

# *Our Products Have Always Outlasted And Outperformed The Competition. Now We're Giving Them Another Problem.*



**We've shrunk our "S" amplifiers to give you more power with an even greater price/performance ratio.**

Our new 1 to 4.2 GHz "S" Series solid-state amplifiers are typical of how AR is giving our customers more for their money... and that's giving our competition some big problems.

These innovative amps are lighter, more portable, and up to 50% smaller. Yet they deliver up to 800 watts of power. They also use less energy, thanks to a more efficient design.

The "S" amplifiers are designed so that when you need more power, you can add additional amplifiers, instead of tossing out your amp and starting all over. When you add amplifiers, you can use them together or independently. This unique, flexible, money-saving feature is called "Subampability."

AR innovations like this are making our microwave amplifiers very popular with customers. Our competition, however, is not so pleased.

# Microwave Amplifiers

## 0.8 to 4.2 GHz

### Microwave Amplifiers "S" Series: Value, Quality & Powerful Innovations "S" Series – Solid State. 0.8 to 18 GHz, – 1 to 800 watts.

Our "S" Series amplifiers are Mismatch Tolerant providing 100% of rated power without foldback. These amplifiers will operate without damage or oscillation with any magnitude and phase of source and load impedance. See Application Note #27A for more information on mismatch tolerance.

All our "S" Series Microwave Amplifiers have modulation capability that will faithfully reproduce AM, FM or Pulse Modulation appearing on the input signal. The AM peak envelope power is limited to specified power.

**Subampability™**: (*sub-amp-ability*). *noun*:  
The ability to use an amplifier individually, or as a building block, upon which power can be added incrementally.

#### Add Power To Existing Amps.

Many amplifiers within our "S" Series are designed so that the power can be expanded with a relatively simple upgrade. Of course, the amplifiers can still be used individually when needed.

#### Standard Remote Interfaces (where applicable)

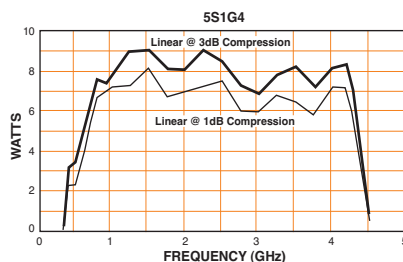
IEEE-488	24 pin female
RS-232	9 pin Subminiature D Female
RS-232 (fiber optic)	Type ST
USB 2.0	Type B
Ethernet	RJ-45

#### 5S1G4 Solid State Amplifier



#### 5 watts. 0.8-4.2 GHz CW

Rated Power Output	6.5 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	
Nominal 8 watts / min. 6.5 watts	
Power Output @ 1dB compression	
Nominal 7 watts / min. 5 watts	
Flatness	±1.5dB typ. / ±2dB max.
Frequency Response	0.8 -4.2 GHz instantaneously
Gain (at max. setting)	37dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Harmonic Distortion	Minus 20dBc max. at 5 watts
Third Order Intercept Point	49dBm typ.
Primary Power (selected automatically)	
90 - 132, 180 - 264 VAC	
50/60 Hz, single phase	
150 watts max.	
Connectors	
RF input	Type N female on front panel
RF output	Type N female on front panel
Cooling	Forced air (self contained fans)
Weight	17.2 kg (38 lb)
Size (WxHxD)	50.3 x 15.5 x 30 cm / 19.8 x 6.1 x 11.8 in.

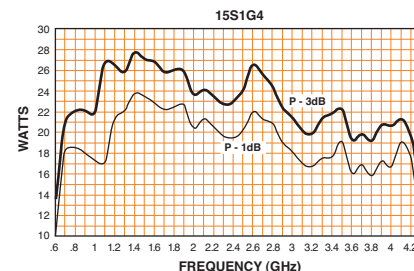


#### 15S1G4 Solid State Amplifier



#### 15 watts. 0.8-4.2 GHz CW

Rated Power Output	15 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	
Nominal 20 watts / min. 16 watts	
Power Output @ 1dB compression	
Nominal 18 watts / min. 14 watts	
Flatness	±1.5dB typ. / ±2dB max.
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	42dB min.
Gain Adjustment (continuous range)	10dB min. (4096 steps remote)
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Harmonic Distortion	Minus 20dBc max. at 15 watts
Spurious	Minus 73dBc typ.
Third Order Intercept Point	52dBm typ.
Noise Figure	10dB typ.
Primary Power (selected automatically)	
90 - 132, 180 - 264 VAC	
50/60 Hz, single phase	
150 watts max.	
Connectors	
RF input	Type N female on front panel
RF output	Type N female on front panel
Standard Remote Interfaces Included	
Cooling	Forced air (self contained fans)
Weight	16.1 kg (35.5 lb)
Size (WxHxD)	50.3 x 15.5 x 37.6 cm / 19.8 x 6.1 x 14.8 in.



### 30S1G4 Solid State Amplifier



#### 30 watts. 0.8-4.2 GHz CW

Rated Power Output	30 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	Nominal 35 watts / min. 30 watts
Power Output @ 1dB compression	Nominal 30 watts / min. 24 watts
Flatness	± 1.5dB typ. / ± 2dB max.
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	45dB min.
Gain Adjustment (continuous range)	10dB min. (4096 steps remote)
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Third Order Intercept	55dBm typ.
Harmonic Distortion	Minus 20dBc max. at 30 watts
Spurious	Minus 73dBc typ.
Noise Figure	10dB typ.
Phase Linearity	± 1 deg/100 MHz, typ.
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC 50/60 Hz, single phase 315 watts max.
Connectors	RF input Type N female on front panel RF output Type N female on front panel Standard Remote Interfaces Included
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	18.2 kg (40 lb)
Size (WxHxD)	50.3 x 15.5 x 37.6 cm / 19.8 x 6.1 x 14.8 in.

### 60S1G4 Solid State Amplifier



#### 60 watts. 0.8-4.2 GHz CW

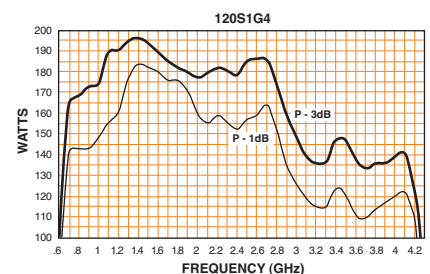
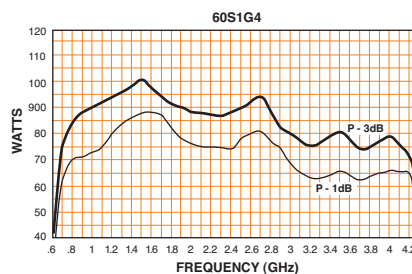
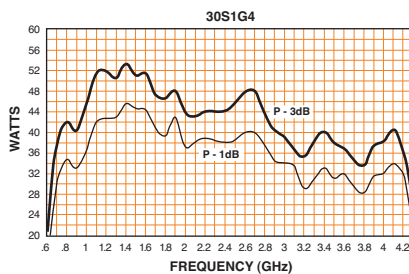
Rated Power Output	60 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	Nominal 70 watts / min. 55 watts
Power Output @ 1dB compression	Nominal 65 watts / min. 50 watts
Flatness	± 1.5dB typ. / ± 2dB max.
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	47.8dB min.
Gain Adjustment (continuous range)	10dB min. (4096 steps remote)
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Third Order Intercept	58dBm typ.
Harmonic Distortion	Minus 20dBc max. at 60 watts
Noise Figure	10dB typ.
Spurious	Minus 73dBc typ.
Phase Linearity	± 1 deg/100 MHz, typ.
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC 50/60 Hz, single phase 450 watts max.
Connectors	RF input Type N female on front panel RF output Type N female on front panel Standard Remote Interfaces Included
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	28.4 kg (62.5 lb)
Size (WxHxD)	50.3 x 20.3 x 54.6 cm / 19.8 x 8 x 21.5 in.

