Output
- Low Profile (12.7 mm) with Optional SMA Output
- +12V

## Applications

- Frequency synthesizer
- Test equipment
- VSAT
- PLL

## Specifications

Temperature Range	Temperature Stability Availability		Comments
	High	Higher	
0 to +55° C	$< \pm 5 \times 10^{-7}$	$< \pm 5 \times 10^{-8}$	
-10 to +60° C	$< \pm 5 \times 10^{-7}$	$< \pm 7.5 \times 10^{-8}$	Contact factory for $< \pm 5 \times 10^{-8}$
-20 to +70° C	$< \pm 5 \times 10^{-7}$	$< \pm 1 \times 10^{-7}$	Contact factory for $< \pm 7.5 \times 10^{-8}$
-40 to +70° C	$< \pm 5 \times 10^{-7}$	$< \pm 1 \times 10^{-7}$	Contact factory for $< \pm 7.5 \times 10^{-8}$

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	
	High	Higher
48.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$
56.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$
60.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$
80.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$
100.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$
400.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$
500.0 MHz	$< \pm 1 \times 10^{-6}$	$< \pm 3 \times 10^{-7}$

See ordering designations at the end of this data sheet.

Specification	Pulling & Pushing Stability	
	Standard	Comments
Short term stability per 1 sec. (Allen deviation)	-	-
Stability vs. Load ( $\pm 10\%$ )	$< \pm 5 \times 10^{-8}$	
Stability vs. power supply ( $\pm 10\%$ )	$< \pm 5 \times 10^{-8}$	
Warm-up time to w/ in $< \pm 2 \times 10^{-7}$	<3 minutes	@25° C

Contact factory for short term stability and see ordering designations at the end of this data sheet.

## Specifications-Continued

Option	Phase Noise (dBc/Hz)									
	1		2		3		4	5	6	7
Frequency	100	500	100	500	100	500	100	100	100	100
10 Hz	<-85	<-70	<-90	<-75	<-95	<-80	<-98	<-100	<-100	<-97
100 Hz	<-115	<-100	<-120	<-105	<-125	<-110	<-128	<-130	<-130	<-128
1 kHz	<-140	<-125	<-145	<-130	<-150	<-135	<-150	<-152	<-155	<-155
10 kHz	<-160	<-140	<-162	<-142	<-165	<-145	<-165	<-165	<-167	<-173

See ordering designations at the end of this data sheet.

## Output Parameters

Output	Sinewave
Level	> 400 mV
Load	50 Ohms $\pm$ 10%
Rise/Fall Time	-
Harmonics	> -25 dBc
Harmonics Option w/ Type G Package	> -40 dBc

See ordering designations at the end of this data sheet.

## Power Supply &amp; Voltage Control Parameters

Specification	12V $\pm$ 10%
Steady state current @ 25 <sup>o</sup> C	< 150 mA
Peak warm-up current	< 450 mA
Frequency Adjust range	> $\pm$ 3x10 <sup>-6</sup>
Frequency Adjust Voltage (Uin)	0 to +8V
Reference Voltage (Uref)	+8V

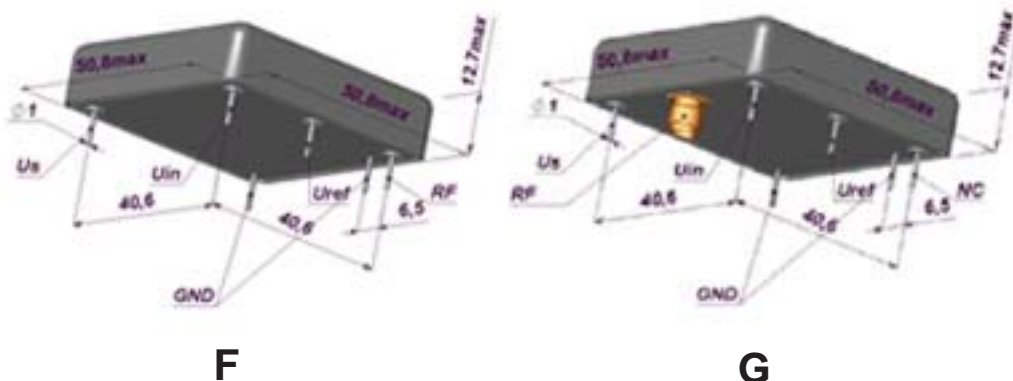
See ordering designations at the end of this data sheet.

## Environmental Parameters

Specification	Conditions
Vibration Frequency	10-500 Hz
Vibration Acceleration	5 g
Shock Acceleration	-
Shock Duration	-
Humidity	-
Storage Temperature	-55 to +80 <sup>o</sup> 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

Package Type	
50.8x50.8x12.7	
48.0-120 MHz	F
100.0-700.0 MHz	G

**MV87 - B 300 J - 3 - 100.0 MHz - LN - F**

Availability of certain stability vs. operating temperature range.		$\pm 5 \times 10^{-7}$	$\pm 3 \times 10^{-7}$	$\pm 1 \times 10^{-7}$	$\pm 7.5 \times 10^{-8}$	$\pm 5 \times 10^{-8}$
		500	300	100	75	50
A	0 to +55° C	A	A	A	A	A
B	-10 to +60° C	A	A	A	A	C
C	-20 to +70° C	A	A	A	C	N
D	-40 to +70° C	A	A	A	C	N

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

Availability of certain aging values for certain frequencies.		Standard Frequencies						
		48.0 MHz	56.0 MHz	60.0 MHz	80.0 MHz	100.0 MHz	400.0 MHz	500.0 MHz
K	$\pm 1 \times 10^{-6}$ /year	A	A	A	A	A	A	A
J	$\pm 5 \times 10^{-7}$ /year	A	A	A	A	A	A	A
I	$\pm 3 \times 10^{-7}$ /year	A	A	A	A	A	A	A

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

Phase Noise, 12V, Sinewave (dBc/Hz)										
Option	1		2		3		4	5	6	7
Frequency	100	500	100	500	100	500	100	100	100	100
10 Hz	<-85	<-70	<-90	<-75	<-95	<-80	<-98	<-100	<-100	<-97
100 Hz	<-115	<-100	<-120	<-105	<-125	<-110	<-128	<-130	<-130	<-128
1 kHz	<-140	<-125	<-145	<-130	<-150	<-135	<-150	<-152	<-155	<-155
10 kHz	<-160	<-140	<-162	<-142	<-165	<-145	<-165	<-165	<-167	<-173

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.