

## FEATURES

- Superior Phase Noise
- 1 kHz Step Size
- External Reference 1-200 MHz (Optional)
- PXI, Compact PCI Size Compatible
- 5 Line Serial & USB Control

## DESCRIPTION

The **MLSP-Series** of YIG-Based synthesizers are specifically designed for VSAT applications. They provide 1 kHz frequency resolution over the 600 MHz to 20 GHz frequency range. Power levels of +8 to +13 dBm are provided through out the series and full band tuning speed is 6 mSec. The units are 5" x 3" x 1" high and fit a 2 slot PXI chassis.



## PERFORMANCE SPECIFICATIONS

(Operating Case Temperature: -20° to +70° C Baseplate)

Model No.	MLSP-4214	MLSP-4689	MLSP-1113
<b>RF Specifications</b>			
Output Frequency	4.2-14.2 GHz	4.6-8.9 GHz	11.6-13.9 GHz
Output Power Min.	+12 dBm	+13 dBm	+13 dBm
Po Variation over Freq/Temp	4 dB	3 dB	3 dB
Step Size, Min.	1 kHz	1 kHz	1 kHz
Switching Speed, 100 MHz Step, Typ.	1 mS	1 mS	1 mS
1000 MHz Step, Typ.	3 mS	3 mS	3 mS
Full Band Step, Typ.	6 mS	5 mS	5 mS
Warm-up Time ("Lock") @ 0C (Minutes) (with Internal Crystal Reference)	3.0	3.0	3.0
Output Impedance	50 Ohms	50 Ohms	50 Ohms
Load VSWR	2.0:1	2.0:1	2.0:1
Harmonics	-12 dBc	-12 dBc	-12 dBc
Non-Harmonic Spurious	-60 dBc	-60 dBc	-60 dBc
<b>Phase Noise Performance</b> (with Internal Crystal Reference)			
@ 100 Hz Offset	75 dBc/Hz	80 dBc/Hz	72 dBc/Hz
@ 1 kHz Offset	90 dBc/Hz	95 dBc/Hz	89 dBc/Hz
@ 10 kHz Offset	88 dBc/Hz	97 dBc/Hz	90 dBc/Hz
@ 100 kHz Offset	115 dBc/Hz	117 dBc/Hz	115 dBc/Hz
@ 1 MHz Offset	138 dBc/Hz	142 dBc/Hz	138 dBc/Hz

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**MLSP PERFORMANCE SPECIFICATIONS (Continued)**

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<b>Model No.</b>	<b>MLSP-4214</b>	<b>MLSP-4689</b>	<b>MLSP-1113</b>
<b>Reference Oscillator Options</b>			
<b>Option A</b>			
External Reference (Note 1)	1 - 200 MHz	1 - 200 MHz	1 - 200 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability (< +/- 20ppm)	Cust Supplied	Cust Supplied	Cust Supplied
<b>Option B</b>			
External Reference with Internal Crystal (Note 2)	1 - 100 MHz	1 - 100 MHz	1 - 100 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability (Note 4)	Cust Supplied	Cust Supplied	Cust Supplied
<b>Option C</b>			
Internal Reference	100 MHz	100 MHz	100 MHz
Frequency Stability	+/- 1 PPM	+/- 1 PPM	+/- 1 PPM
<b>Supply Voltage &amp; Current (Note 3)</b>			
+15 Vdc ( $\pm 0.5$ ) Vdc	1400 mA	900 mA	1400 mA
+5 Vdc ( $\pm 0.25$ ) Vdc	300 mA	300 mA	300 mA
Power dissipation	23 watts	15 watts	23 watts
<b>Supply Voltage Ripple</b> (Pk-Pk from 60 Hz to 3 MHz)	<50 mV	<50 mV	<50 mV
<b>Control Format</b>	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB
<b>Phase Lock Alarm (P13) (TTL)</b>	1=Locked	1=Locked	1=Locked
<b>Weight</b>	15 oz / 426 g	15 oz / 426 g	15 oz / 426 g

