

FEATURES

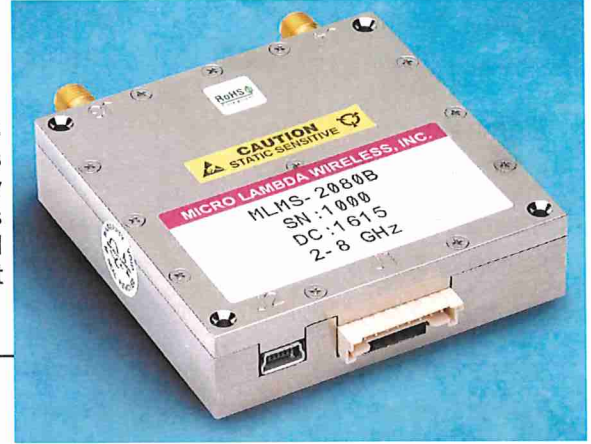
- Superior Phase Noise
- 1 kHz Step Size
- External or Internal Reference
- Fits in a Single Slot PXI
- 5 Line Serial & USB Control

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 32 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-4010	MLMS-6013	MLMS-8020	MLMS-2832
-----------	-----------	-----------	-----------	-----------	-----------	-----------

RF Specifications

Output Frequency (Note 2)	0.25-6 GHz	2-8 GHz	4-10 GHz	6-13 GHz	8-20 GHz	28-32 GHz
Output Power Min.	+11 dBm	+13 dBm	+10 dBm	+10 dBm	+8 dBm	+10 dBm
Po Variation over Freq/Temp	5 dB	4 dB	4 dB	6 dB	6 dB	5 dB
Step Size, Min.	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz
Switching Speed, 100 MHz Step (Note 6)	1 mS	1 mS	1 mS	1 mS	1 mS	1 mS
1000 MHz Step	2 mS	2 mS	2 mS	2 mS	2 mS	2 mS
Full Band Step	3 mS	3 mS	3 mS	3 mS	3 mS	3 mS
Warm-up Time ("Lock") mSec	250	250	250	250	250	250
Output Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Load VSWR	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1
Harmonics & Subharmonics	-8 dBc	-12 dBc	-17 dBc	-17 dBc	-15 dBc	-20 dBc
Non-Harmonic Spurious	-60 dBc	-60 dBc	-60 dBc	-60 dBc	-54 dBc	-54 dBc

Phase Noise Performance

(with Internal Crystal Reference)

@ 100 Hz Offset	75 dBc/Hz	78 dBc/Hz	76 dBc/Hz	70 dBc/Hz	68 dBc/Hz	63 dBc/Hz
@ 1 kHz Offset	94 dBc/Hz	93 dBc/Hz	91 dBc/Hz	88 dBc/Hz	85 dBc/Hz	83 dBc/Hz
@ 10 kHz Offset	96 dBc/Hz	95 dBc/Hz	91 dBc/Hz	90 dBc/Hz	86 dBc/Hz	83 dBc/Hz
@ 100 kHz Offset	119 dBc/Hz	117 dBc/Hz	117 dBc/Hz	116 dBc/Hz	113 dBc/Hz	113 dBc/Hz
@ 1 MHz Offset	142 dBc/Hz	142 dBc/Hz	144 dBc/Hz	142 dBc/Hz	138 dBc/Hz	137 dBc/Hz
@ 10 MHz Offset	150 dBc/Hz	156 dBc/Hz	161 dBc/Hz	156 dBc/Hz	152 dBc/Hz	145 dBc/Hz
@ 100 MHz Offset	170 dBc/Hz	170 dBc/Hz	168 dBc/Hz	168 dBc/Hz	157 dBc/Hz	155 dBc/Hz

MLMS PERFORMANCE SPECIFICATIONS (Continued)

Model No.	MLMS-0260	MLMS-2080	MLMS-4010	MLMS-6013	MLMS-8020	MLMS-2832
Reference Oscillator Options						
Option A						
External Reference (Note 3)	50 - 200 MHz	50 - 200 MHz	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	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability (<+/- 20ppm)	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied
Option B						
External Reference with Internal Crystal (Note 4)	10 - 200 MHz	10 - 200 MHz	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	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability (<+/- 10ppm)	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied
Option C						
Internal Reference	100.0 MHz	100.0 MHz	100.0 MHz	100.0 MHz	100.0 MHz	100.0 MHz
Internal Frequency Accuracy (Note7)	2.5ppm	2.5ppm	2.5ppm	2.5ppm	2.5ppm	2.5ppm
Frequency Stability (0 to 60 °C)	1.0ppm	1.0ppm	1.0ppm	1.0ppm	1.0ppm	1.0ppm
Yearly Aging	1.5ppm	1.5ppm	1.5ppm	1.5ppm	1.5ppm	1.5ppm
Supply Voltage & Current						
+15 Vdc (± 0.5 Vdc) (Note 5)	350 mA	450 mA	450 mA	500 mA	450 mA	300 mA
+5 Vdc (± 0.25 Vdc)	550 mA	450 mA	550 mA	550 mA	550 mA	650 mA
Total Power dissipation	<8.0 Watts	<9.0 Watts	<10.25 Watts	<11.0 Watts	<9.5 Watts	<7.65 Watts
Supply Voltage Ripple (Pk-Pk from 60 Hz to 3 MHz)	<100 mV	<100 mV	<100 mV	<100 mV	<100 mV	<100 mV
Control Format (3.3V CMOS)	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB
Phase Lock Alarm (J1-8) 3.3 V CMOS Logic	1=Locked	1=Locked	1=Locked	1=Locked	1=Locked	1=Locked
Weight	4.0 oz / 113 g	4.0 oz / 113 g	4.0 oz / 113 g	4.0 oz / 113 g	4.0 oz / 113 g	4.0 oz / 113 g
Outline	211-001	211-001	211-001	211-001	211-001	211-001