### 120S1G4 Solid State Amplifier



#### 120 watts. 0.8-4.2 GHz CW

Rated Power Output	120 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	Nominal 140 watts / min. 115 watts
Power Output @ 1dB compression	Nominal 120 watts / min. 100 watts
Flatness	± 1.5dB typ. / ± 2dB max. / ± 1dB with Internal Leveling
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	51dB min.
Gain Adjustment (continuous range)	15dB min. (4096 steps remote)
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	0 - 200 Watts
Third Order Intercept	61dBm typ.
Harmonic Distortion	Minus 20dBc max. at 100 watts
Spurious	Minus 73dBc typ.
Phase Linearity	± 1 deg/100 MHz, typ.
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC 50/60 Hz, single phase 900 watts max.
Connectors	RF input Type N female on front panel RF output Type N female on front panel Standard Remote Interfaces Included ALC & Pulse Type BNC on front panel
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	40.3 kg (89 lb)
Size (WxHxD)	50.3 x 30 x 61 cm / 19.8 x 11.8 x 24 in.



# Microwave Amplifiers

## 0.8 to 4.2 GHz

240S1G4 Solid State Amplifier



### 240 watts. 0.8-4.2 GHz CW

Rated Power Output	240 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	
Nominal	250 watts / min. 200 watts
Power Output @ 1dB compression	
Nominal	230 watts / min. 180 watts
Flatness	
±2dB max. / ±1dB with Internal Leveling	
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	54dB min.
Gain Adjustment (continuous range)	
15dB min. (4096 steps remote)	
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward and reflected
Third Order Intercept	65dBm typ.
Harmonic Distortion	Minus 20dBc max. at 200 watts
Spurious	Minus 73dBc typ.
Primary Power	
120 - 240 VAC	
50/60 Hz, single phase	
1800 watts max.	
Connectors	
RF input	Type N female on front panel
RF output	Type N female on front panel
External Leveling and Pulse Modulation Inputs	
Type BNC female on front panel	
Detected RF output	Type BNC female on front panel
Standard Remote Interfaces Included	
Safety Interlock	15 pin female Subminiature D on rear panel
Cooling	Forced air (self contained fans)
Weight	82.2 kg (190 lb)
Size (WxHxD)	
50.3 x 55.9 x 61 cm / 19.8 x 22 x 24 in.	

450S1G4 Solid State Amplifier



### 450 watts. 0.8-4.2 GHz CW

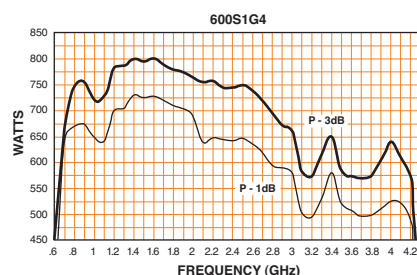
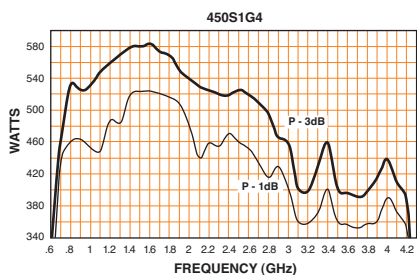
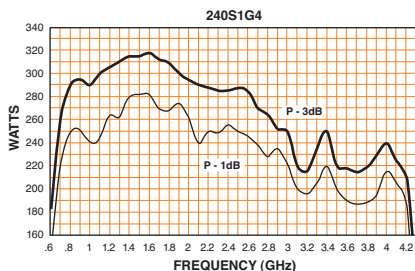
Rated Power Output	450 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	
Nominal	475 watts / min. 375 watts
Power Output @ 1dB compression	
Nominal	440 watts / min. 340 watts
Flatness	±3dB max.
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	56.5dB min.
Gain Adjustment	15dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward and reflected
Third Order Intercept	65dBm typ.
Harmonic Distortion	Minus 20dBc max. at 380 watts
Primary Power	
100 - 240 VAC	
50/60 Hz, single phase	
4050 watts max.	
Connectors	
RF input	Type N female on front panel
RF output	Type 7-16 on rear panel
Standard Remote Interfaces Included	
Safety Interlock	15 pin female Subminiature D on rear panel
Cooling	Forced air (self contained fans)
Weight	218 kg (480 lb)
Size (WxHxD)	
56.3 x 173 x 67.1 cm / 22.1 x 68.0 x 24.4 in.	

600S1G4 Solid State Amplifier



### 600 watts. 0.8-4.2 GHz CW

Rated Power Output	600 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	
Nominal	625 watts / min. 525 watts
Power Output @ 1dB compression	
Nominal	570 watts / min. 470 watts
Flatness	±3dB max.
Frequency Response	0.8 - 4.2 GHz instantaneously
Gain (at max. setting)	57.8dB min.
Gain Adjustment	15dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward and reflected
Third Order Intercept	67dBm typ.
Harmonic Distortion	Minus 20dBc max. at 500 watts
Primary Power	
100 - 240 VAC	
50/60 Hz, single phase	
5900 watts max.	
Connectors	
RF input	Type N female on front panel
RF output	Type 7-8 EIA on rear panel
Standard Remote Interfaces Included	
Safety Interlock	15 pin female Subminiature D on rear panel
Cooling	Forced air (self contained fans) enters front and bottom
Weight	340.2 kg (750 lb)
Size (WxHxD)	
56.1 x 152.4 x 67.1 cm / 22.1 x 60.0 x 26.4 in.	



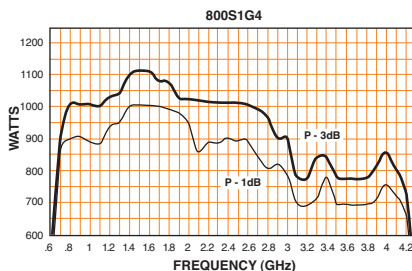
# 4 to 8 GHz

## 800S1G4 Solid State Amplifier



### 800 watts. 0.8-4.2 GHz CW

<b>Rated Power Output</b>	800 watts min.
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Power Output @ 3dB compression</b>	
Nominal 800 watts / min. 700 watts	
<b>Power Output @ 1dB compression</b>	
Nominal 725 watts / min. 625 watts	
<b>Flatness</b>	±3dB max.
<b>Frequency Response</b>	0.8 - 4.2 GHz instantaneously
<b>Gain (at max. setting)</b>	59dB min.
<b>Gain Adjustment</b>	15dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, nominal
<b>RF Power Display</b>	Digital, forward and reflected
<b>Third Order Intercept</b>	68dBm typ.
<b>Harmonic Distortion</b>	Minus 20dBc max. at 675 watts
<b>Primary Power</b>	
100 - 240 VAC	
50/60 Hz, single phase	
7200 watts max.	
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type 7-8 EIA on rear panel
Standard Remote Interfaces Included	
<b>Safety Interlock</b>	15 pin female Subminiature D on rear panel
<b>Cooling</b>	Forced air (self contained fans) enters front and bottom
<b>Weight</b>	400 kg (880 lb)
<b>Size (WxHxD)</b>	56.1 x 152.4 x 67.1 cm / 22.1 x 60.0 x 26.4 in.

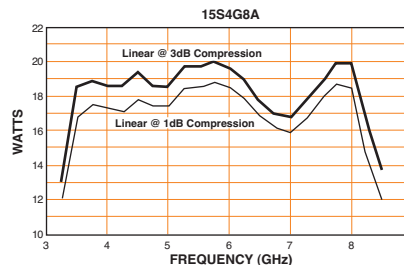


## 15S4G8A Solid State Amplifier



### 15 watts. 4.0-8.0 GHz CW

<b>Rated Power Output</b>	15 watts min.
<b>Input For Rated Output</b>	1 milliwatt max., 0dBm
<b>Power Output @ 3dB compression</b>	
Nominal 19 watts / min. 16 watts	
<b>Power Output @ 1dB compression</b>	
Nominal 16 watts / min. 14 watts	
<b>Flatness</b>	±1dB typ. / ±2dB max.
<b>Frequency Response</b>	4.0 - 8.0 GHz instantaneously
<b>Gain (at max. setting)</b>	42dB min.
<b>Gain Adjustment (continuous range)</b>	10dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.5:1 max.
<b>Output Impedance</b>	50 ohms, nominal
<b>Third Order Intercept Point</b>	51dBm typ.
<b>Harmonic Distortion</b>	Minus 20dBc max. at 15 watts
<b>Primary Power (selected automatically)</b>	
90 - 132, 180 - 264 VAC	
50/60 Hz, single phase	
<300 watts max.	
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on front panel
Standard Remote Interfaces Included	
<b>Safety Interlock</b>	15 Pin Subminiature D
<b>Cooling</b>	Forced air (self contained fans)
<b>Weight</b>	31.3 kg (69 lb)
<b>Size (WxHxD)</b>	50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in

