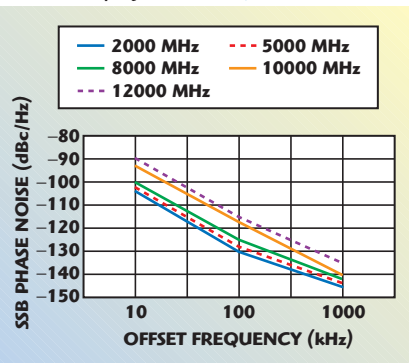




AN EIGHT-CHANNEL YIG-TUNED FREQUENCY SYNTHESIZER ARRAY

Low phase noise is a staple of modern communication systems signal sources. For that reason system designers prefer yttrium iron garnet (YIG)-based sources. In addition, many of today's communications systems are required to operate at multiple frequency bands, while still maintaining low phase noise performance. To address these needs, a new YIG-based frequency synthesizer array has been introduced that provides up to eight independent frequency channels in a single 19" rack enclosure.

Fig. 1 Single-sideband phase noise performance. ▼



The MLSA-series frequency synthesizer arrays are designed to be the main local oscillators in simulation systems, communications systems and test sets. They are comprised of up to eight independent YIG-based phase-locked loop (PLL) synthesized channels that are 2 to 3 GHz wide up to 12 GHz. Each channel has a standard resolution of 500 kHz, both in the narrow band and wide band

models. Optional frequency resolution to 125 kHz can be provided by simple programming via a RS232 standard interface with a 19,200-baud rate.

The synthesizer array delivers between +8 and +12 dBm output power depending on the frequency band of operation with maximum output power variations of ± 2 dB due to temperature and frequency. Optional dual RF output ports for each independent frequency channel are available thus providing 16 RF outputs in a single 19" rack enclosure.

The harmonic levels of this multi-octave source are moderately controlled at -12 to -15 dBc. However, the spurious levels are held to better than -60 dBc for all frequency offsets. In addition, the phase locked phase noise is excellent. As shown in **Figure 1**, single-sideband (SSB) phase noise for a single channel from 8 to 10 GHz is -93 dBc/Hz for a 10 kHz offset from the carrier, -117 dBc/Hz for a 100

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PRODUCT FEATURE



▲ Fig. 2 The array synthesizer's rear panel.

kHz offset and -140 dBc/Hz for a 1 MHz offset; it continues downward to a noise floor below -155 dBc/Hz. The MLSA-1100 series synthesizer arrays can also be provided with an optional internal, high performance 10 MHz crystal reference oscillator and/or an optional microwave switch for turning frequency bands into a single output.

Powered by 120/240 V AC, the synthesizer array draws 300 mA at +120 V AC for a dual band array and 1200 mA for an eight-band array. The unit is supplied in a standard rack enclosure measuring $19" \times 15" \times$

3.5" high with female SMA connectors for the RF outputs. An SMA connector is provided for the external reference supplied by the user and a nine-pin connector is included for the RS232 communication lines, as shown in **Figure 2**. A fault/lock indicator circuit is also supplied. The synthesizers are designed to operate into a maximum SWR of 1.50 and handle operating temperatures from -0° to $+55^\circ$ C. **Table 1** lists the available 2 GHz tuning range models in

the series. Additional information may be obtained via e-mail at sales@microlambdawireless.com. The new synthesizers are available for delivery eight weeks after receipt of order.

TABLE I

**MLSA-SERIES OF 2 GHz
TUNING RANGE SYNTHESIZERS**

Model	Frequency Range (GHz)	Channel
MLSA-1108-001	2.0 to 4.0	1
	4.0 to 6.0	2
	5.0 to 7.0	3
	6.0 to 8.0	4
	7.0 to 9.0	5
	8.0 to 10.0	6
	9.0 to 11.0	7
	10.0 to 12.0	8
MLSA-1104-001	2.0 to 4.0	1
	4.0 to 6.0	2
	5.0 to 7.0	3
	6.0 to 8.0	4
MLSA-1102-001	2.0 to 4.0	1
	4.0 to 6.0	2

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