

## FEATURES

- Superior Phase Noise
- 1 kHz Step Size
- External Reference 10-200 MHz (Optional)
- Fits in a Single Slot PXI
- 5 Line Serial & USB Control

## DESCRIPTION

The **MLMS-Series** of YIG-Based wideband synthesizers are ideal as the main local oscillators in receiving systems, frequency converters and test and measurement equipment. They provide 1 kHz frequency resolution over the 250 MHz to 16 GHz frequency range. Power levels of +8 to +13 dBm are provided through out the series and full band tuning speed is 1-3 mSec. The units are 2.5" x 2.5" x .65" high and fit a 1 Slot PXI chassis.

## APPLICATIONS

Test Equipment  
 Local Oscillators  
 Frequency Converters



## PERFORMANCE SPECIFICATIONS

(Operating Case Temperature: 0° to +60° C Baseplate) (Note 1)

Model No.	MLMS-0260	MLMS-2080	MLMS-6013	MLMS-8016
<b>RF Specifications</b>				
Output Frequency (Note 2)	0.25-6 GHz	2-8 GHz	6-13 GHz	8-16 GHz
Output Power Min.	+11 dBm	+13 dBm	+10 dBm	+8 dBm
Po Variation over Freq/Temp	5 dB	4 dB	5 dB	6 dB
Step Size, Min.	1 kHz	1 kHz	1 kHz	1 kHz
Switching Speed, 100 MHz Step (Note 6)	1 mS	1 mS	1 mS	1 mS
1000 MHz Step	2 mS	2 mS	2 mS	2 mS
Full Band Step	3 mS	3 mS	3 mS	3 mS
Warm-up Time ("Lock") mSec	250	250	250	250
Output Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Load VSWR	2.0:1	2.0:1	2.0:1	2.0:1
Harmonics	-8 dBc	-12 dBc	-20 dBc	-20 dBc
Non-Harmonic Spurious				
100 Hz f off ≤500 kHz	-60 dBc	-60 dBc	-60 dBc	-60 dBc
>500 kHz	-60 dBc	-80 dBc	-80 dBc	-80 dBc
<b>Phase Noise Performance</b>				
(with Internal Crystal Reference)				
@ 100 Hz Offset	74 dBc/Hz	72 dBc/Hz	70 dBc/Hz	68 dBc/Hz
@ 1 kHz Offset	94 dBc/Hz	93 dBc/Hz	88 dBc/Hz	84 dBc/Hz
@ 10 kHz Offset	96 dBc/Hz	95 dBc/Hz	90 dBc/Hz	88 dBc/Hz
@ 100 kHz Offset	119 dBc/Hz	117 dBc/Hz	116 dBc/Hz	115 dBc/Hz
@ 1 MHz Offset	142 dBc/Hz	142 dBc/Hz	142 dBc/Hz	138 dBc/Hz
@ 10 MHz Offset	150 dBc/Hz	156 dBc/Hz	156 dBc/Hz	156 dBc/Hz

## MLMS PERFORMANCE SPECIFICATIONS (Continued)

Model No.	MLMS-0260	MLMS-2080	MLMS-6013	MLMS-8016
<b>Reference Oscillator Options</b>				
<b>Option A</b>				
External Reference (Note 3)	50 - 200 MHz	50 - 200 MHz	50 - 200 MHz	50 - 200 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability (<+/- 20ppm)	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied
<b>Option B</b>				
External Reference with Internal Crystal (Note 4)	10 - 200 MHz	10 - 200 MHz	10 - 200 MHz	10 - 200 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability (<+/- 10ppm)	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied
<b>Supply Voltage &amp; Current</b>				
+15 Vdc ( $\pm 0.5$ ) Vdc) (Note 5)	350 mA / 5.25W	450 mA / 6.75 W	500 mA / 7.5 W	550 mA / 8.25 W
+5 Vdc ( $\pm 0.25$ ) Vdc)	550 mA / 2.75 W	450 mA / 2.25 W	550 mA / 2.75 W	550 mA / 2.75 W
Total Power dissipation	<8.0 Watts	<9.0 Watts	<10.25 Watts	<11.0 Watts
<b>Supply Voltage Ripple</b> (Pk-Pk from 60 Hz to 3 MHz)	<100 mV	<100 mV	<100 mV	<100 mV
<b>Control Format (3.3V CMOS)</b>	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB
<b>Phase Lock Alarm (J1-8) 3.3 V CMOS Logic</b>	1=Locked	1=Locked	1=Locked	1=Locked
<b>Weight</b>	4.0 oz / 113 g	4.0 oz / 113 g	4.0 oz / 113 g	4.0 oz / 113 g
<b>Outline</b>	211-001	211-001	211-001	211-001