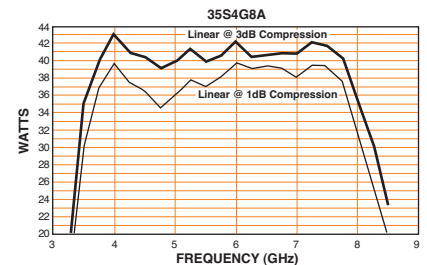


## 35S4G8A Solid State Amplifier



### 35 watts. 4.0-8.0 GHz CW

<b>Rated Power Output</b>	35 watts min.
<b>Input For Rated Output</b>	1 milliwatt max., 0dBm
<b>Power Output @ 3dB compression</b>	
Nominal 38 watts / min. 32 watts	
<b>Power Output @ 1dB compression</b>	
Nominal 32 watts / min. 28 watts	
<b>Flatness</b>	±1 dB typ. / ±2dB max.
<b>Frequency Response</b>	4.0 - 8.0 GHz instantaneously
<b>Gain (at max. setting)</b>	45.5dB min.
<b>Gain Adjustment (continuous range)</b>	10dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.5:1 max.
<b>Output Impedance</b>	50 ohms, nominal
<b>Third Order Intercept</b>	54dBm typ.
<b>Harmonic Distortion</b>	Minus 20dBc max. at 35 watts
<b>Primary Power (selected automatically)</b>	
90 - 132, 180 - 264 VAC	
50/60 Hz, single phase	
<550 watts max.	
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on front panel
Standard Remote Interfaces Included	
Sub-Amplifier Interface	RJ-45
<b>Safety Interlock</b>	15 pin Subminiature D
<b>Cooling</b>	Forced air (self contained fans)
<b>Weight</b>	42.6 kg (94 lb)
<b>Size (WxHxD)</b>	50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in.



# 4 to 8 GHz

## 60S4G8 Solid State Amplifier



### 60 watts. 4.0-8.0 GHz CW

Rated Power Output	60 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 70 watts / min. 60 watts
Power Output @ 1dB compression	Nominal 60 watts / min. 55 watts
Flatness	±1.5dB typ. / ±2dB max.
Frequency Response	4.0 - 8.0 GHz instantaneously
Gain (at max. setting)	47.8dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward, and reflected
Third Order Intercept Point	56dBm typ.
Harmonic Distortion	Minus 20dBc max. at 60 watts
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC
	50/60 Hz, single phase
	<1300 watts max.
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on rear panel
External Leveling Inputs	Type BNC female on front panel
Pulse Modulation Input	Type BNC female on front panel
Detected RF Output	Type BNC female on front panel
Standard Remote Interfaces Included	
<b>Safety Interlock</b>	15 pin Subminiature D
<b>Cooling</b>	Forced air (self contained fans)
<b>Weight</b>	113.4 kg (250 lb)
<b>Size (WxHxD)</b>	56.1 x 90.2 x 67.1 cm / 22.1 x 35.5 x 26.4 in.

## 90S4G8 Solid State Amplifier



### 90 watts. 4.0-8.0 GHz CW

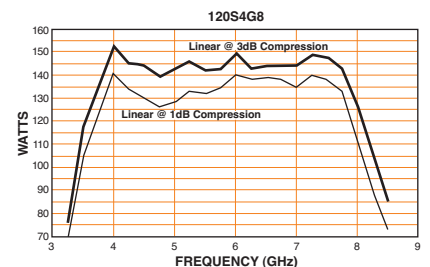
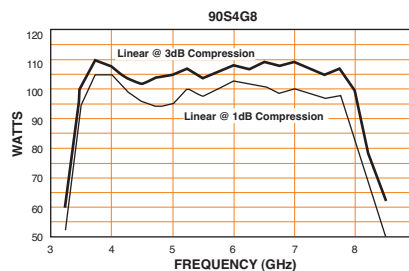
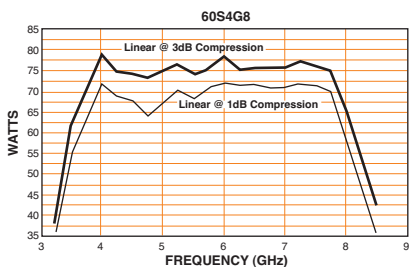
Rated Power Output	90 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 100 watts / min. 90 watts
Power Output @ 1dB compression	Nominal 90 watts / min. 75 watts
Flatness	±1.5dB typ. / ±2.5dB max.
Frequency Response	4.0 - 8.0 GHz instantaneously
Gain (at max. setting)	49.6dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward, and reflected
Third Order Intercept Point	57dBm typ.
Harmonic Distortion	Minus 20dBc max. at 90 watts
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC
	50/60 Hz, single phase
	<1800 watts max.
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on rear panel
External Leveling Inputs	Type BNC female on front panel
Pulse Modulation Input	Type BNC female on front panel
Detected RF Output	Type BNC female on front panel
Standard Remote Interfaces Included	
<b>Safety Interlock</b>	15 pin Subminiature D
<b>Cooling</b>	Forced air (self contained fans)
<b>Weight</b>	148 kg (325 lb)
<b>Size (WxHxD)</b>	56.1 x 152.4 x 67 cm / 22.1 x 60.0 x 26.4 in.

## 120S4G8 Solid State Amplifier



### 120 watts. 4.0-8.0 GHz CW

Rated Power Output	120 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 135 watts / min. 120 watts
Power Output @ 1dB compression	Nominal 120 watts / min. 100 watts
Flatness	±1.5dB typ. / ±2.5dB max.
Frequency Response	4.0 - 8.0 GHz instantaneously
Gain (at max. setting)	50.8dB min.
Gain Adjustment (continuous range)	15dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward, and reflected
Third Order Intercept Point	58dBm typ.
Harmonic Distortion	Minus 20dBc max. at 120 watts
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC
	50/60 Hz, single phase
	<2200 watts max.
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on rear panel
External Leveling Inputs	Type BNC female on front panel
Pulse Modulation Input	Type BNC female on front panel
Detected RF Output	Type BNC female on front panel
Standard Remote Interfaces Included	
<b>Safety Interlock</b>	15 pin Subminiature D
<b>Cooling</b>	Forced air (self contained fans)
<b>Weight</b>	172.4 kg (380 lb)
<b>Size (WxHxD)</b>	56.1 x 152.4 x 67.1 cm / 22.1 x 60 x 26.4 in.



# 4 to 10.6 GHz

## 225S4G8A Solid State Amplifier



### 225 watts. 4.0-8.0 GHz CW

Rated Power Output	225 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 225 watts / min. 200 watts
Power Output @ 1dB compression	Nominal 215 watts / min. 180 watts
Flatness	±1.5dB typ. / ±2.5dB max.
Frequency Response	4.0 - 8.0 GHz instantaneously
Gain (at max. setting)	53.6dB min.
Gain Adjustment (continuous range)	15dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward, and reflected
Third Order Intercept Point	62dBm typ.
Harmonic Distortion	Minus 20dBc max. at 225 watts
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC
	50/60 Hz, single phase
	<4500 watts max.
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on rear panel
External Leveling Inputs	Type BNC female on front panel
Pulse Modulation Input	Type BNC female on front panel
Detected RF Output	Type BNC female on front panel
Standard Remote Interfaces Included	
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	227 kg (500 lb)
Size (WxHxD)	68.8 x 106.7 x 97.5 cm / 27.1 x 42 x 38.4 in.

