

**SPECIFICATION FOR PTCM2204 / PTCM2304,  
6.5 – 18.0 GHZ, 2.0KW PULSED  
MODULAR INSTRUMENTATION AMPLIFIER**

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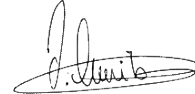
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**AMENDMENT RECORD**

<b>Issue Number</b>	<b>Date</b>	<b>Description</b>
1	February 2022	Initial Issue

**Associated/Reference documents**

Reference should also be made to the following documents:

<b>Document Number</b>	<b>Issue Number</b>	<b>Description</b>

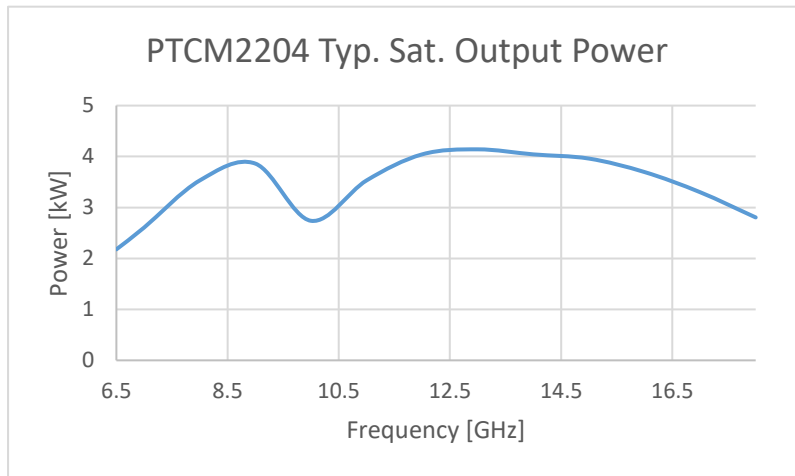
The PTCM2204/PTCM2304 is a High power Dual combined pulsed broadband Travelling Wave Tube (TWT) Amplifier with high efficiency, wide instantaneous bandwidth and high gain when compared with solid state amplifiers.

For high availability user applications including EMC / Radiated Immunity testing, Communications, EW, Radar, RF Component Testing and scientific applications.

Continuing with TMDs heritage in ultra-reliable amplifiers, we have now improved the capability of our amplifiers through built in self-test, advanced fault diagnostics, modular, plug and play, field replaceable PCBs and Ethernet remote control and monitoring. This product now offers unparalleled availability to the end user. A combination of standard but customisable 12U chassis units and “soft” re-configurable control system enables many options to be easily and quickly configured.



Example PTCM: Can be supplied with or without LCD screen



- Rugged, ultra-reliable design
- Advanced Self-Diagnostics
- Ethernet interface - Graphical User Interface to run on any PC or laptop with a standard browser
- Remote Management and diagnostics
- RF forward sample port available as standard
- ISO9001 Accredited Quality Assurance

## RF Specifications

	Min	Typ	Max	Unit
<b>Frequency</b>	6.5		18.0	GHz
<b>Peak Output Power</b>	6.5 – 7.5 GHz	2.0		kW Pulse
	7.5 – 18.0 GHz	2.6		
<b>RF Input Amplitude</b>		5	10	dBm
<b>Fwd Power Monitor</b>		-50		dB
<b>Load VSWR*</b>			3:1	ratio
<b>Reverse Power Protection</b>		25%		Full Power
<b>Spurious</b>		-50	-30	dBc
<b>Harmonics</b>		-12	-2	dBc
<b>Pulse Rise/ Fall Time</b>		50	100	ns
<b>Pulse Propagation Delay</b>		200	300	ns
<b>Beam ON Noise</b>		+2	+3	dBm/MHz
<b>Pulse Width</b>	PTCM2204	0.2	50	µs
	PTCM2304	0.2	100	
<b>PRF</b>		0	100	kHz
<b>Duty Cycle</b>		0	6	%

\* Note: The maximum Load VSWR is the trip level for damage protection when operated at full power. For full performance TMD recommends load VSWR of 1.5:1 or better. Operating at high power with poorly matched loads for sustained periods may cause damage to the TWT. If a good match is not possible TMD recommends the use of an external isolator. Contact TMD for a quotation.