MLMS Options:

Option A: External Reference / No Internal Reference

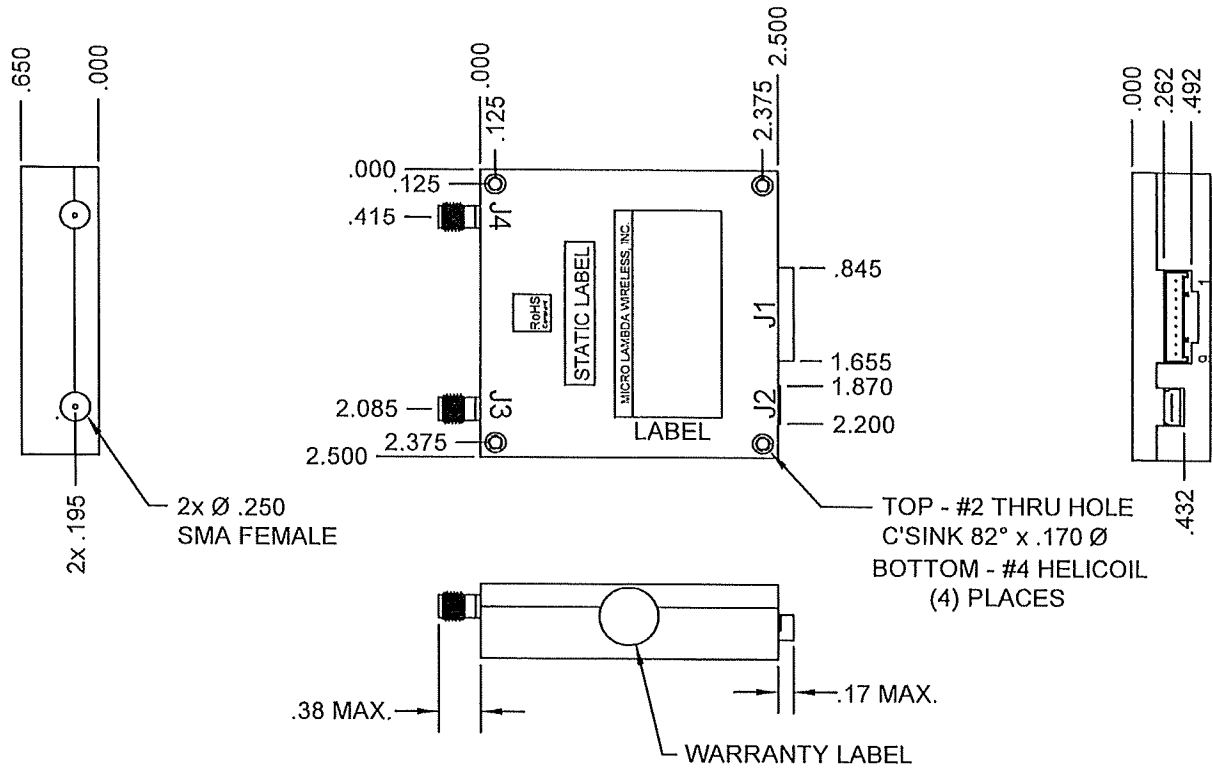
Option B: External Reference / Internal Reference

Option C: Internal Reference Oscillator

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 ≤ 4 GHz tuning range.
- 6) For frequency settings <500 MHz, switching speed = 2.0 mS.
- 7) Improved accuracy is available upon request.




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 OR NC
J4	SMA-FEMALE	1	RF OUTPUT

NOTES:

- 1. J1 MALE: MOLEX# 0353630960
- 2. J1 MATES WITH: MOLEX# 0355070900
- 3. CRIMP PIN: MOLEX#0502128100
- 4. J1 POWER SUPPLY INPUTS ARE REQUIRED FOR USB AND SPI OPERATION.
- 5. J1 RECOMMENDED POWER SUPPLY WIRE SIZE = A.W.G. 22-24
- 6. SMA ENGAGE/DISENGAGE TORQUE: 2 INCH-POUNDS MAX.
- 7. SMA MATING TORQUE (ROTATIONAL): 8 INCH POUNDS MAX.
- 8. SMA CONTACT RETENTION: 6 LBS. MIN. AXIAL FORCE ON MATING END. 4 IN-OZ MIN. RADIAL TORQUE.
- 9. (*) ACTIVE LOW

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE: FRACTIONS DECIMALS ANGLES A .XX ± .02 B .XXX ± .010	CONTRACT NO.		 MICRO LAMBDA WIRELESS, INC.								
	APPROVALS	DATE									
WEIGHT 4.0 Oz. / 113.4gr	DRAWN N. NGUYEN	3/25/2021	<i>MLMS SYNTHESIZER, EXT. REF.</i>								
FINISH NICKEL	ENGR DS	3/25/21									
DO NOT SCALE DRAWING	MANUF. Q A		<table border="1" style="width: 100%;"> <tr> <td>SIZE</td> <td>CAGE ID#</td> <td>DWG NO.</td> <td>REV.</td> </tr> <tr> <td></td> <td>0RN63</td> <td>99 - 0211 - 001</td> <td>C</td> </tr> </table>	SIZE	CAGE ID#	DWG NO.	REV.		0RN63	99 - 0211 - 001	C
SIZE	CAGE ID#	DWG NO.	REV.								
	0RN63	99 - 0211 - 001	C								