## 5S4G11 Solid State Amplifier



### 5 watts. 4.0-10.6 GHz CW

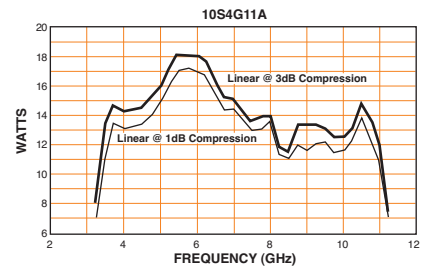
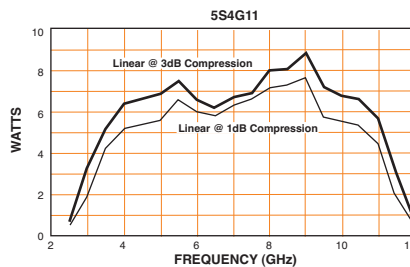
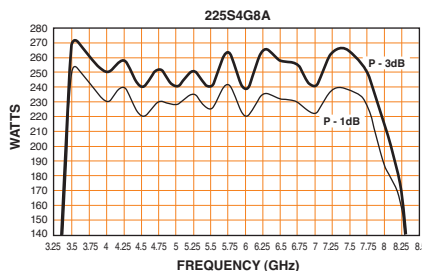
Rated Power Output	5 watt min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	Nominal 7 watts / min. 5.5 watt
Power Output @ 1dB compression	Nominal 6 watt / min. 4.5 watts
Flatness	±2dB typ. / ±3dB max.
Frequency Response	4.0 - 10.6 GHz instantaneously
Gain (at max. setting)	37dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
Harmonic Distortion	Minus 20dBc max. at 5 watts
Third Order Intercept Point	47dBm typ.
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC
	50/60 Hz, single phase
	175 watts max.
<b>Connectors</b>	
RF input	Type N female on front panel
RF output	Type N female on front panel
Cooling	Forced air (self contained fans)
Weight	20.5 kg (45 lb)
Size (WxHxD)	50.3 x 15.5 x 37.6 cm / 19.8 x 6.1 x 14.8 in.

## 10S4G11A Solid State Amplifier



### 10 Watts. 4.0-10.6 GHz CW

Rated Power Output	10 watts min.
Input For Rated Output	1 milliwatt max.
Power Output @ 3dB compression	Nominal 13 watts / min. 10 watts
Power Output @ 1dB compression	Nominal 11 watts / min. 9 watts
Flatness	±2dB typ. / ±3dB max.
Frequency Response	4.0 - 10.6 GHz instantaneously
Gain (at max. setting)	40dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
Harmonic Distortion	Minus 20dBc max. at 10 watts
Third Order Intercept Point	50dBm typ.
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC
	50/60 Hz, single phase
	<3000 watts max.
<b>Connectors</b>	
RF input	Type N female on rear panel
RF output	Type N female on rear panel
Standard Remote Interfaces Included	
Safety Interlock	15 Pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	31.3 kg (69 lb)
Size (WxHxD)	50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in



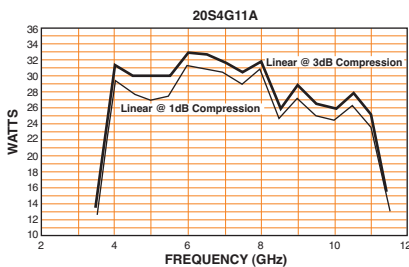
# Microwave Amplifiers 4 to 10.6 GHz

## 20S4G11A Solid State Amplifier



### 20 watts. 4.0-10.6 GHz CW

Rated Power Output	20 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 25 watts / min. 20 watts
Power Output @ 1dB compression	Nominal 22 watts / min. 18 watts
Flatness	±2dB typ. / ±3dB max.
Frequency Response	4.0 - 10.6 GHz instantaneously
Gain (at max. setting)	43dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
Third Order Intercept Point	52dBm typ.
Harmonic Distortion	Minus 20dBc max. at 20 watts
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC 50/60 Hz, single phase <550 watts max.
Connectors	RF input Type N female on front panel RF output Type N female on front panel Standard Remote Interfaces Included
Safety Interlock	15 Pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	42.6 kg (94 lb)
Size (WxHxD)	50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in

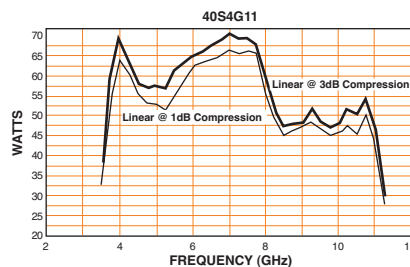


## 40S4G11 Solid State Amplifier



### 40 watts. 4.0-10.6 GHz CW

Rated Power Output	40 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 45 watts / min. 40 watts
Power Output @ 1dB compression	Nominal 40 watts / min. 36 watts
Flatness	±2 dB typ. / ±3dB max.
Frequency Response	4.0 - 10.6 GHz instantaneously
Gain (at max. setting)	46dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
Third Order Intercept	52dBm typ.
Harmonic Distortion	Minus 20dBc max. at 40 watts
RF Power Display	Digital, forward, and reflected
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC 50/60 Hz, single phase <1300 watts max.
Connectors	RF input Type N female on front panel RF output Type N female on rear panel External Leveling Inputs Type BNC female on front panel Pulse Modulation Input Type BNC female on front panel Detected RF Output Type BNC female on front panel Standard Remote Interfaces Included
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	113.4 kg (250 lb)
Size (WxHxD)	56.1 x 90.2 x 67.1 cm / 22.1 x 35.5 x 26.4 in.

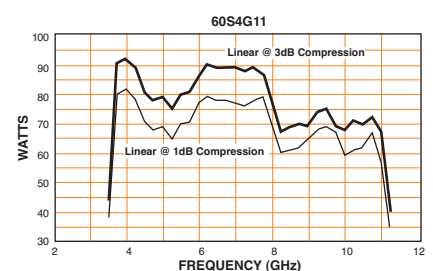


## 60S4G11 Solid State Amplifier

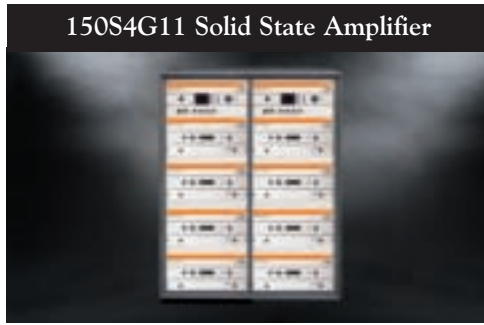


### 60 watts. 4.0-10.6 GHz CW

Rated Power Output	60 watts min.
Input For Rated Output	1 milliwatt max., 0dBm
Power Output @ 3dB compression	Nominal 70 watts / min. 60 watts
Power Output @ 1dB compression	Nominal 60 watts / min. 50 watts
Flatness	±2dB typ. / ±3dB max.
Frequency Response	4.0 - 10.6 GHz instantaneously
Gain (at max. setting)	47.8dB min.
Gain Adjustment (continuous range)	10dB min.
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, nominal
RF Power Display	Digital, forward, and reflected
Third Order Intercept Point	56dBm typ.
Harmonic Distortion	Minus 20dBc max. at 60 watts
Primary Power (selected automatically)	90 - 132, 180 - 264 VAC 50/60 Hz, single phase <1800 watts max.
Connectors	RF input Type N female on front panel RF output Type N female on rear panel External Leveling Inputs Type BNC female on front panel Pulse Modulation Input Type BNC female on front panel Detected RF Output Type BNC female on front panel Standard Remote Interfaces Included
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	148 kg (325 lb)
Size (WxHxD)	56.1 x 152.4 x 67.1 cm / 22.1 x 60 x 26.4 in.



