

CPI Electron Device Business - Traveling Wave Tube Transmitter (TWTA) & Switched Mode Power Supply (SMPS)

The PTM7721 switched-mode power supply is designed to operate in conjunction with the Thales TH4021 dual depressed collector traveling wave tube (TWT).

Designated PTX7722, the resulting traveling wave tube amplifier (TWTA) delivers 4 kW peak RF output power at a 10% average duty cycle and up to 15% in burst mode.

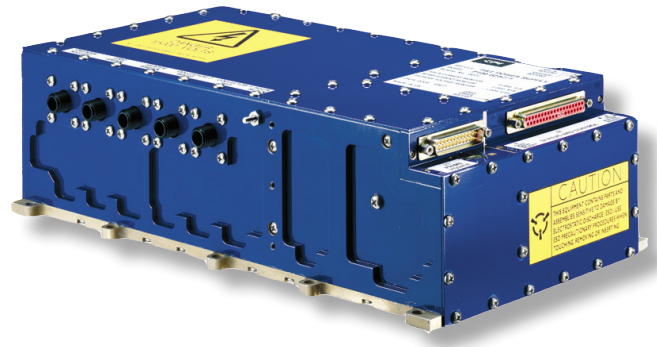
Excellent high voltage stability ensures very low phase noise characteristics.

The PTM7721 allows for full adjustment of all TWT operating parameters. The grid and cathode potentials can be adjusted using controls at ground potential - an important safety & maintenance feature.

The unit's control interface enables remote operation and status monitoring, providing multiple diagnostic outputs for built-in test (BIT) purposes.

The PTM7721 is fully qualified for operation in most military environments.

To learn more about CPI EDB's transmitter capabilities, contact CPI EDB at ElectronDevices@cpi-edb.com or call +44 (0)20 8573 5555



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FEATURES:

- Heater voltage: 6.0 V to 6.6 V
- Cathode voltage: -10.5 kV to -12.5 kV
- Pulse repetition frequency: 150 kHz max
- Duty cycle: 10.0 % average
- Typical weight: 29.8 lbs (13.5 kgs) max
- Pulse width: 0.2 ns min to 150 μ s max
- Peak body: 300 mA max

BENEFITS:

- High-voltage capability
- Compact & lightweight
- Excellent thermal management
- Wide temperature range

APPLICATIONS:

- Radar systems

Outputs to TWT

Typical operating characteristics when used with the Thales TH4021 4 kW, 10%, X-band TWT.

Heater voltage	6.0 to 6.6 V
Heater current	2.5 A (3.5 A max)
Cathode voltage ^{Notes 1&2}	-10.5 to -12.5 kV (11.5 kV typ)
Collector 1 voltage	75% of cathode voltage
Collector 2 voltage	45% of cathode voltage
Peak cathode current	2.20 A max (1.55 A typ)
Peak body (helix) (current)	300 mA max
Duty cycle	10.0% average, 15% burst ^{Note 3}
Grid bias voltage ^{Note 1}	-350 V
Grid drive voltage ^{Note 1}	200 to 350 V (nameplate value)
Grid current	30 mA max
Pulse width	0.2 to 150 μ s
Pulse repetition frequency	150 kHz max
Delay from leading edge of grid window pulse to full RF out	250 ns max
Delay from trailing edge of grid window pulse to full RF cutoff	150 ns max
Maximum spurious FM measured in a 100 Hz bandwidth	-100 dBc/100 Hz

Prime Power Requirement

Prime power	3 phase, 4 wire 115 V line -neutral 400 Hz (alternatives to special order)
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Power consumption	2000 VA maximum (when driving typical TWT load)
Power factor	0.9 min
Efficiency	85% typ

Connectors

Primary power input connector	25 way D-Type ^{Note 4}
Control and monitoring connector	37 way D-Type
High voltage connector type	AMP LGH1-I or equiv
Grid window input pulse:	
Input level to hold TWT on	+3.5 V to +15 V into 100 Ω <0.8 V into 100 Ω
Input to hold TWT off	Minimum 200 ns
Pulse width:	Maximum 150 μ s

Notes:

- 1 Different values are available to special order to suit other TWT's
- 2 Adjustment range -10 kV to -13 kV
- 3 Consult CPI TMD for burst mode ratings
- 4 D38999/20WE08PN when supplied with optional EMC filter; see EVS6408 for further details.

Control and Monitoring

Control inputs (<0.8 V low, +2.4 to +5 V high)	
Standby (Low) /Operate (high) command	
battle override	
Status output (open collector)	Warm up
	Standby
	Operate
	Fault
Cathode voltage monitor	-1 V per kV nominal
Peak cathode current monitor	
	1 V per A nominal
Peak body (helix) current monitor	
	1 V per A nominal
Elapsed time indicator	
	(monitoring heater hours)
	0000 - 9999 hours

Fault Protection

Fault protection outputs (open collector)	
	Excess peak helix current
	Excess mean helix current
	Excess peak beam current
	Excess mean beam current
	Excess duty cycle
	Low/High line voltage
	High cathode voltage
<i>Grid drive is inhibited for low cathode voltage</i>	
	High inverter current
	Low logic voltage
	PSU overtemperature
	TWT overtemperature

Automatic restart	Auto-reset after fault nominally
	8 seconds re-cycle time

Mechanical

Mechanical outline	
Overall dimensions 440 x 187 x 120 mm	
(See attached drawing for details)	
Weight	Power supply alone 29.8 lbs
	(13.5) kgs max
Orientation	Any
Finish	Blue painted/alochrom 1200
Markings/Labels	Type number
	Model number
	Serial number
	Connector indent
	Adjustment indent
	Hazard warning
Cooling	Conduction via baseplate see below

Environmental

Ambient temperature (operating)	
-40 °C to +71 °C	
PSU heatsink temperature	
71 °C maximum (operating)	
Baseplate temperature (PSU)	
85 °C maximum (operating)	
Altitude (operating)	0 - 70,000 ft
Vibration (operating -3 axes)	5 g, 5 -2000 Hz
Shock (3 axes)	20 g , 11 ms half sine
Humidity (non condensing)	95%
Storage temperature	-54 °C to +85 °C
