

PTX8100

Broadband Microwave Power Module



The PTX8100 **Microwave Power Module** family integrates a "Super Mini" Travelling Wave Tube (TWT), solid state preamplifier and an optimised high density switch mode power supply to produce a single "drop-in" microwave amplifier block.

Integration of TWT and Power supply simplifies the system designers task by eliminating TWT interconnections (and their associated safety and reliability hazards). Integration further reduces the overall system size, simplifying the installation task.

The MPM is factory adjusted to optimise TWT performance. No user adjustments are required, simplifying replacement and reducing replacement times in the field.

The MPM can be configured to incorporate a variety of TWT models, allowing the user to specify frequency and peak power parameters.

The initial family member features a broad band (6 to 18 GHz) TWT capable of providing 65 W CW over this frequency range and 100 W from 7 to 11 GHz. A low gain TWT is specified together with a low noise Solid State Preamplifier to provide optimum noise performance.

The MPM includes a high speed focus electrode modulator to permit operation at high PRFs. This makes the MPM ideal for pulsed applications such as ECM and Radars.

In addition to very small size and light weight, the unit features excellent thermal management. High electrical efficiency requires minimum cooling and provides high reliability service over a wide temperature range.

By virtue of the fully encapsulated high voltage section, the unit can operate at high altitudes and high humidity.

A control interface is incorporated which allows remote operation and status monitoring, providing diagnostic outputs for BIT purposes.

These Microwave Power Modules are fully tested to agreed acceptance test procedures before shipment, meeting the demands of high performance Radar and ECM systems.



RF CHARACTERISTICS

Typical Operating Characteristics for the MPM incorporating a 6 to 18 GHz, 100 W TWT ^{Note 1}

Frequency Range

6.0 to 18.0 GHz

RF Output Power (Saturated)

100 W (+50 dBm) (7 to 11 GHz)

63 W (+48 dBm) (6 to 18 GHz)

Duty Cycle

100% max

Small Signal Gain

58 dB Nom

RF Input Power (for saturation)

0 ± 1 dBm

Second Harmonic at saturation

-8 dBc (at 6 GHz)

-14 dBc (at 7 GHz)

-16 dBc (at 8 GHz)

Noise Power Density (Beam On)

-30 dBm/MHz max

Noise Power Density (Beam Off)

-80 dBm/MHz max

Maximum spurious PM

measured in a 100 Hz bandwidth
(CW operation) ^{Note 2}

-50 dBc

Noise Figure

11 dB

Input VSWR

2.0:1 Max

Output VSWR

2.5:1 Max (No damage)

Pulsewidth

0.1 to ∞ μs (CW Operation)

Pulse Delay (ON command to RF Out)

130 ns max, 100 ns typical

RF Pulse Rise time

20 ns max, 10 ns typical

Pulse Repetition Frequency (PRF)

100 kHz max

Notes:

- 1 Other Characteristics are available to special order
- 2 Lower spurious values are achievable for close to carrier noise using sync function

PRIME POWER REQUIREMENT

Prime Power

270 V DC Per MIL-STD-704E (±10% normal operating range)

Power Consumption (CW operation)

430 W max, 350 W typical

Efficiency (RF Out, prime power)

30% at band edges

CONNECTORS

Primary Power Input Connector

M38999/20WB98PN (to MIL-C-38999 Ser III)

Control and Monitoring Connector

M38999/20WC35SN (to MIL-C-38999 Ser III)

RF Input Connector

SMA Female

RF Output Connector

TNC Female

CONTROL AND MONITORING

Control Inputs

HV On

TWT Beam On

Status Outputs

Standby

HV On

Fault

Fault Protection

Extensive internal BIT incorporated to monitor most TWT parameters. MPM shuts down under fault conditions. TWT operating parameters can be monitored externally to aid fault location.

An overtemperature trip is incorporated.

Fault Outputs

Overtemp

Prime Power

TWT Monitor Outputs

Cathode Voltage

Beam Current

Helix Current

Heater Warmup

60 Seconds from power on

Automatic Restart

Auto-reset after fault is available as an option.

MECHANICAL

Mechanical Outline

250 x 200 x 32 mm excluding connectors

Weight

3.2 kg max

Orientation

Any

Finish

Alochrom 1200

Markings/Labels

Type Number

Model Number

Serial Number

Connector Ident.

Hazard Warning

Cooling

Conduction via baseplate, +85 °C maximum temperature

ENVIRONMENTAL

Ambient Temperature (operating)

-40 ° to +85 °C

Ambient Temperature (Non operating)

-54 ° to +100 °C

Baseplate Temperature (MPM)

85 °C maximum (operating)

Altitude (Operating)

0 - 70,000 ft

Vibration (Operating - 3 axes)

0.2 g²/Hz 10 to 40 Hz

0.04 g²/Hz 40 to 2000 Hz

Shock (3 axes)

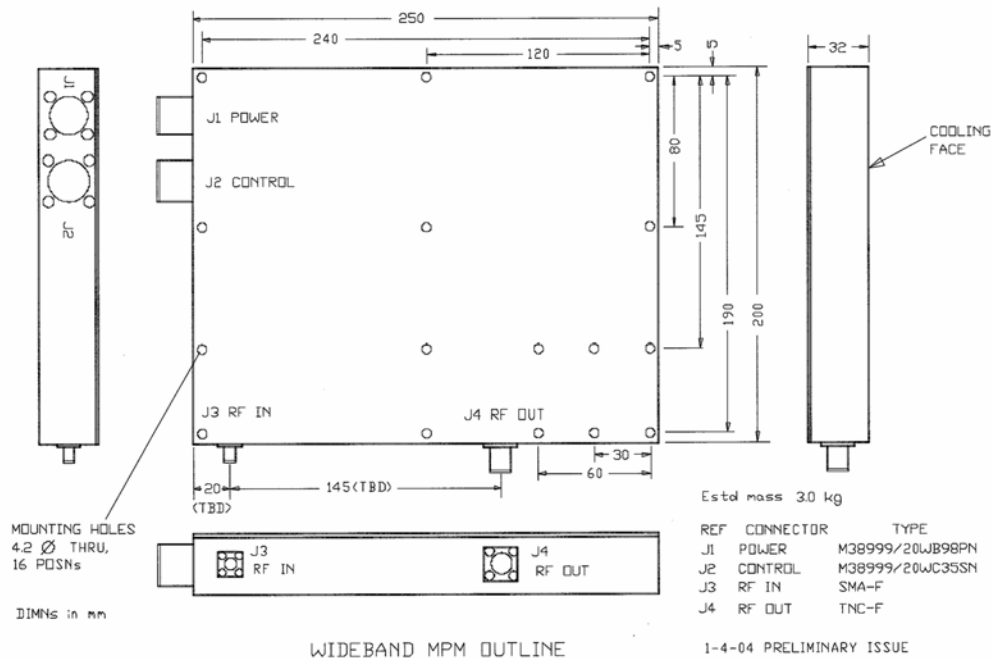
40 g , 6 ms half sine

Humidity (Condensing)

MIL-STD-810D Method 507.2 Procedure II

EMC Performance

MIL-STD-461E



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