

TO-8 Packaged Voltage Controlled Oscillators 300 MHz - 10 GHz MLO 60000 Series

V3.00

Features

- PCB Compatible
- Low Cost
- Mil and Commercial Designs
- Broad Frequency Ranges
- Low Phase Noise

Description

M/A-COM's range of TO-8 voltage controlled oscillators (VCOs) provides excellent tuning linearity and phase noise for both narrow and broad bandwidth system applications.

These designs use either a silicon bipolar transistor or FET device, dependent on frequency, as the negative resistance generator. The frequency of oscillation is determined by a varactor diode which serves as a voltage variable capacitor in a tuned circuit. For wide bandwidth designs a GaAs hyperabrupt varactor is selected to give the greatest capacitance and therefore frequency, change against tuning voltage with the best linearity. For narrow bandwidth designs a silicon abrupt varactor offers the lowest phase noise performance. Careful selection of the varactor diodes, manufactured in house by M/A-COM produces linear, monotonic tuning characteristics requiring only simple external driver circuits.

This range of VCOs are constructed using discrete chip devices integrated into a conventional alumina MIC which is packaged in a standard TO-8 outline. The package is hermetically sealed by resistance seam welding. This compact, rugged yet low cost construction allows simple installation on a conventional PCB and finds a wide range of applications in demanding military, hi-rel and commercial systems.

Where oscillators with very fast tuning speeds over up to octave frequency bandwidths are required VCOs offer significant performance advantages. VCOs give improved LO frequency tuning speed and output power flatness in microwave receivers and rapid generation of output signals in frequency agile transmitters. Where an oscillator with high frequency stability is required, as in radar or communications synthesizers and converters, the VCO can be used in a phase locked loop circuit. This produces a frequency stability comparable to that of the reference crystal oscillator. The phase locked loop circuit can be designed to stabilize a single output frequency or to vary the oscillator frequency continuously or in discrete steps as small as required.

MLO 60000 Series oscillators can be qualified for high reliability and military requirements in addition to the standard commercial specification. A wide range of custom designs is also available, please contact the factory to discuss your requirements.

Specifications Subject to Change Without Notice.

SPECIFICATIONS (guaranteed -55°C to +85°C)

| Centre Freq (GHz) Min/Max | Tuning Band (MHz) Min | Freq Pushing (MHz/V) Max | Freq Pulling (MHz) Max | Freq Drift | Phase Noise @ +25°C (dBc/Hz) | | Harmonic Related Outputs | Output Power | Output Power Variation | Current Consumption @+15V | |
|------------------------------------|--------------------------------|-----------------------------------|---------------------------------|---------------|---------------------------------|--------------|--------------------------------|-----------------|------------------------------|---------------------------------|----------------|
| | | | | | @100KHz Max | @1MHz Max | (dBc) Max | (dBm) Min | (dB) Max | (mA) Max | Part Number |
| 0.5-0.74 | 100 | 1.5 | 40 | 30 | -105 | -125 | -14 | +10 | ±2.0 | 50 | MLO 61100 |
| | 200 | 1.5 | 40 | 30 | -105 | -125 | -14 | +10 | ±2.0 | 50 | MLO 62100 |
| 0.75-1.49 | 100 | 5 | 20 | 30 | -108 | -128 | -15 | +10 | ±2.0 | 50 | MLO 61100 |
| | 200 | 5 | 20 | 35 | -108 | -128 | -10 | +10 | ±2.0 | 50 | MLO 62100 |
| | 500 | 5 | 20 | 40 | -108 | -128 | -10 | +10 | ±2.5 | 50 | MLO 63100 |
| | 100 | 15 | 40 | 40 | -108 | -128 | -15 | +10 | ±2.0 | 50 | MLO 61100 |
| 1.5 -2.99 | 200 | 15 | 40 | 60 | -105 | -125 | -10 | +10 | ±2.0 | 50 | MLO 62100 |
| | 500 | 15 | 40 | 70 | -102 | -122 | -10 | +10 | ±2.5 | 50 | MLO 63100 |
| | 1000 | 15 | 60 | 90 | -98 | -118 | -8 | +10 | ±2.5 | 100 | MLO 64100 |
| 3.0 -4.49 | 100 | 10 | 40 | 70 | -100 | -120 | -15 | +10 | ±2.0 | 50 | MLO 61100 |
| | 200 | 10 | 40 | 70 | -100 | -120 | -12 | +10 | ±2.0 | 50 | MLO 62100 |
| | 500 | 10 | 40 | 90 | -100 | -120 | -10 | +10 | ±2.5 | 50 | MLO 63100 |
| | 1000 | 10 | 60 | 110 | -100 | -120 | -10 | +10 | ±2.5 | 100 | MLO 64100 |
| | 2000 | 10 | 60 | 120 | -98 | -118 | -10 | +10 | ±2.5 | 100 | MLO 65100 |
| 4.5 -5.99 | 100 | 10 | 50 | 100 | -100 | -120 | -12 | +10 | ±2.0 | 50 | MLO 61100 |
| | 200 | 10 | 50 | 100 | -100 | -120 | -12 | +10 | ±2.0 | 50 | MLO 62100 |
| | 500 | 10 | 50 | 110 | -95 | -115 | -12 | +10 | ±2.5 | 50 | MLO 63100 |
| | 1000 | 16 | 70 | 110 | -90 | -110 | -10 | +10 | ±2.5 | 100 | MLO 64100 |
| | 2000 | 16 | 70 | 120 | -85 | -105 | -10 | +10 | ±2.5 | 100 | MLO 65100 |
| | 3000 | 35 | 70 | 130 | -80 | -100 | -10 | +10 | ±2.5 | 100 | MLO 66100 |
| 6.0 -8.0 | 200 | 30 | 30 | 180 | -85 | -105 | -12 | +10 | ±2.0 | 100 | MLO 62100 |
| | 500 | 30 | 3 0 | 200 | -85 | -105 | -12 | +10 | ±2.0 | 100 | MLO 63100 |
| | 1000 | 30 | 30 | 220 | -80 | -100 | -10 | +10 | ±2.5 | 100 | MLO 64100 |
| | 2000 | 30 | 30 | 220 | -75 | -95 | -10 | +10 | ±2.5 | 100 | MLO 65100 |
| | 3000 | 30 | 30 | 250 | -70 | -90 | -10 | +10 | ±2.5 | 100 | MLO 66100 |
| | 4000 | 30 | 40 | 250 | -60 | -80 | -10 | +10 | ±2.5 | 100 | MLO 67100 |