## Mechanical

Parameter	Value
<b>Width</b>	19" Front panel
<b>Height</b>	12U Front panel height
<b>Depth</b>	800 mm, excluding handles (provision for external EMC shield at rear)
<b>Weight</b>	110 kg ±5%
<b>Cooling</b>	Integral forced air cooling – air entry front and exit rear

## RF and Interface connections

Parameter	Value
RF Input Connector	Type: N Female, 50 Ohm
RF Sample Port	Type: N Female, 50 Ohm, nominally -50dB wrt. RF output
RF Output Connector	Type: WRD650 Waveguide
RF Modulation Input	Type: BNC Female, 5V TTL
Ethernet Input	RJ45

## Electrical Specification

	Single Phase	Three Phase
Input Voltage	220 - 240 V ±10%	208 V <sub>LL</sub> ±10%*
Frequency	50/60 Hz	50/60 Hz
Operating Current	Typ: 10 A, Max: 13 A	Typ: 3.9 A, Max: 4.4 A
Power Consumption	Typ: 2.2 kW, Max 2.5 kW	Typ: 1.3 kW, Max 1.5 kW

\* V<sub>LL</sub> is defined as the voltage across two electrical phases

## Environmental

Parameter	Value
Vibration	Military Standard 810G- Transport
Operating Temperature	0°C to +40°C
Non-Operating Temperature Limit	-10°C to +50°C
Humidity	80% maximum, non-condensing

## Protections

The amplifier has advanced TWT and power supply protection,

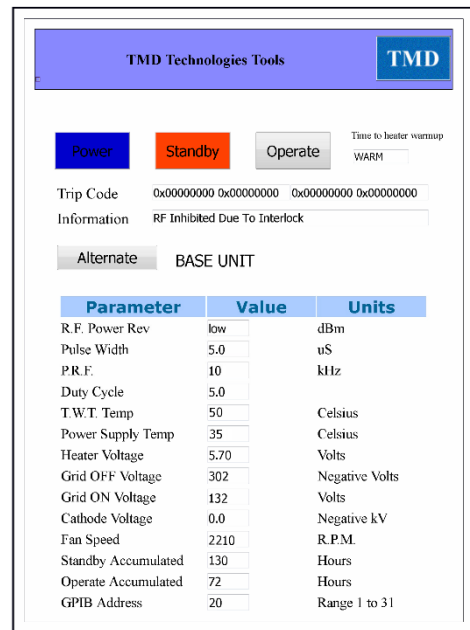
- Heater, Grid and Cathode Power Supply voltage continual monitoring
- VSWR Protection – unit will trip if reverse power exceeds 25% of max rated power
- TWT Current and Voltage Protection
- TWT Arc Protection
- TWT and PSU Over Temperature
- Standby and Operate Accumulated Hours
- Input Modulation Limit Check on Pulse Width, Pulse Repetition Frequency and Duty Cycle

## Remote Interface and/or Integral LCD Screen

The web-page based interface shows every parameter on a single page with no need for sub menus. All values are updated in real time.

## Enhanced availability through Fault Diagnostics

- Detailed trip reasons are displayed on the web page
- TMD can connect to the unit over the internet (with the customers permission) to diagnose and support any fault in more detail
- All power supplies are field replaceable items that slot in from the rear panel – new ones can be fitted in a matter of minutes
- The amplifier will log operational hours and any tripped states with a date stamp throughout its life. This greatly aids diagnostics, for instance, TMD can assess (when allowed) whether a TWT is near end of life and arrange a replacement TWT so the amplifier is available when you need it.



Example: Integrated Web Sever Page

## Available Options

Option	Part Number Addition
5" LCD Screen	S
Rear RF Output	R
Rear RF Input	RI
RF Inhibit BNC	IN
IEEE GPIB / RS-232 / RS-422 / RS-485 / Serial USB *	GP / R2 / R4 / R5 / US
Ethernet Web Interface Fiber-Optic **	FO
Rack Slides (100% extension)	RS
3-Phase 208 V <sub>LL</sub>	3P
Extended Pulse Width ***	PTCM2304 model
Reflected Power Monitoring Port	RP
Harmonic Filter	HF
Adjustable Gain	AG
Foldback (Graceful Degradation)	FB
External Accessories ****	E

\*The serial interfaces are available as well, if requested.

\*\*The unit comes with a RJ45 Ethernet port as standard or alternative optional Fibre Optic.

\*\*\* Up to 100us on selected models only

\*\*\* Only available on certain models

\*\*\*\*The External Accessories can include Harmonic Filters or RF Adapters, which need to be requested and specified in the Configuration Summary

For Example: PTCM2000-S-IN-RP has a screen, RF inhibit and reflected Power Monitoring Port