

Product Features

- Solid state design using GaN devices
- Ideal replacement for TWT amplifiers used in SATCOM applications
- Phase combined to provide up to 2 kW of saturated power
- Fully protected against temperature, input overdrive, output overdrive and output load VSWR conditions
- Integrated modular AC/DC power supply
- Forced liquid cooled
- Built in LCD display for easy navigation and control
- Local/remote monitoring and control via Ethernet and RS485 interfaces
- Dual-redundant configuration (optional)
- Integrated linearizer (optional)
- ALC circuit with ± 0.25 dB accuracy (optional)
- Full turnkey solution with pump system and heat exchanger available (optional)



Product Description

UBS' L/S-Band solid state power amplifier (SSPA) system is built using the latest GaN transistor technology. The highly efficient design is the ideal replacement for TWTAs used in SATCOM applications. It offers up to 2kW of saturated power with maximum reliability and long service life.

The modular design includes SSPA modules, a passive combining/switching network with filter and a system controller. A power supply system with PDU and hot-swappable AC/DC power supplies is also included. The scalable system can be customized to operate with 1, 2 or 4 phase combined SSPA modules, and can be updated in the field as output power requirements change.

The system can be configured to operate in the standard 1+1 combined mode or optional 1:1 redundant mode with a passive combing/switching, which is employed to avoid interruptions in the RF output power. The AGC circuit maintains a constant gain value, with ± 0.25 dB accuracy over the life of the system; an ALC circuit with constant output power level is optional. Optionally, an integrated linearizer which ensures the systems operate at maximum power without seeing a degradation in intermodulation performance.

The UniMatrix systems also feature a number of monitoring and self-protection circuits including input overdrive, forward power, reflected power and over temperature. The system controller provides a user friendly interface for monitoring and control of the complete UniMatrix system as well as the individual SSPA modules. A front panel display provides the user with local monitoring and control, while Ethernet and RS485 interfaces provide the user with local/remote monitoring and control via PC GUI and Web GUI, SNMP optional.

UniMatrix L/S-Band 2kW GaN Solid State Power Amplifier System



Product Specifications

Available GaN Module Power Levels			
	1-Module System	2-Module System	4-Module System
Saturated Power (P_{sat})	500 W (57 dBm)	1000 W (60 dBm)	2000 W (63 dBm)
Small Signal Gain	75 dB typ.	75 dB typ.	75 dB typ.
Power Consumption	2.5 kW max.	5.0 kW max.	10.0 kW max.

Electrical							
Operating Frequency	1.5 to 3.0 GHz (other frequency options available)						
Saturated RF Output Power (P_{sat})	See above table						
Small Signal Gain	See above table						
Small Signal Gain Flatness	± 2.5 dB across entire band						
Small Signal Gain Slope	± 0.8 dB across any 40 MHz band						
Output Power Stability	± 0.5 dB across entire band						
Gain Variation vs. Temperature	± 0.5 dB over operating temperature range						
Gain Adjustment	0 to 30 dB, step size 0.1 dB						
Phase Noise	10 dB below IESS-308/309						
Third Order Intermodulation (2-tone, 5 MHz spacing)	-30 dBc max. @ 5 dB backoff						
Harmonics	-25 dBc max. from 1.8 GHz to 3.0 GHz (without output filter); -55 dBc max. across entire band (with output filter)						
Spurious	-60 dBc max.						
Group Delay (over any 40 MHz band)	<table border="0"> <tr> <td style="padding-right: 20px;">Linear</td> <td>0.01 ns/MHz max.</td> </tr> <tr> <td>Parabolic</td> <td>0.003 ns/MHz² max.</td> </tr> <tr> <td>Ripple</td> <td>1.0 ns pk-pk max.</td> </tr> </table>	Linear	0.01 ns/MHz max.	Parabolic	0.003 ns/MHz ² max.	Ripple	1.0 ns pk-pk max.
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Parabolic	0.003 ns/MHz ² max.						
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Input Return Loss	15 dB typ.						
Output Return Loss	17 dB typ.						

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Product Specifications

Interfaces	
RF Input	N-type (female)
RF Output	1-5/8" (female)
RF Output Sample	N-type (female)
System SSPA Module	N-type (female)
AC Input	Screw down terminal block (single phase, neutral and ground)
Monitoring and Control	
Ethernet Interface Protocol	RJ45 PC GUI, Web GUI and optional SNMP
RS485 Interface Protocol	DB-9 (female) PC GUI
Touch Screen LCD Protocol	Master Controller Front Panel SVG Web GUI

Power Supply	
Voltage	Single phase, 210 to 240 VAC, $\pm 10\%$
Frequency	50 to 60 Hz
Power Factor	0.98

Mechanical	
Package	One (1) 19", 40RU, indoor rack mount cabinet with waveguide combining/switching network
Dimensions (W x H x D)	55.9 x 218.4 x 106.7 cm (22 x 86 x 42 inches), cabinet only

Environmental	
Ambient Operating Temperature	0°C to +50°C
Ambient Storage Temperature	-50°C to +85°C
Relative Humidity	5% to 95%, non-condensing @ +40°C
Altitude	3000 m (10000 ft.)
Cooling	Forced liquid with pump system and heat exchanger. Flow rate of 3 gallons/minute per SSPA is required.

UniMatrix L/S-Band GaN Solid State Power Amplifier System



Part Number Configuration