NOTES

1) Frequency pushing See above for voltages $+15V \pm 5\%$.

2) Frequency pulling See above into a 1.5:1 VSWR load all phases.

3) Spurious outputs -60dBc maximum

4) Tuning voltage in the range 0 to +20V, or other if required, please contact the factory for details.

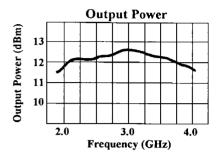
5) Case Operating temperature range -55°C to +85°C Storage temperature range -55°C to +100°C

When ordering please specify the centre frequency required in MHz as a 5 digit suffix to the part number above e.g. for a centre frequency of 5000 MHz, bandwidth of 200 MHz the part number would be MLO 62100-05000.

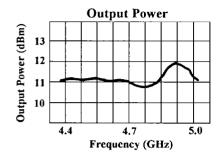
Fax (800) 618-8883

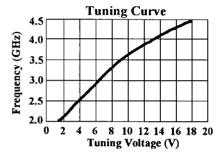
TYPICAL PERFORMANCE

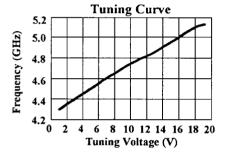
PART NO. MLO65100-03000

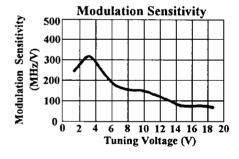


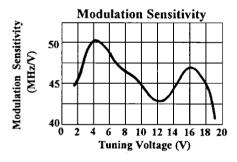
PART NO. MLO63100-04700

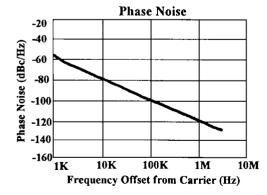


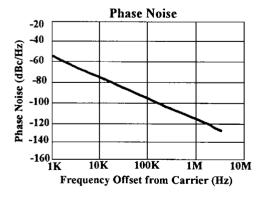








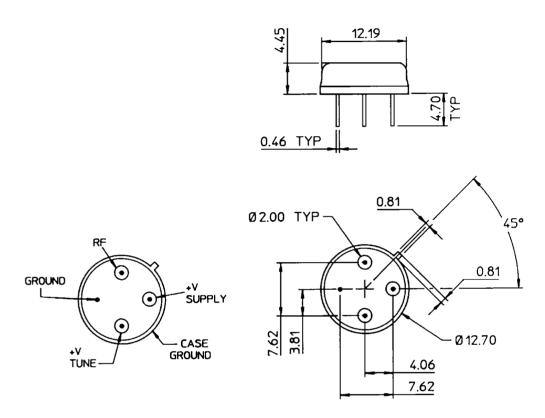




M/A-COM, Inc.

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OUTLINE DRAWING



DRAWING NOTES

Third Angle Projection

All dimensions in mm

Tolerances $x.x = \pm 0.5 mm$

 $x.xx = \pm 0.2mm$

Standard Finish Gold plate, base and pins

nickel plate lid.

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