### MLMS Options:

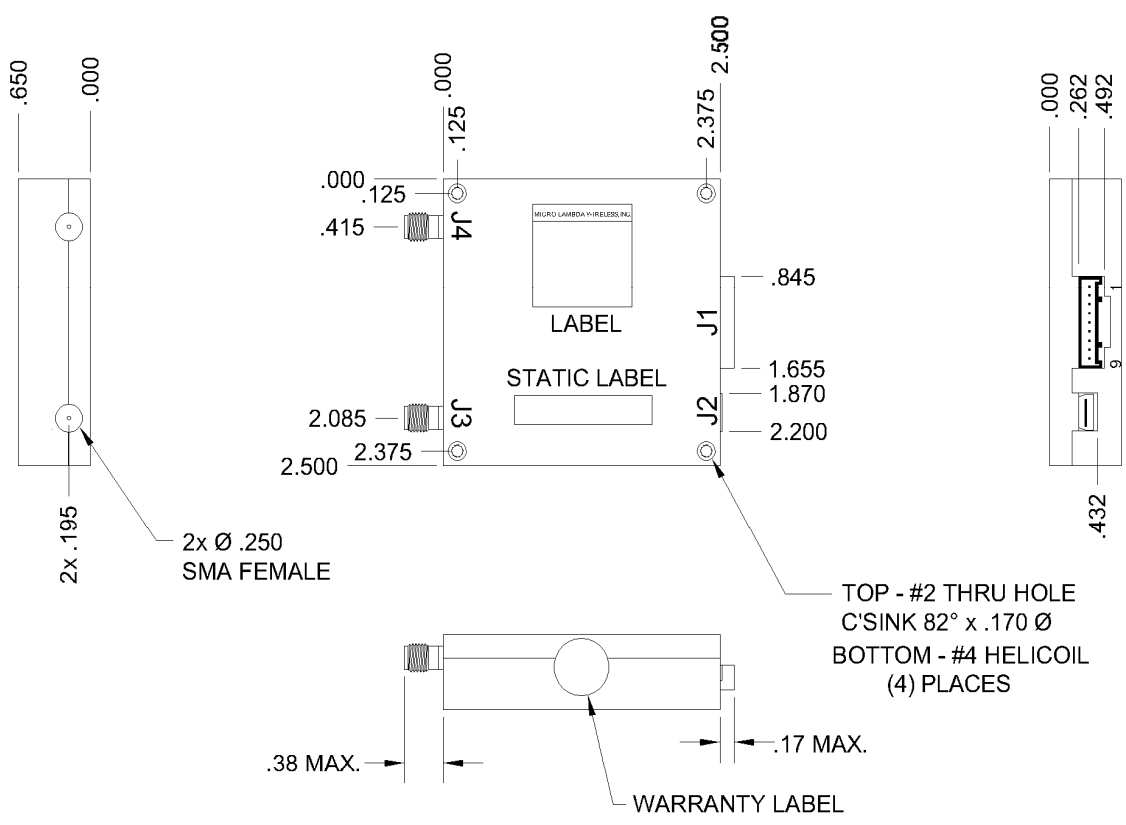
**Option A:** External Reference / No Internal Reference

**Option B:** Internal Reference / External Reference

Part Number Example: MLMS-2080A 2 GHz to 8 GHz with External Reference.

#### Notes:

- 1) Extended operating temperature range available.
- 2) Customer specified frequency ranges available.
- 3) 50-100 MHz OCXO recommended for best phase noise performance. External reference directly effects phase noise performance.
- 4) Output phase noise performance is not dependent on external reference phase noise.
- 5) +15Vdc required for wideband units (>4 GHz tuning range). +12Vdc available for  $\leq 4$  GHz tuning range.
- 6) For frequency settings <500 MHz, switching speed = 2.0 mS.



**NOTES :**

- J1 MALE: - MOLEX# 0353630960 - J1 POWER SUPPLY INPUTS REQUIRED FOR USB OPERATION
- J1 MATES WITH: - MOLEX# 0355070900 - J1 RECOMMENDED WIRE SIZE = A.W.G. 22-24
- CRIMP PIN: - MOLEX# 0502128100 (\*) ACTIVE LOW

CONNECTIONS			
CONN.	TYPE	PIN #	FUNCTION
J1	35363-0960	1	+15 VDC, +12V OPT.
J1	35363-0960	2	GROUND (PWR/LOGIC)
J1	35363-0960	3	+ 5 VDC
J1	35363-0960	4	SERIAL CLOCK
J1	35363-0960	5	SERIAL DATA IN
J1	35363-0960	6	SERIAL SELECT/ENABLE
J1	35363-0960	7	SERIAL BUSY
J1	35363-0960	8	LOCK ALARM OUT
J1	35363-0960	9	SERIAL DATA OUT

CONNECTIONS			
CONN.	TYPE	PIN #	FUNCTION
J2	USB MINI-B	1	+V
J2	USB MINI-B	2	D-
J2	USB MINI-B	3	D+
J2	USB MINI-B	4	GND
J2	USB MINI-B	5	GND
J3	SMA-FEMALE	1	REF. INPUT
J4	SMA-FEMALE	1	RF OUTPUT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE: FRACTIONS    DECIMALS    ANGLES ±                ±                ±	CONTRACT NO.			<b>MICRO LAMBDA WIRELESS, INC.</b>		
	APPROVALS	DATE				
WEIGHT	DRAWN	ENGR.	<i>MLMS SYNTHESIZER, EXT. REF.</i>			
4.0 Oz. / 113.4gr	N. NGUYEN	9/25/15				
FINISH	MANUF.	G.A.	SIZE	CAGE No	DWG. NO.	REV.
NICKEL				ORN63	99 - 0211 - 001	A
DO NOT SCALE DRAWING						