# 6 to 18 GHz



## 80 watts. 4.0-10.6 GHz CW

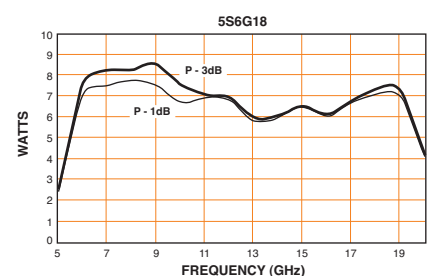
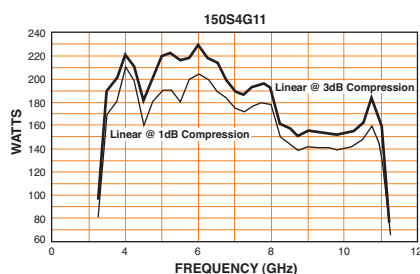
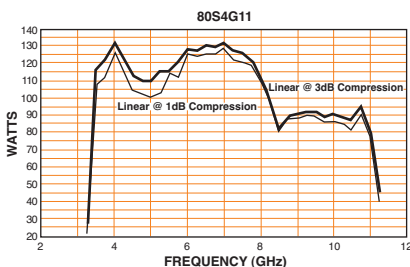
**Rated Power Output** 80 watts min.  
**Input For Rated Output** 1 milliwatt max., 0dBm  
**Power Output @ 3dB compression**  
 Nominal 85 watts / min. 75 watts  
**Power Output @ 1dB compression**  
 Nominal 80 watts / min. 70 watts  
**Flatness** ±2dB typ. / ±3dB max.  
**Frequency Response** 4.0 - 10.6 GHz instantaneously  
**Gain (at max. setting)** 49dB min.  
**Gain Adjustment (continuous range)** 10dB min.  
**Input Impedance** 50 ohms, VSWR 2.5:1 max.  
**Output Impedance** 50 ohms, nominal  
**RF Power Display** Digital, forward, and reflected  
**Third Order Intercept Point** 57dBm typ.  
**Harmonic Distortion** Minus 20dBc max. at 80 watts  
**Primary Power (selected automatically)**  
 90 - 132, 180 - 264 VAC  
 50/60 Hz, single phase  
 <2200 watts max.  
**Connectors**  
 RF input Type N female on front panel  
 RF output Type N female on rear panel  
 External Leveling Inputs Type BNC female on front panel  
 Pulse Modulation Input Type BNC female on front panel  
 Detected RF Output Type BNC female on front panel  
 Standard Remote Interfaces Included  
**Safety Interlock** 15 pin Subminiature D  
**Cooling** Forced air (self contained fans)  
**Weight** 172.4 kg (380 lb)  
**Size (WxHxD)**  
 56.1 x 152.4x 67.1 cm / 22.1 x 60 x 26.4 in.

## 150 watts. 4.0-10.6 GHz CW

**Rated Power Output** 150 watts min.  
**Input For Rated Output** 1 milliwatt max., 0dBm  
**Power Output @ 3dB compression**  
 Nominal 155 watts / min. 145 watts  
**Power Output @ 1dB compression**  
 Nominal 145 watts / min. 135 watts  
**Flatness** ±2.5dB typ. / ±3.5dB max.  
**Frequency Response** 4.0 - 10.6 GHz instantaneously  
**Gain (at max. setting)** 51.8dB min.  
**Gain Adjustment (continuous range)** 10dB min.  
**Input Impedance** 50 ohms, VSWR 2.5:1 max.  
**Output Impedance** 50 ohms, nominal  
**RF Power Display** Digital, forward, and reflected  
**Third Order Intercept Point** 59dBm typ.  
**Harmonic Distortion** Minus 20dBc max. at 150 watts  
**Primary Power (selected automatically)**  
 90 - 132, 180 - 264 VAC  
 50/60 Hz, single phase  
 <4500 watts max.  
**Connectors**  
 RF input Type N female on front panel  
 RF output Type N female on rear panel  
 External Leveling Inputs Type BNC female on front panel  
 Pulse Modulation Input Type BNC female on front panel  
 Detected RF Output Type BNC female on front panel  
 Standard Remote Interfaces Included  
**Safety Interlock** 15 pin Subminiature D  
**Cooling** Forced air (self contained fans)  
**Weight** 345 kg (760 lb)  
**Size (WxHxD) (2 cabinets)**  
 112.3 x 152.4x 67.3 cm / 44.2 x 60 x 26.5 in.

## 5 watts. 6-18 GHz CW

**Rated Power Output** 5 watts min.  
**Input For Rated Output** 1 milliwatt max., 0dBm  
**Power Output @ 3dB compression**  
 Nominal 7 watts / min. 5 watts  
**Power Output @ 1dB compression**  
 Nominal 6 watts / min. 5 watts  
**Flatness** ±2dB typ. / ±3dB max.  
**Frequency Response** 6 -18 GHz instantaneously  
**Gain (at max. setting)** 37dB min.  
**Gain Adjustment (continuous range)** 10dB min.  
**Input Impedance** 50 ohms, VSWR 2.5:1 max.  
**Output Impedance** 50 ohms, nominal  
**Harmonic Distortion** Minus 20dBc max. at 5 watts  
**Third Order Intercept Point** 43dBm typ.  
**Primary Power (selected automatically)**  
 90 - 132, 180 - 264 VAC  
 50/60 Hz, single phase  
 <550 watts max.  
**Connectors**  
 RF input Type N precision female on rear panel  
 RF output Type N precision female on rear panel  
 Standard Remote Interfaces Included  
**Safety Interlock** 15 Pin Subminiature D  
**Cooling** Forced air (self contained fans)  
**Weight** 29 kg (64 lb)  
**Size (WxHxD)**  
 50.3 X 24.9 x 54.6cm / 19.8 x 9.8 x 21.5 in.



# Microwave Amplifiers 6 to 18 GHz



10S6G18A Amplifier

## 10 watts. 6-18 GHz CW

**Rated Power Output** 10 watts min.

**Power Output @ 3dB compression**  
Nominal 13 watts / min. 10 watts

**Power Output @ 1dB compression**  
Nominal 12 watts / min. 9 watts

**Flatness** ±2dB typ. / ±3dB max.

**Frequency Response** 6 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max., 0 dBm

**Gain (at max. setting)** 40dB min.

**Gain Adjustment (continuous range)** 10dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, nominal

**Harmonic Distortion**  
Minus 20dBc max. at 10 watts

**Third Order Intercept Point** 47 dBm typ.

**Primary Power**  
90 - 132, 180 - 264 VAC  
50/60 Hz, single phase  
<550 watts max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type N precision female on rear panel  
Standard Remote Interfaces Included

**Safety Interlock** 15 pin female Subminiature D

**Cooling** Forced air (self contained fans)

**Weight** 32 kg (70 lb)

**Size (WxHxD)**  
50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in.



20S6G18 Amplifier

## 20 watts. 6-18 GHz CW

**Rated Power Output** 20 watts min.

**Power Output @ 3dB compression**  
Nominal 25 watts / min. 20 watts

**Power Output @ 1dB compression**  
Nominal 22 watts / min. 18 watts

**Flatness** ±2dB typ. / ±3dB max.

**Frequency Response** 6 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max., 0 dBm

**Gain (at max. setting)** 44dB min.

**Gain Adjustment (continuous range)** 10dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, nominal

**Harmonic Distortion**  
Minus 20dBc max. at 20 watts

**Third Order Intercept Point** 49 dBm typ.

**Primary Power**  
90 - 132, 180 - 264 VAC  
50/60 Hz, single phase  
<600 watts max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type N precision female on rear panel  
Standard Remote Interfaces Included

**Safety Interlock** 15 pin female Subminiature D

**Cooling** Forced air (self contained fans)

**Weight** 36 kg (79 lb)

**Size (WxHxD)**  
50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in.



40S6G18A Amplifier

## 40 watts. 6-18 GHz CW

**Rated Power Output** 40 watts min.

**Power Output @ 3dB compression**  
Nominal 46 watts / min. 37 watts

**Power Output @ 1dB compression**  
Nominal 40 watts / min. 34 watts

**Flatness** ±2dB typ. / ±3dB max.

**Frequency Response** 6 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max., 0 dBm

**Gain (at max. setting)** 48dB min.

**Gain Adjustment (continuous range)** 10dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, nominal

**Harmonic Distortion**  
Minus 20dBc max. at 40 watts

**Third Order Intercept Point** 52 dBm typ.

**Primary Power**  
90 - 132, 180 - 264 VAC  
50/60 Hz, single phase  
<600 watts max.

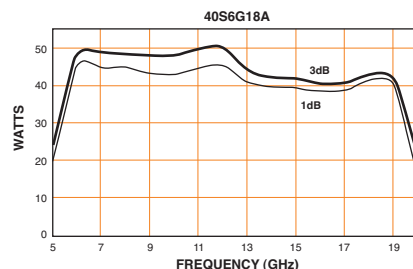
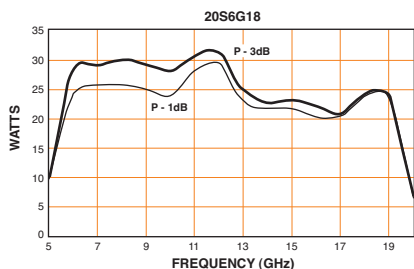
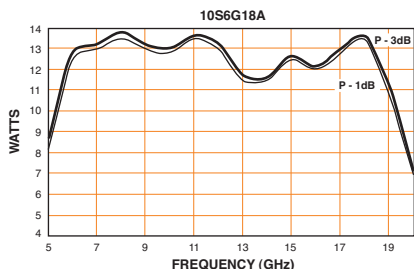
**Connectors**  
RF input Type N precision female on rear panel  
RF output Type N precision female on rear panel  
Standard Remote Interfaces Included

