



**Advanced Test Equipment Corp.**

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**SPECIFICATION FOR A 3.5 kW PULSED  
TRAVELLING WAVE TUBE AMPLIFIER**

**MODEL PTC6382**

**12.4 - 18.0 GHz**

**EVS6454 issue 3 dated 4 July 2006**

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## Document Record

### Source Document

TMD specifications

### Applicable Documents

None

### Amendment Record

#### Issue 2 - Change Note 2592

Page Amendment

- 2, 5 max operating duty reduced from 8% to 6%
- 5 max pulse width reduced to 20  $\mu$ s , and 50  $\mu$ s optional
- 5 max PRF reduced to 20kHz, and 100kHz optional
- 5 typical propagation delay reduced from 250 to 200ns
- 5 max prime power reduced from 2.8kVA to 2.5kVA

#### Issue 3 - Change Note 2728

Lower operating frequency increased from 12.0 to 12.4 GHz

RF output power increased from 3kW min to 3.5kW min

Typical harmonic reduced from -10dBc to -20dBc

Prime power consumption reduced

This specification describes a Travelling Wave Tube based High Power RF Amplifier model PTC6382. The amplifier has been designed to operate in the pulse mode with duty cycles up to 6%. Features include digital front panel, forward power monitoring, reverse power protection, Power Factor Correction, 220 to 240 VAC single phase operation or 100 to 120V AC three phase operation without any adjustment. The amplifier has IEEE 488 remote control and monitoring. Cooling is by forced air with internal fan. The amplifier can be fitted with additional options.

Front Panel Indicators

Standby	:	On when TWT has finished warming up 3 minutes after application of prime power.
Operate	:	On when unit switched to Operate
Elapsed Time	:	Mechanical indicators for Heater and High Voltage hours
LCD Display	:	Displays unit status and configuration

Front Panel Controls

Line On	:	Applies power to fan and PSU
Operate	:	Applies TWT high voltage and enables RF output
Standby	:	Returns unit to standby mode
Menu Controls	:	Up, Down, Enter, Back

Remote Operation

Information Command	Status
Information Replies	Filament Time Delay Standby Operate  Tripped, the cause being one of the following:- Unit Hot High Reflected Power Helix Over-current Cathode Over-current Helix Arc Over Duty Line Volts Low Logic Volts Interlock Error Watchdog Activated
State Changing Commands	Remote Local Operate Standby / Reset

## Electrical Interface Specification

### Connector 1

Connector Function : Mains input Power  
Type : MS3102-20-4P  
Single phase socket wiring : Pin A-phase, B-neutral, C-not connected, D-earth  
Three phase socket wiring : Pin A-phase 1, B-phase 2, C-phase 3, D-earth  
Location : Rear Panel

### Connector 2

Connector Function : Pulse Modulator Input  
Type : BNC Jack 50Ω  
Location : Front Panel  
Signal Type : 5V TTL, active high

### Connector 3

Connector Function : RF Input  
Type : N female 50Ω  
Location : Front Panel

### Connector 4

Connector Function : Amplifier RF Output  
Type : WR62 waveguide flange  
Location : Front Panel

### Connector 5

Connector Function : Forward Power Monitoring  
Type : N female 50Ω  
Location : Front Panel

### Connector 6

Connector Function : Chassis Earth  
Type : M6 x 20 stud  
Location : Rear Panel

### Connector 7

Connector Function : IEEE 488 Control and Monitoring  
Type : Centronics style  
Location : Rear Panel

**Electrical Specification**

Parameter	Min	Typ	Max	Unit
<u>RF Input</u>				
Frequency	12.4		18.0	GHz
Amplitude		-5	0	dBm CW
<u>Pulse Modulator Input</u>				
Inhibit	0		0.7	V (into 50Ω)
Transmit	2.0		5.0	V (into 50Ω)
Pulse Width	0.2		20	μs, <i>Note 1</i>
Pulse Repetition Freq.	0		20	kHz, <i>Note 2</i>
<u>RF Output</u>				
Forward Peak Power	3.5	4		kW Pulse
Peak Reflected Power			750	W Peak, trip level setting
Duty Cycle	0		6	%
Forward Power Monitor		-50		dB
Max Load VSWR			3:1	ratio, <i>Note 3</i>
Spurious		-50	-40	dBc
Harmonic		-20		dBc, <i>Note 4</i>
Pulse Rise/Fall Time		20	100	ns
Beam on Noise Power Density		2		dBm/MHz
Beam off Noise Power Density		-100		dBm/MHz
Pulse propagation delay		200	300	ns
<u>Prime Power</u>				
Voltage	220		240	VAC phase-neutral
Alternative Prime Power Input	170		210	VAC phase-phase (3 phase)
Frequency	47		440	Hz
Start-up Current			10	A
Power Consumption		1.6	2.3	kVA

*Note 1:* The maximum pulse width can be optionally increased to 50μs.

*Note 2:* The maximum PRF can be optionally increased to 100kHz.

*Note 3:* Full band VSWR. Maximum load VSWR is specified for no damage.

*Note 4:* Harmonics can be reduced with optional harmonic filtering available.

### **Mechanical Specification**

Width	:	19" (483mm) front panel width
Height	:	4U (178mm) front panel height
Depth	:	780mm maximum from rear face of front panel, including handles.
Weight	:	35 kg typical
Cooling	:	Forced air cooling using internal fan. Air enters through the side and rear panel and exhausts through the rear panel of the amplifier which must not be obstructed

### **Environmental Specification**

Environment	:	Fixed, indoor installation
Storage Temperature	:	-20 to +70 °C
Ambient Operating Temp.	:	0 to +50 °C
Operating Humidity	:	5% to 95 % RH, non-condensing
Operating Altitude	:	3,000 ft max, 10,000ft is optional
Non Operating Altitude	:	50,000 ft max
Shocks and Vibration	:	Commercial
Acoustic Noise	:	70dBa typically
Operating Position	:	Any