



**Model 4000TP4G8,  
M1 through M23  
4000 Watt Pulse Amplifier  
4-8 GHz**

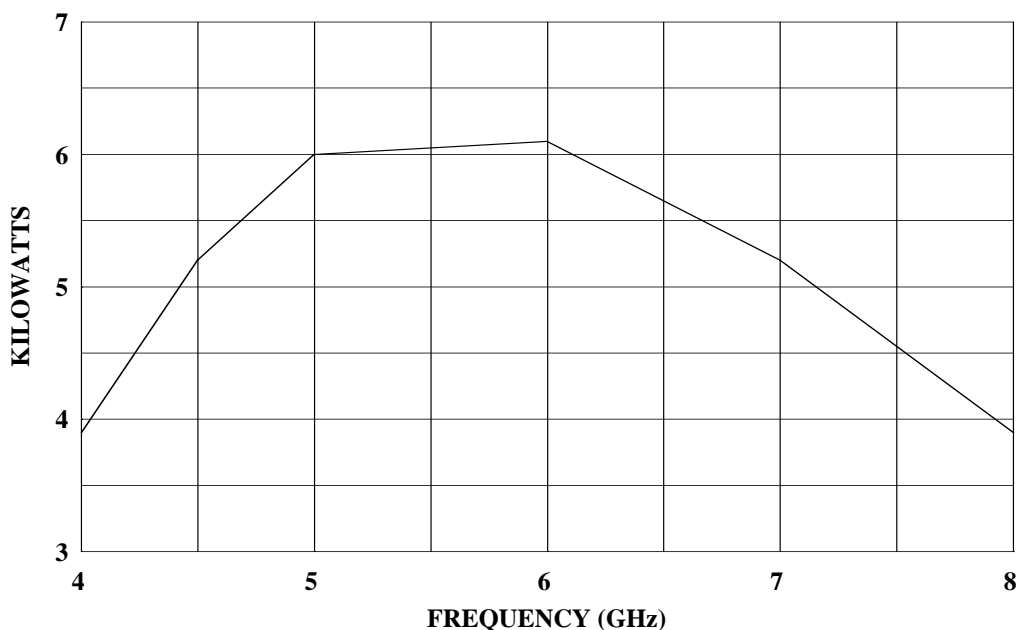
The Model 4000TP4G8 is a self contained, forced air cooled, broadband traveling wave tube (TWT) microwave amplifier designed for pulse applications at low to moderate duty factors where instantaneous bandwidth and high gain are required. A reliable TWT provides a conservative 3800 watts minimum peak RF pulse power at the amplifier output connector. Stated power specifications are at the fundamental frequency.

The amplifier's front panel digital display shows forward and reflected average power output or forward and reflected peak power, plus extensive system status information accessed through a series of menus via soft keys. Status indicators include power on, warm-up, standby, operate, faults, excess average or peak reflected power warning and remote. Standard features include a built-in IEEE-488 (GPIB) interface, 0dBm input, TTL Gating, VSWR protection, gain control, RF output sample port, auto sleep, plus monitoring of TWT helix current, cathode voltage, collector voltage, heater current, heater voltage, baseplate temperature and cabinet temperature. Modular design of the power supply and RF components allow for easy access and repair. Use of switching mode power supplies results in significant weight reduction.

Housed in a stylish contemporary cabinet, the amplifier provides readily available pulsed RF power for a variety of applications in Test and Measurement, (including EMC RF pulse susceptibility testing), Industrial and University Research and Development, and Service applications. AR also offers a broad range of amplifiers for CW (Continuous Wave) applications.

See Model Configurations for alternative prime power, packaging, and special features.

**4000TP4G8 Typical Peak Pulse Power Output**



## SPECIFICATIONS, MODEL 400TP4G8

### POWER (Fundamental), Peak Pulse, @ Output

Nominal .....	5000 watts
Minimum .....	3.8 kW from 4–4.5 GHz
	4.0 kW from 4.5–7.5 GHz
	3.8 kW from 7.5–8.0 GHz

FLATNESS..... ±10 dB maximum

FREQUENCY RESPONSE..... 4-8 GHz

INPUT FOR RATED OUTPUT..... 1.0 milliwatt maximum

GAIN (at maximum setting)..... 66 dB minimum

GAIN ADJUSTMENT (continuous range)..... 35 dB minimum

INPUT IMPEDANCE..... 50 ohms, VSWR 2.5:1 maximum

OUTPUT IMPEDANCE..... 50 ohms, VSWR 2.5:1 typical

MISMATCH TOLERANCE..... Output pulse width foldback protection at peak reflected power exceeding 2000 watts. Will operate without damage or oscillation with any magnitude and phase of source and load impedance. May oscillate with unshielded open due to coupling to input. Should not be tested with connector off.