**Safety Interlock** 15 pin Subminiature D

**Cooling** Forced air (self contained fans)

**Weight** 41 kg (90 lb)

**Size (WxHxD)**  
50.3 x 24.9 x 54.6 cm / 19.8 x 9.8 x 21.5 in.



# 0.8 to 18 GHz

## Microwave Amplifiers

### "ST" Series

### The Best of Both Worlds

"ST" Series – Dual-Band Solid State And Traveling Wave Tube Amplifiers 0.8 to 18 GHz

10 to 50 watts.

All our "ST" Series Microwave Amplifiers have modulation capability that will faithfully reproduce AM, FM or Pulse Modulation appearing on the input signal. The AM peak envelope power is limited to specified power.



10 watts. 0.8-18 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 15 watts / min. 10 watts  
 Linear @ 1dB Compression 8 watts min., 0.8 - 4.2 GHz  
 5 watts min., 4.2 - 18 GHz

**Flatness** ±3dB max., 0.8 - 4.2 GHz  
 ±9dB max., 4.2 - 18 GHz

**Frequency Response** 0.8 - 18 GHz in one of four selectable sub-bands

**Input For Rated Output** 1 milliwatt max.  
**Gain (at max. setting)** 40dB min.

**Gain Adjustment (continuous range)**  
 10dB min. 0.8 - 4.2 GHz  
 35dB min. 4.2 - 18 GHz

**Input Impedance** 50 ohms, VSWR 2.5:1 max.  
**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 100% of rated power without foldback from 0.8 - 4.2 GHz.  
 Output power foldback protection above 4.2 GHz at reflected power exceeding 10 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.

**Noise Power Density (from 4.2 - 18 GHz)**  
 Minus 80dBm/Hz (max.), Minus 90dBm/Hz (typ.)

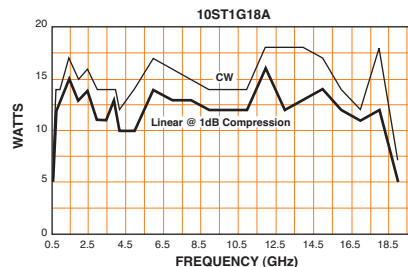
**Harmonic Distortion (in user selectable sub-band at 10 watts)**  
 Minus 20dBc max./Minus 30dBc typ.

**Primary Power**  
 99 - 260 VAC  
 50/60 Hz, single phase  
 700 VA max.

**Connectors**  
 RF input Type N precision female on rear panel  
 RF output Type N precision female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 55 kg (120 lb)  
**Size (WxHxD)**  
 50.3 x 29.7 x 68.6 cm / 19.8 x 11.7 x 27 in.



20 watts. 0.8-18 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 30 watts / min. 20 watts  
 Linear @ 1dB Compression 10 watts min.

**Flatness** ±3dB max., 0.8 - 4.2 GHz  
 ±9dB max., 4.2 - 18 GHz

**Frequency Response** 0.8 - 18 GHz in one of two selectable sub-bands  
 0.8 - 4.2 GHz and 4.2 - 18 GHz

**Input For Rated Output** 1 milliwatt max.  
**Gain (at max. setting)** 43dB min.

**Gain Adjustment (continuous range)**  
 10dB min. 0.8 - 4.2 GHz  
 35dB min. 4.2 - 18 GHz

**Input Impedance** 50 ohms, VSWR 2.0:1 max.  
**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Same as 10ST1G18A with reflected power exceeding 20 watts.

**Noise Power Density (from 4.2 - 18 GHz)**  
 Minus 80dBm/Hz (max.), Minus 90dBm/Hz (typ.)

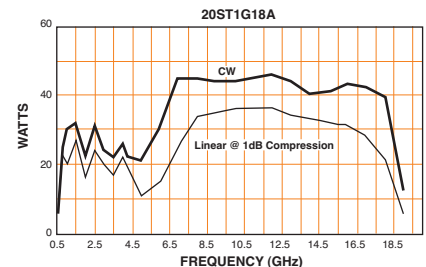
**Harmonic Distortion (at 20 watts)**  
 0.8 - 4.2 GHz; Minus 20dBc max., Minus 30dBc typ.  
 4.2 - 4.5 GHz; Minus 0dBc max., Minus 1dBc typ.  
 4.5 - 5 GHz; Minus 1dBc max., Minus 2dBc typ.  
 5 - 7 GHz; Minus 2.5dBc max., Minus 4dBc typ.  
 7 - 10 GHz; Minus 5dBc max., Minus 9dBc typ.  
 10 - 12 GHz; Minus 8dBc max., Minus 12dBc typ.  
 Above 12 GHz; Minus 20dBc max., Minus 30dBc typ.

**Primary Power**  
 99 - 260 VAC  
 50/60 Hz, single phase  
 700 VA max.

**Connectors**  
 RF input Type N precision female on rear panel  
 RF output Type N precision female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 62 kg (135 lb)  
**Size (WxHxD)**  
 50.3 x 29.7 x 68.6 cm / 19.8 x 11.7 x 27 in.



# Microwave Amplifiers

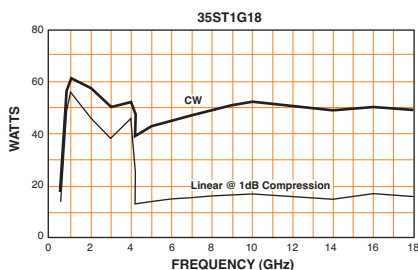
## 0.8 to 18 GHz

### 35ST1G18 Dual-Band Amplifier



#### 35 watts. 0.8-18 GHz CW

<b>Power (fundamental), CW, @ Output Connector</b>	
Nominal	50 watts
Minimum	45 watts from 0.8 - 4.2 GHz 35 watts from 4.2 - 18 GHz
Linear @ 1dB Compression	10 watts min.
Flatness	±3dB max., 0.8 - 4.2 GHz ±10dB max., 4.2 - 18 GHz
Frequency Response	0.8 - 18 GHz in one of four selectable sub-bands
Input For Rated Output	1 milliwatt max.
Gain (at max. setting)	45dB min.
Gain Adjustment (continuous range)	10dB min. 0.8 - 4.2 GHz 35dB min. 4.2 - 18 GHz
Input Impedance	50 ohms, VSWR 2.5:1 max.
Output Impedance	50 ohms, VSWR 2.5:1 typ.
Mismatch Tolerance	100% of rated power without foldback from 0.8 - 4.2 GHz. Output power foldback protection above 4.2 GHz at reflected power exceeding 20 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.
Noise Power Density (from 4.2 - 18 GHz)	Minus 80dBm/Hz (max.), Minus 90dBm/Hz (typ.)
Harmonic Distortion (in user selectable sub-band at 35 watts)	Minus 20dBc max./Minus 30dBc typ.
Primary Power	99 - 260 VAC 50/60 Hz, single phase 1400 VA max.
Connectors	RF input Type N precision female on rear panel RF output Type N precision female on rear panel RF output sample port Type N precision female on rear panel Interlock DB-15 female on rear panel GPIO IEEE-488 female on rear panel
Cooling	Forced air (self contained fans), air entry and exit in rear.
Weight	84 kg (185 lb)
Size (WxHxD)	50.3 x 48 x 74 cm / 19.8 x 19 x 29 in.

