MICRO LAMBDA WIRELESS, INC.

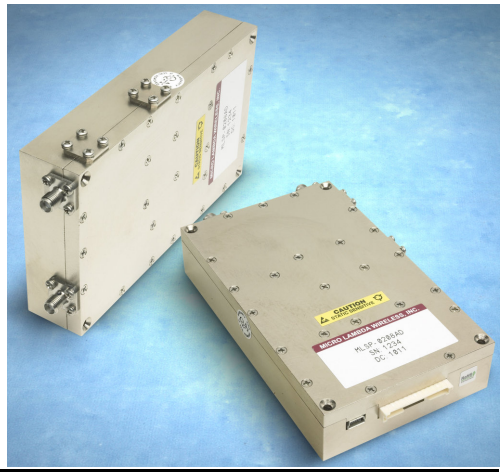
MLSP SERIES
WIDEBAND, LOW NOISE SYNTHESIZERS
600 MHz - 20 GHz (In Bands)

FEATURES

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

APPLICATIONS

Test Equipment
Local Oscillators
Frequency Converters



DESCRIPTION

The **MLSP-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 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 5 mSec. The units are 5" x 3" x 1" high and fit a 2 slot PXI chassis.

PERFORMANCE SPECIFICATIONS

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

Model No.	MLSP-0625	MLSP-2080	MLSP-6018	MLSP-8020
RF Specifications				
Output Frequency (Note 2)	0.6-2.5 GHz	2-8 GHz	6-18 GHz	8-20 GHz
Output Power Min. (Notes 6, 7 & 8)	+13 dBm	+13 dBm	+10 dBm	+8 dBm
Po Variation over Freq/Temp	4 dB	4 dB	6 dB	6 dB
Step Size, Min.	1 kHz	1 kHz	1 kHz	1 kHz
Switching Speed, 100 MHz Step, Typ.	1 mS	1 mS	1 mS	1 mS
1000 MHz Step, Typ.	3 mS	3 mS	3 mS	3 mS
Full Band Step, Typ.	5 mS	5 mS	6 mS	6 mS
Warm-up Time ("Lock") @ 0C (Minutes) (with Internal Crystal Reference)	3.0	3.0	3.0	3.0
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	-12 dBc	-12 dBc
Non-Harmonic Spurious				
100 Hz f off ≤500 kHz	-60 dBc	-60 dBc	-60 dBc	-60 dBc
>500 kHz	-80 dBc	-80 dBc	-80 dBc	-80 dBc
Phase Noise Performance				
(with Internal Crystal Reference)				
@ 100 Hz Offset	86 dBc/Hz	79 dBc/Hz	72 dBc/Hz	70 dBc/Hz
@ 1 kHz Offset	98 dBc/Hz	95 dBc/Hz	89 dBc/Hz	87 dBc/Hz
@ 10 kHz Offset	98 dBc/Hz	95 dBc/Hz	91 dBc/Hz	88 dBc/Hz
@ 100 kHz Offset	118 dBc/Hz	117 dBc/Hz	115 dBc/Hz	115 dBc/Hz
@ 1 MHz Offset	142 dBc/Hz	140 dBc/Hz	138 dBc/Hz	138 dBc/Hz

MLSP PERFORMANCE SPECIFICATIONS (Continued)

Model No.	MLSP-0625	MLSP-2080	MLSP-6018	MLSP-8020
Reference Oscillator Options				
Option A				
External Reference (Note 3)	1 - 200 MHz	1 - 200 MHz	1 - 200 MHz	1 - 200 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied
Option B				
External Reference with Internal Crystal (Note 4)	1 - 100 MHz	1 - 100 MHz	1 - 100 MHz	1 - 100 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability	Cust Supplied	Cust Supplied	Cust Supplied	Cust Supplied
Option C				
Internal Reference	100 MHz	100 MHz	100 MHz	100 MHz
Frequency Stability	+/- 1 PPM	+/- 1 PPM	+/- 1 PPM	+/- 1 PPM
Supply Voltage & Current (Note 5)				
+15 Vdc (± 0.5) Vdc)	525 mA	825 mA	1375 mA	1800 mA
+5 Vdc (± 0.25) Vdc)	300 mA	300 mA	300 mA	300 mA
Power dissipation	9.4 watts	13.9 watts	22.1 watts	28.8 watts
Supply Voltage Ripple (Pk-Pk from 60 Hz to 3 MHz)	<50 mV	<50 mV	<50 mV	<50 mV
Control Format	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB	5-Line Serial USB
Phase Lock Alarm (P13) (TTL)	1=Locked	1=Locked	1=Locked	1=Locked
Weight	15 oz / 426 g	15 oz / 426 g	15 oz / 426 g	15 oz / 426 g

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
Option F: Fixed power level >0 dBm, level flatness +/- 1.0 dB, +/- 0.25 dB typ. Degrades max. RF output power by 4-6 dB when implemented.
Option G: RF Power Leveling (-20dB Delta from attained power level (i.e. +10 to -10 dBm), in 0.1dB increments). Degrades max RF output power by 4-6 dB when implemented. Changes RF Phase up to 160° versus freque ncy and attenuation.
Option H: Higher RF Power level available, (4 dB improvement).
Option J: Internal Reference with Reference Output (100 MHz @ 0 dB ± 3 dB, ± 1 PPM), Drawing 181-005 & 181-006

Part Number Example: MLSP-8020CE 8 GHz to 20 GHz with Internal Reference and RF connectors on side.

Notes:
1) Special operating temperature range available.
2) Special 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) All values stated for units with external reference. For internal reference add 125mA on the +15 Vdc line.
6) Higher power levels available (Option H). Add 100 mA on the +15 Vdc line.
7) Improved level flatness fixed output level (Option F).
8) RF Power level control, adjustable over a 20 dB range in 0.1 dB increments (Option G). Level flatness specified @ 25 ℃ ± 10 ℃.