### PULSE CAPABILITY

Pulse Width..... 0.07 – 100 microseconds.

Pulse Rate (PRF)..... 100 kHz maximum

Duty Cycle..... 4% maximum.

RF Rise and Fall..... 30 ns max (10% to 90%).

Delay..... 300 ns maximum from pulse input to RF 90%

Pulse Width Distortion..... ±30 ns maximum (50% points of output pulse width compared to 50% points of input pulse width)

Pulse Off Isolation..... 80 dB minimum, 90 dB typical

Pulse Input..... TTL level, 50 ohm nominal termination

### NOISE POWER DENSITY

(pulse on)..... Minus 65 dBm/Hz (maximum); Minus 75 dBm/Hz (typical)

(pulse off)..... Minus 140 dBm/Hz (typical)

HARMONIC DISTORTION..... Minus 0 dBc maximum

PRIMARY POWER..... See Model Configurations

### CONNECTORS

RF input..... Type N female on rear panel

RF output..... Type WRD350 waveguide flange on rear panel

RF output forward sample port..... Type N female on rear panel

Pulse input..... Type BNC female on rear panel

GPIB..... IEEE-488 female on rear panel

Interlock..... DB-15 female on rear panel

COOLING..... Forced air (self contained fans), air entry and exit in rear.

SIZE AND WEIGHT..... See Model Configurations

**MODEL CONFIGURATIONS AND FEATURES - MODEL 4000TP4G8**

- E** Must select one enclosure type from the following [E1 or E2 or E2S]:
- E1 with removable outer enclosure, size 19.8 x 17.5 x 33 in., 51 x 44.5 x 84 cm, weight 155 lbs, 71 kg.
- E2 without outer enclosure, for rack mounting, size 19 x 10.5 x 31 in, 48.3 x 27 x 79cm. weight of E1 less 30 lbs, 14 kg.
- E2S without outer enclosure, for rack mounting with slides and front pull handles installed, size 19 x 10.5 x 31 in, 48.3 x 27 x 79cm. , weight of E2 plus 5 lbs, 2kg.
- P** Must select one primary power from the following [P1 or P2]
- P1 208 VAC ± 10% three phase 50/60 Hz 2.5 KVA maximum
- P2 190-260 VAC single phase 50/60 Hz 2.5 KVA maximum
- S** May select a special feature (extra cost) from the following [S1R and/or S2K]:
- S1R Reflected power sample port, type N female connector on rear panel. Forward and reflected sample port calibration data supplied on disk in Excel format at 51 points, evenly spaced over specified frequency response.
- S2K Supplied with one TF type externally mountable harmonic filter and a switch kit that allows user to select an appropriate filter band, high (which bypasses filter) or low (which applies filter), via this TWTA. Insertion loss when used with filters is maximum 1.5 dB. Minimum harmonic separation is minus 20 dBc with switch kit applied. See **TF Type Filter Specifications** table below. Amplifier dimensions and weight do not include kits and filter. Add 35 lbs, 16 kg.

Model	Features			
	4000TP4G8	E	P	S
4000TP4G8	E1	P1	-	
M1	E2	P1	-	
M2	E2S	P1	-	
M3	E1	P2	-	
M4	E2	P2	-	
M5	E2S	P2	-	
M6	E1	P1	S1R	
M7	E2	P1	S1R	
M8	E2S	P1	S1R	
M9	E1	P2	S1R	
M10	E2	P2	S1R	
M11	E2S	P2	S1R	
M12	E1	P1	S2K	
M13	E2	P1	S2K	
M14	E2S	P1	S2K	
M15	E1	P2	S2K	
M16	E2	P2	S2K	
M17	E2S	P2	S2K	
M18	E1	P1	S1R & S2K	
M19	E2	P1	S1R & S2K	
M20	E2S	P1	S1R & S2K	
M21	E1	P2	S1R & S2K	
M22	E2	P2	S1R & S2K	
M23	E2S	P2	S1R & S2K	

**S2K – TF TYPE FILTER SPECIFICATIONS**

Microwave Filter Model	For Use with AR TWTA Model	Pass Band (GHz)	Insertion Loss (dB max)	Reject Band (GHz)	Rejection (dB min)	Power (fundamental & harmonic, watts, max)	Input Connector	Output connector	Size L x W x D (cm, in max)	Weight (kg, lbs typical)	Input VSWR in Pass band (typical)	Input VSWR in Reject band (typical)
TF type filter 1	4000TP4G8 with WRD350 waveguide	4.0-6.4	0.5	8.0 – 15	25	300 & 300 average 7000 & 6000 peak	WRD350 waveguide	WRD350 waveguide	76 x 10 x 31 30 x 4 x 12	11, 25	1.3:1	2.5:1