

Microwave Power Modules

For Military and Commercial Applications



communications

Electron Devices

Electron Devices' MPMs for Military and

The Microwave Power Module (MPM) is a recent advancement in medium power microwave amplifiers. The MPM is a complete microwave amplifier that includes a miniature helix traveling wave tube (TWT), a solid-state driver amplifier (SSA), and a high density electronic power conditioner (EPC). All three components are housed in a small, compact, lightweight package. Compared to traditional TWT amplifiers, the MPM is significantly smaller, lighter, more

efficient, and has a greater signal-to-noise ratio. Both military and commercial versions are available.

MPMs have been developed to operate from 2 GHz to over 45 GHz. The standard wideband MPMs operate from 2 to 8 GHz, 6 to 18 GHz, and 26 to 40 GHz. Narrowband MPMs operate in the C, X, Ku, Ka, and Q-bands.

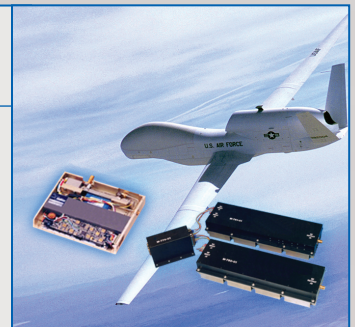
MPMs for Military Applications

Highlights

- Can be optimized for narrowband applications
- RF output power of up to 125W available on select models
- Integral Equalizer available on select models
- Optional Solid State Driver
- 270 VDC, 28 VDC, or 115 VAC 3 phase prime power
- Pulse Modulator included on all models
- Package Size as small as 50 cubic inches
- Greater than 25% efficiency

Product Information

MPM Type Number	Frequency Range (GHz)	RF Output Power (W)	Dimensions (inches)	Weight (lbs)	Input Voltage
M1220	6.0 to 18.0	60 to 100	7.5 x 6.25 x 1.0	3.75	270
M1221	6.0 to 18.0	60 to 100	7.8 x 7.5 x 1.25	4.0	28
M1231	12.75 to 14.5	80	7.5 x 6.25 x 1.0	3.75	270
M1232	12.75 to 14.5	75	7.5 x 6.2 x 1.6	4.5	115/208
M1270	X-Band	1 kW pulsed	11.0 x 6.0 x 2.0	9.0	28
M1282	26.0 to 40.0	20	7.5 x 8.5 x 1.25	6.0	28



Common Specifications

Duty	0 to 100% (CW)
Pulse Width	100 nsec to CW
PRF	50 kHz (max)
Rise Time	30 nsec (max)
Spectral Purity (Phase Noise)	-45 dBc (max) unsynchronized -60 dBc (max) synchronized >250 kHz from carrier
Spurious	-45 dBc (max)
Intermodulation	-21 dBc (max) at 7 dB backoff
Turn-On Delay	
Heater	2 minutes (max)
High Voltage	100 msec (max)
Modulate	150 nsec (max)
Load VSWR	
Operating	1.5:1 (max)
No Damage	4.0:1 (max) C, X and Ku 3.0:1 (max) Ka
Controls	Standby/Operate RF On Power Supply Sync (Optional)

Temperature Baseplate / Ambient

-54 to +85°C (typ)

Cooling

Conduction

Monitors and Indicators

Warm-Up Indicator
Helix Current Monitor
High Voltage Indicator
Fault Indicator

Altitude

Operating 50,000 feet
Non-Operating 70,000 feet

Humidity

Up to 100%, no condensation

Salt-Fog

MIL-STD-810E, Method 509.3

Vibration

MIL-STD-810, Method 514.4
80-350 Hz, 0.04 g²/Hz
-3 dB/octave 20-80 Hz
-3 dB/octave 350-2000 Hz

Shock

MIL-STD-810, Method 516.3
20 g's, 11 msec

Acceleration

MIL-STD-810, Method 513.3, 10 g's

Commercial Applications

With RF performance up to 125 W continuous wave (CW) output power, noise figures of less than 10 dB, and up to 40% efficiency over narrowband applications, MPMs have found use in a variety of military and commercial applications such as data links for unmanned aerial vehicles, satellite communications, radar illuminators and electronic countermeasures.

L-3 Electron Devices has designed the MPM to be modular. Users require a variety of mechanical formats to meet systems needs, and the use of modularity allows the components within the MPM to be reconfigured to a variety of form factors.

It is this flexible packaging, coupled with the small size, low noise, high efficiency, wide bandwidth, and high output power that makes MPMs the ideal choice for power amplifier requirements.


MPMs for Commercial Applications

Highlights

- Optimized for SATCOM bands (X, Ku, and Ka)
- RF output power of up to 125 W available on select models
- Integral Linearizer available on select models
- Optional Solid State Driver
- Optional AC input with power factor correction
- Optional Pulse Modulator available on select models
- Package size as small as 200 cubic inches
- Greater than 25% efficiency

Product Information

MPM Type Number	Frequency Range (GHz)	RF Output Power (W)	Dimensions (inches)	Weight (lbs)
M1000	2.0 to 8.0	50	12.0 x 10.5 x 2.0	12.0
M1020	6.0 to 18.0	60	10.3 x 9.6 x 2.0	10.0
M1025	12.75 to 14.5	80	10.3 x 9.6 x 2.0	10.0
M1040	26.0 to 40.0	20	12.0 x 10.0 x 2.0	12.0



Common Specifications

Prime Power	90 – 260 VAC, 50/60 Hz	Monitors and Indicators	Warm-Up Indicator Helix Current Monitor High Voltage Indicator Fault Indicator
Spectral Purity (Phase Noise)	-50 dBc (max) >10 kHz from carrier	Cooling	Conduction
Intermodulation	-24 dBc at 7 dB backoff (max)	Temperature	Baseplate/Ambient -30° to +55°C Baseplate (under collector) -30° to +70°C
Heater Turn-On Delay	2 minutes (max)	Altitude	Operating 15,000 feet Non-Operating 70,000 feet
Load VSWR	Operating 1.5:1 (max) No Damage 4.0:1 (max) X and Ku 3.0:1 (max) Ka	Humidity	Up to 95%, no condensation
Controls	Standby/Operate RF On	Vibration	0.1g ² /Hz from 5 to 20 Hz 0.02g ² /Hz from 20 to 2 KHz

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