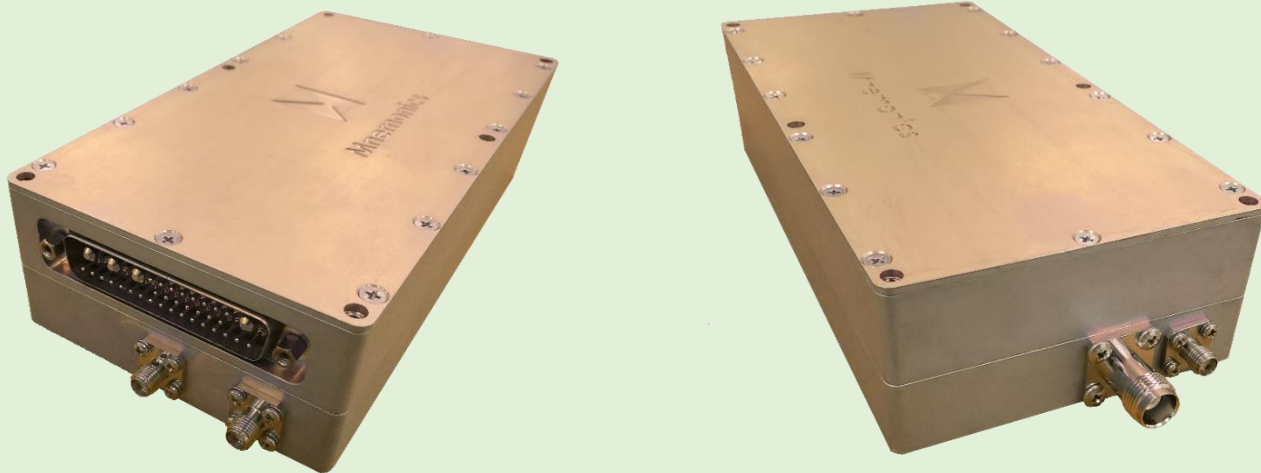




## SOLID STATE POWER AMPLIFIER

### 50-Watt Amplifier

### 2 to 6 GHz



#### Description

Mnemonics 50-Watt Solid State Power Amplifier (SSPA) is a wide band, highly efficient power, highly linear RF amplifier that covers the 2 to 6 GHz frequency band with an instantaneous bandwidth in excess of 100 MHz. It is powered by standard 28 VDC power at 11 Amperes maximum current.

The 50-Watt SSPA high gain, high power, high bandwidth functionalities are achieved by using a number of Gallium Nitride (GAN) devices and 90-degree hybrid couplers. The SSPA uses an on-board microcontroller that monitors DC power and R-485 communications to the host radio system. The SSPA uses a sub-D connector for the RS-485 interface and 28 DC volts supply line. The SSPA has 2 RF inputs (SMA connectors) thereby allowing the use of two input radios one at a time with input selection provided through the RS-485. The SSPA output is provided through a standard TNC Type of RF connector.

Each of the high-power GAN devices are independently biased with independent temperature compensation for gain flatness over temperature. The 50-Watt SSPA has RF detectors at its input and output ports. The output port uses a high power wideband bi-directional coupler such that both reverse and forward powers are measured. The RF detectors feed the signal levels to the microcontroller and gain flatness over frequency and over temperature is maintained.

#### Summary/Application

- Fixed-wing aircraft and ground vehicle applications
- Flexible design supports frequency ranges up to 6GHz
- Dual Radio Frequency (RF) inputs
- Compact size
- High efficiency
- Wide bandwidth supports a greater spectrum of radios

#### Specifications/Highlights

- Frequency: 2 GHz to 6 GHz
- Operating Temperature: -40 °C to +85 °C
- Altitude: 65,000 feet
- Vibration: MIL-STD-810, Method 514, Procedure 1
- Shock: MIL-STD-810, Method 516, Procedure 1
- Humidity: <IL-STD, Method 507, 4 – 48-hour cycles
- EMI/EMC: MIL-STD-461F, RE102, CE102

### Mnemonics 50-W Solid State Power Amplifier

Parameter	Specification	
<b>Frequency</b>	<b>2 GHz to 6 GHz</b>	
Frequency	2.0 GHz to 4 GHz	4.0 to 6 GHz
Input Level	-10 dBm to 0 dBm	-10 dBm to 0 dBm
Input/Output Impedance	50 Ohm	50 Ohm
<b>POWER/EFFICIENCY</b>		
DC Power Supply	28 Volts, 5.36 Amps max (150 W)	28 Volts, 8.9 Amps max (250 W)
Efficiency	30% @ 50 W	20% @ 50 W
Output Power	50 W CW	50 W CW
Saturated Output Power (PSAT)	60 W	56 W
Heat Dissipation	150 W	200W
<b>RF PERFORMANCE</b>		
Gain @ +25°C	58 dB	58 dB
Gain @ 0°C	Gain @ +25 °C ± 0.5 dB	Gain @ +25 °C ± 0.5 dB
Gain @ +50°C	Gain @ +25 °C ± 0.5 dB	Gain @ +25 °C ± 0.5 dB
Gain change over any 60MHz band	± 0.50 dB	± 0.50 dB
Gain over frequency	± 1.50 dB for 2.0-4.0 GHz	± 2.00 dB for 4.0-6.0 GHz
Harmonics	< -12 dBc	< -12 dBc
Spurious	< -65 dBc	
Intermodulation Distortion (IMD)	-30 dBc two 10 W tones, 1 MHz spacing	
Input Voltage Standing Wave Ratio (VSWR)	1.5:1 @ 50 Ohms	
Input Return Loss	> 14 dB	
Output Voltage Standing Wave Ratio (VSWR)	2:1 @ 50 Ohms	
<b>FEATURES</b>		
Bias Supply (V Key Line)	N/A	
Load Protection	Power backoff or shut down if no Output Load	
Thermal Shutdown Temperature	Over-Temp Threshold set by resistor value (e.g., + 95° C)	
Input Overload Protection	Hardware limited at < 16 dBm	
Dual Radio Frequency (RF) Inputs	Input Selectable by RS-485 Command (Chan 0 is default)	
<b>PHYSICAL</b>		
RF connectors	Input: 3 SMAs Output: 1 TNC	
Direct Charge (DC) Connector	D-Sub-36W4 (mixed signal pins)	
Size (with no heat sink)	6.75" x 3.5" x 1.6"	
Weight	< 2.5 lbs	
<b>ENVIRONMENTAL</b>		
Operating Temperature	-40 °C to +85 °C	
Altitude	65,000 feet	
Vibration	Designed to meet MIL-STD-810, Method 514, Procedure 1	
Shock	Designed to meet 40 G, 11 msc half-sine, 3 axes, MIL-STD-810, Method 516, Procedure 1	
Humidity	Designed to meet MIL-STD-810, Method 507, 5-48 hr cycles	
Electromagnetic Interference/Compatibility (EMI/EMC)	Designed to meet MIL-STD-461F, RE102, CE102	