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**MLSP Options:**

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

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

**Option C:** Internal Reference / No External Reference, Drawing 181-003 & 181-004

**Option D:** RF Connectors Front, Drawing 181-001

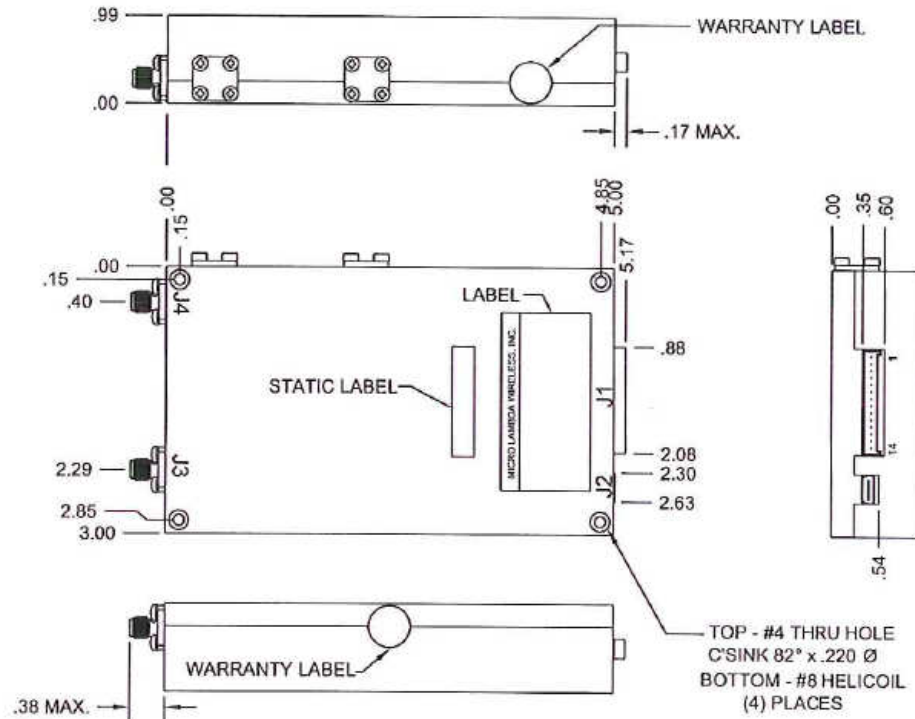
**Option E:** RF Connectors Side, Drawing 181-002

Part Number Example: MLSP-4214BD 4.2 GHz to 14.2 GHz with Internal Reference and RF connectors on front.

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**Notes:**

- 1) 50-100 MHz OCXO recommended for best phase noise performance. External reference directly effects phase noise performance.
- 2) Output phase noise performance is not dependent on external reference phase noise.
- 3) All values stated for units with external reference. For internal reference add 125mA on the +15 Vdc line.
- 4) Frequency accuracy must be within exact reference frequency selected, +/- 5ppm.



**NOTES :**

- J1 MALE: - MOLEX# 35363-1460
- J1 MATES WITH: - MOLEX# 35507-1400
- CRIMP PIN: - MOLEX# 50212-8000
- J1 POWER SUPPLY INPUTS REQUIRED FOR USB OPERATION
- J1 RECOMMENDED WIRE SIZE = A.W.G. 22-24
- (\*) ACTIVE LOW

CONNECTIONS			
CONN.	TYPE	PIN #	FUNCTION
J1	35363-1460	1	+15 VDC, +12V OPT.
J1	35363-1460	2	+15 VDC, +12V OPT.
J1	35363-1460	3	GROUND
J1	35363-1460	4	GROUND
J1	35363-1460	5	+ 5 VDC
J1	35363-1460	6	+ 5 VDC
J1	35363-1460	7	N/C
J1	35363-1460	8	N/C
J1	35363-1460	9	CLOCK
J1	35363-1460	10	DATA IN
J1	35363-1460	11	SELECT (*)
J1	35363-1460	12	BUSY
J1	35363-1460	13	LOCK ALARM
J1	35363-1460	14	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 ± .01 ± .015 ± .05	CONTRACT NO.	
	APPROVALS	DATE
WEIGHT 15 Oz. / 425gr	DRYVN	N.NGUYEN 3/12/12
	ENGR	DS 3/12/12
FINISH	MANUF.	
	QA	