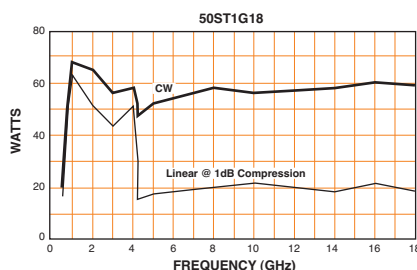


### 50ST1G18 Dual-Band Amplifier



#### 50 watts. 0.8-18 GHz CW

<b>Power (fundamental), CW, @ Output Connector</b>	
Nominal	50 watts
Minimum	50 watts from 0.8 - 4.2 GHz 45 watts from 4.2 - 6 GHz 50 watts from 6 - 18 GHz
Linear @ 1dB Compression	10 watts min.
Flatness	±3dB max., 0.8 - 4.2 GHz ±10dB max., 4.2 - 18 GHz
Frequency Response	0.8 - 18 GHz in one of two selectable sub-bands
Input For Rated Output	1 milliwatt max.
Gain (at max. setting)	47dB min.
Gain Adjustment (continuous range)	10dB min. 0.8 - 4.2 GHz 35dB min. 4.2 - 18 GHz
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, VSWR 2.5:1 typ.
Mismatch Tolerance	Same as 35ST1G18 mismatch tolerance.
Noise Power Density (from 4.2 - 18 GHz)	Minus 80dBm/Hz (max.), Minus 90dBm/Hz (typ.)
Harmonic Distortion (at 50 watts)	0.8 - 4.2 GHz; Minus 20dBc max., Minus 30dBc typ. 4.2 - 4.5 GHz; Plus 2.5dBc max., Minus 0dBc typ. 4.5 - 6 GHz; Plus 0.5dBc max., Minus 1dBc typ. 6 - 8 GHz; Minus 4dBc max., Minus 6dBc typ. 8 - 10 GHz; Minus 6dBc max., Minus 9dBc typ. Above 10 GHz; Minus 10dBc max., Minus 15dBc typ.
Primary Power	99 - 260 VAC 50/60 Hz, single phase 1400 VA max.
Connectors	RF input Type N precision female on rear panel RF output Type N precision female on rear panel RF output sample port Type N precision female on rear panel Interlock DB-15 female on rear panel GPIO IEEE-488 female on rear panel
Cooling	Forced air (self contained fans), air entry and exit in rear.
Weight	80 kg (175 lb)
Size (WxHxD)	50.3 x 48 x 74 cm / 19.8 x 19 x 29 in.



# 1 to 2.5 GHz

**Microwave Amplifiers  
"T" and "TP"  
Traveling Wave Tube  
Amplifier Series:  
More Power, Higher  
Frequencies & Features  
That Make Testing  
Quicker, Easier,  
More Accurate**

**"T" Series—TWTA's.  
0.8 to 45 GHz.  
15 to 2000 watts.**

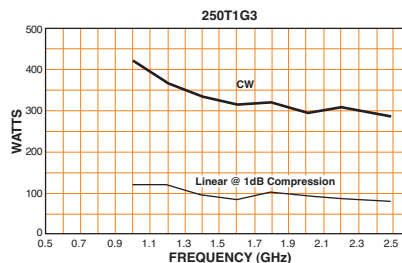
**"TP" Series—Pulsed TWTA's.  
1 to 18 GHz.  
1000 to 10,000 watts.**

All our "T" and "TP" Series Continuous Wave Microwave Amplifiers have modulation capability that will faithfully reproduce AM, FM or Pulse Modulation appearing on the input signal. The AM peak envelope power is limited to specified power.



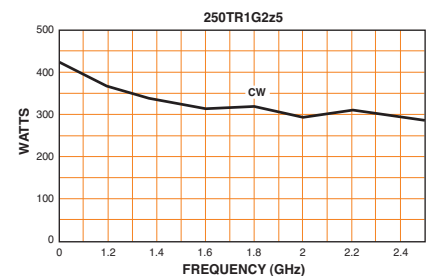
**250 watts. 1-2.5 GHz CW**

<b>Power (fundamental), CW/Pulse @ Output Connector</b>	
Nominal	300 watts / min. 250 watts
Linear @ 1dB Compression	70 watts min.
<b>Flatness</b>	±12dB max., equalized for ±5dB max. at rated power
<b>Frequency Response</b>	1 - 2.5 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	53dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.
<b>Mismatch Tolerance</b>	
Output power foldback protection at reflected power exceeding 50 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.	
<b>Video Pulse Capability</b>	
Pulse Width	0.05 microseconds min.
Pulse Rate (PRF)	100 kHz max.
RF Rise and Fall	30 ns max. (10% to 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse Width Distortion	±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)
<b>Noise Power Density</b>	
(pulse on)	Minus 72dBm/Hz max., Minus 77dBm/Hz typ.
(pulse off)	Minus 140dBm/Hz typ.
<b>Harmonic Distortion</b>	Minus 3dBc max., Minus 4.5dBc typ.
<b>Primary Power</b>	
190 - 260 VAC	
50/60 Hz, single phase	
2.5 kVA max.	
<b>Connectors</b>	
RF input	Type N female on rear panel
RF output	Type N female on rear panel
RF output sample port	Type N female on rear panel
Interlock	DB-15 female on rear panel
Video	BNC-female on rear panel
GPIB	IEEE-488 female on rear panel
<b>Cooling</b>	
Forced air (self contained fans), air entry and exit in rear.	
<b>Weight</b>	59 kg (130 lb)
<b>Size (WxHxD)</b>	
50.3 x 29.7 x 76.2 cm / 19.8 x 11.7 x 30 in.	



**250 watts. 1-2.5 GHz CW**

<b>Power (fundamental), CW/Pulse @ Output Flange</b>	
Nominal	300 watts / min. 250 watts
<b>Flatness</b>	±12dB max.
<b>Frequency Response</b>	1 - 2.5 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	53dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.
<b>Mismatch Tolerance</b>	
Output power foldback protection at reflected power exceeding 50 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.	
<b>Noise Power Density</b>	
Minus 72dBm/Hz max., Minus 77dBm/Hz typ.	
<b>Harmonic Distortion</b>	Minus 3dBc max., Minus 4.5dBc typ.
<b>Primary Power</b>	
190 - 260 VAC	
50/60 Hz, single phase	
2.5 kVA max.	
<b>Connectors</b>	
RF input	Type N female on rear panel
RF output	Type N female on rear panel
RF output sample port	Type N female on rear panel
Interlock	DB-15 female on rear panel
GPIB	IEEE-488 female on rear panel
<b>Cooling</b>	
Forced air (self contained fans), air entry and exit in rear.	
<b>Weight</b>	46 kg (100 lb)
<b>Size (WxHxD)</b>	
48.3 x 26.7 x 76.2 cm / 19 x 10.5 x 30 in.	
For 19 inch rack mounting; includes four side-mounted carrying handles, plus non-slip feet for benchtop use.	



# Microwave Amplifiers 1 to 2.5 GHz

500T1G2 TWT Amplifier



## 500 watts. 1-2.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 537 watts / min. 500 watts  
 Linear @ 1dB Compression 125 watts min.

**Flatness**  
 ±8dB max., equalized for ±5dB max. at rated power

**Frequency Response** 1 - 2.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 57dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 100 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.

**Noise Power Density**  
 Minus 80dBm/Hz max., Minus 87dBm/Hz typ.

**Harmonic Distortion**  
 Minus 3dBc max., Minus 4dBc typ.

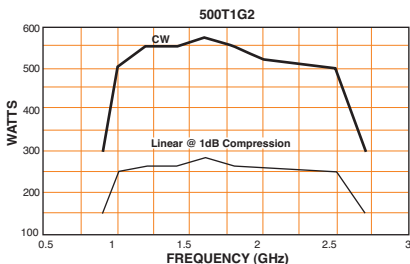
**Primary Power**  
 208 VAC ±10%  
 50/60 Hz, three phase  
 3.3 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type 7-16 DIN female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 71 kg (155 lb)

**Size (WxHxD)**  
 50.3 x 25.4 x 83.8 cm / 19.8 x 10 x 33 in.



1000T1G2z5 TWT Amplifier



## 1000 watts. 1-2.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 1100 watts / min. 1000 watts

**Flatness**  
 ±15dB max., equalized for ±8dB max. at rated power

**Frequency Response** 1 - 2.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 200 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.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 80dBm/Hz typ.

