

Communications & Power Industries - Microwave Power Module

The PTXM9754 is an ultra compact modular Microwave Power Module with an integrated “Super Mini” Travelling Wave Tube (TWT), a 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 designer’s 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 PTXM9754 features a broad band (6.0 to 18 GHz) TWT capable of providing 100 W CW across the band. 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.

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



The PTXM9754 is an ultra compact modular Microwave Power Module with an integrated “Super Mini” Travelling Wave Tube (TWT)

FEATURES:

- In addition to a 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.

BENEFITS:

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

APPLICATIONS:

- 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 100W 6.0 to 18 GHz TWT ^{Note 1.}

Frequency Range	6.0 to 18.0 GHz
RF Output Power (Saturated)	100W minimum (+50.0 dBm) (6.0 to 18.0 GHz)
Duty Cycle	100% max
Small Signal Gain	63 dB nom, 58dB min, 70dB max
RF Input Power (for saturation)	0 ± 1 dBm
Second Harmonic at saturation	
-3 dBc max	(from 6.0 GHz)
-6 dBc max	(from 7.5 to 10.0 GHz)
-10 dBc max	(from 10.0 to 18.0 GHz)
Noise Power Density (Beam On)	-32 dBm/MHz max
Noise Power Density (Beam Off)	-110 dBm/MHz max
Maximum spurious PM measured in a 100 Hz bandwidth	-45 dBc
Phase Noise Power Density	
-100 dBc/Hz max at 1 kHz from carrier	
-110 dBc/Hz max at 10 kHz from carrier	
-120 dBc/Hz max at >100 kHz from carrier	
Noise Figure	15dB (typical)
Input VSWR	2.0:1 max
Output VSWR	2.5:1 max

Load VSWR	2.0:1 max (No damage)
Pulse Width	0.1 to ∞μs (CW Operation)
Pulse Delay (ON command to RF Out)	150 ns max
Pulse Repetition Frequency (PRF)	30 kHz max

Prime Power Requirements

Prime Power	28 V DC Per MIL-STD-704E
Power Consumption	540 W maximum

Connectors

Primary Power Input Connector	D-sub, male, 15-way
Control and Monitoring Connector	D-sub, female, 15-way
RF Input Connector	SMA Female
RF Output Connector	TNC Female

Control and Monitoring

Control Inputs	HV ON RF ON BATTLE OVERRIDE
Status Outputs	HV OK FAULT WARMED UP

Notes:

1 Other Characteristics are available to special

Fault Protection

Internal Built-in Test incorporated to monitor most TWT parameters and trip at collector overtemperature. MPM shuts down under fault conditions. Helix current can be monitored by the end user to aid TWT troubleshooting.

TWT Monitor Outputs

Heater Warmup	180 Seconds from power up
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Automatic Restart	Auto-reset after fault is included (3 restarts).
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Mechanical

Mechanical Outline

203.2 x 196.85 x 35.6mm excluding fixings and connectors -45 dBc

Weight	2.6 kg max
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Orientation	Any
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Finish	Nickel plated
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Markings/Labels	Type Number Model Number Serial Number Connector Ident. Hazard Warning
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Cooling	Conduction, via base-plate; +85°C maximum collector temperature
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Options (available on request)

Alternative prime power: 270V DC, 115V AC 60Hz

Alternative monitor outputs: TWT Overtemp, Cathode voltage, Standby indicator

Additional control inputs: PSU sync signal

Environmental

Ambient Temperature (operating)	-25 to +85°C
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Ambient Temperature (Non-operating)	-40 to +100°C
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Baseplate Temperature (MPM)	85°C maximum (operating)
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Altitude (Operating)	0 - 10,000 ft
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Vibration (Operating - 3 axes)	0.04 g ² /Hz 40 to 2000 Hz -6dB/octave 1000 to 2000 Hz
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Shock (3 axes)	20 g, 11 ms half sine
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Humidity	90%, non-condensing
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EMC Performance	MIL-STD-461E- Requires external EMC filter
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For more detailed information, please refer to the corresponding technical description if one has been published, or contact CPI TMD Technologies. Specifications may change without notice as a result of additional data or product refinement. Please contact CPI TMD Technologies before using this information for system design.

TMDUK-SALE-9151 Issue A dated Oct 2018