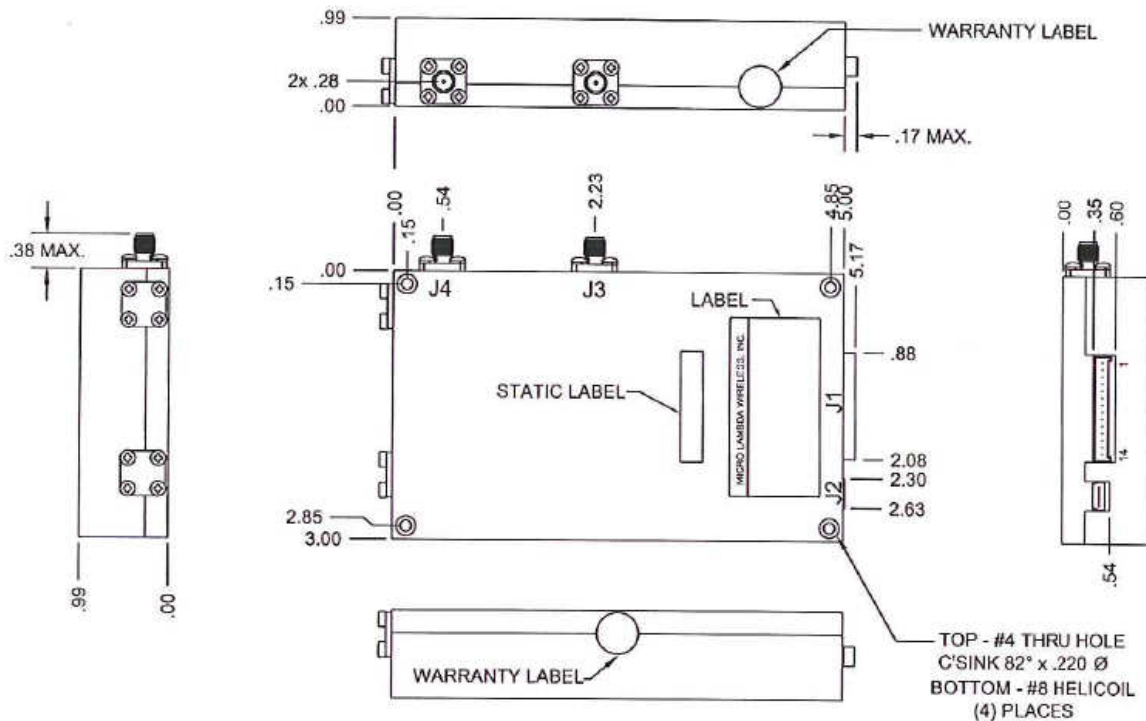
**MICRO LAMBDA WIRELESS, INC.**

**MLSP SYNTHESIZER, EXT. REF. ( FRONT )**

SIZE	CAGE No ORN63	DWG. NO	181 - 001	REV. B
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DO NOT SCALE DRAWING





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CONN.	TYPE	PIN #	FUNCTION
J1	35363-1460	1	+15 VDC, +12V OPT.
J1	35363-1460	2	+15 VDC, +12V OPT.
J1	35363-1460	3	GROUND
J1	35363-1460	4	GROUND
J1	35363-1460	5	+ 5 VDC
J1	35363-1460	6	+ 5 VDC
J1	35363-1460	7	N/C
J1	35363-1460	8	N/C
J1	35363-1460	9	CLOCK
J1	35363-1460	10	DATA IN
J1	35363-1460	11	SELECT (*)
J1	35363-1460	12	BUSY
J1	35363-1460	13	LOCK ALARM
J1	35363-1460	14	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  
 .015 ±.002 .010 ±.001 .010 ±.001  
 WEIGHT 15 Oz. / 425gr  
 FINISH  
 DO NOT SCALE DRAWING

CONTRACT NO.	
APPROVALS	DATE
DRAWN N. NGUYEN	3/12/12
ENGR DS	3/12/12
MANUF.	
QA	



MICRO LAMBDA WIRELESS, INC.

MLSP SYNTHESIZER, EXT. REF. ( SIDE )

SIZE	CAGE No	DWG. NO.	REV.
	0RN63	181 - 002	B