**Harmonic Distortion**  
 Minus 0dBc max., Minus 3dBc typ.

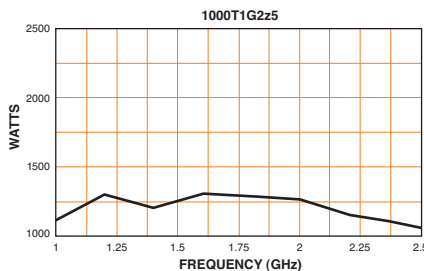
**Primary Power**  
 208 ±10% VAC  
 50/60 Hz, three phase, delta (4 wire)  
 8 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type 7-16 DIN female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 55 kg (120 lb)

**Size (WxHxD)**  
 50.8 x 25.4 x 68.6 cm / 20 x 10 x 27 in.



1700T1G2z5 TWT Amplifier



## 1700 watts. 1-2.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 2000 watts  
 Min. 1700 watts

**Flatness**  
 ±15dB max., equalized for ±8dB max. at rated power

**Frequency Response** 1 - 2.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 62dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 400 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.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 80dBm/Hz typ.

**Harmonic Distortion**  
 Minus 15dBc max., Minus 20dBc typ.

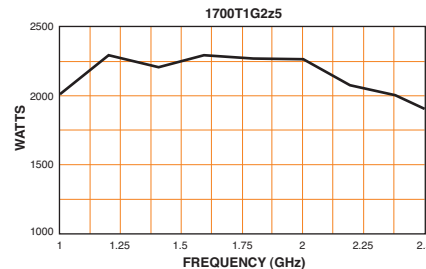
**Primary Power**  
 208 ±10% VAC  
 50/60 Hz, three phase, delta (4 wire) or WYE (5 wire)  
 16 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type 1 5/8 EIA on rear panel  
 RF output sample ports (forward and reflected) Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 273 kg (600 lb)

**Size (WxHxD)**  
 56 x 160 x 82.3 cm / 22.1 x 63 x 32.4 in.



# 2 to 4 GHz

# 2.5 to 7.5 GHz



2000T1G3 TWT Amplifier

## 2000 watts. 1-2.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 2200 watts  
 Min. 2000 watts  
 Linear @ 1dB Compression 500 watts min.

**Flatness** ±8dB max., equalized for ±5dB max. at rated power

**Frequency Response** 1 - 2.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 63dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 400 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.

**Noise Power Density**  
 Minus 90dBm/Hz max., Minus 95dBm/Hz typ.

**Harmonic Distortion**  
 Minus 20dBc max., Minus 22dBc typ.

**Primary Power**  
 190 - 255 VAC  
 50/60 Hz, three phase, delta (4 wire)  
 24 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type 1 5/8 EIA  
 RF output sample ports (forward and reflected) Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 954 kg (2100 lb)

**Size (WxHxD)**  
 56 x 160 x 82.3 cm / 22.1 x 63 x 32.4 in.



1000T2G4 TWT Amplifier

## 1000 watts. 2-4 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 1300 watts / min. 1000 watts  
 Linear @ 1dB Compression 250 watts min.

**Flatness** ±4 dB max., ±3 dB max. at rated power

**Frequency Response** 2 - 4 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 200 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.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 77dBm/Hz typ.

**Harmonic Distortion**  
 Minus 6dBc max., Minus 10dBc typ.

**Primary Power**  
 190 - 255 VAC  
 50/60 Hz, three phase, delta (4 wire)  
 8 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output 1 5/8" EIA on rear panel  
 RF output sample ports (forward and reflected) Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 318 kg (700 lb)

**Size (WxHxD)**  
 56 x 183 x 82.3 cm / 22.1 x 72 x 32.4 in.



200T2G8A TWT Amplifier

## 200 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW/Pulse @ Output Connector**  
 Nominal 267 watts / min. 200 watts  
 Linear @ 1dB Compression 100 watts min.

**Flatness** ±12dB max, equalized for ±5dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 53dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 40 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.

**Video Pulse Capability**  
 Pulse Width 0.05 microseconds min.  
 Pulse Rate (PRF) 100 kHz max.  
 RF Rise and Fall 30 ns max. (10% to 90%)  
 Delay 300ns max. from pulse input to RF 90%  
 Pulse width distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)

**Noise Power Density**  
 (pulse on) Minus 69dBm/Hz max., Minus 72dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 2dBc max., Minus 3.5dBc typ.

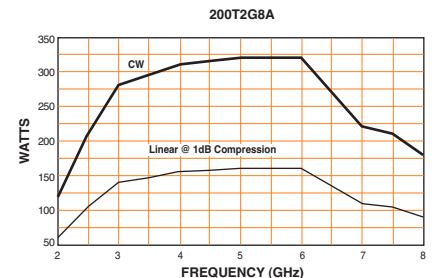
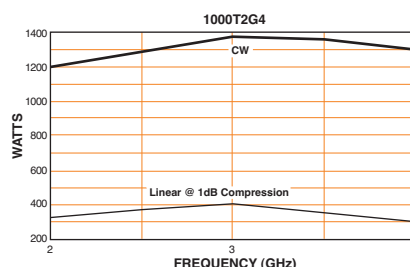
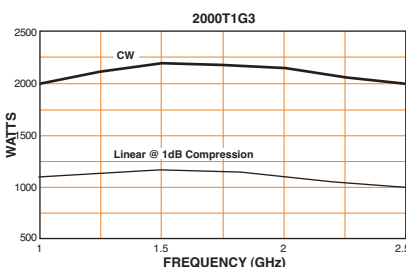
**Primary Power**  
 190 - 260 VAC  
 50/60 Hz, single phase  
 2 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 Video BNC-female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 54 kg (120 lb)

**Size (WxHxD)**  
 50.3 x 29.7 x 68.6 cm / 19.8 x 11.7 x 27 in.



# Microwave Amplifiers 2.5 to 7.5 GHz

300T2G8 TWT Amplifier



## 300 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW/Pulse @ Output Connector**  
 Nominal 350 watts / min. 300 watts  
 Linear @ 1dB Compression 75 watts min.

**Flatness** ±12dB max, equalized for ±5dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 55dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 60 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.

**Video Pulse Capability**  
 Pulse Width 0.05 microseconds min.  
 Pulse Rate (PRF) 100 kHz max.  
 RF Rise and Fall 30 ns max. (10% to 90%)  
 Delay 300 ns max. from pulse input to RF 90%  
 Pulse width distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)

**Noise Power Density (pulse on)** Minus 85dBm/Hz max., Minus 90dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 3dBc max., Minus 4.5dBc typ.

**Primary Power**  
 190 - 260 VAC  
 50/60 Hz, single phase  
 3 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 Video BNC-female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 54 kg (120 lb)

**Size (WxHxD)**  
 50.3 x 29.7 x 68.6 cm / 19.8 x 11.7 x 27 in.

300TR2z5G7z5 TWT Amplifier



## 300 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW@ Output Flange**  
 Nominal 350 watts / min. 300 watts

**Flatness** ±12dB max.

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 55dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 60 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.

**Noise Power Density**  
 Minus 85dBm/Hz max., Minus 90dBm/Hz typ.

**Harmonic Distortion** Minus 3dBc max., Minus 4.5dBc typ.

**Primary Power**  
 190 - 260 VAC  
 50/60 Hz, single phase  
 3 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 41 kg (90 lb)

**Size (WxHxD)**  
 48.3 x 26.7 x 68.6 cm / 19 x 10.5 x 27 in.

For 19 inch rack mounting; includes four side-mounted carrying handles, plus non-slip feet for benchtop use.

500T2z5G7z5 TWT Amplifier



## 500 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 541 watts / min. 500 watts  
 Linear @ 1dB Compression 125 watts min.

**Flatness** ±8dB max., equalized for ±5dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 57dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 100 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.

**Noise Power Density**  
 Minus 85dBm/Hz max., Minus 95dBm/Hz typ.

**Harmonic Distortion**  
 Minus 3dBc max., Minus 3.5dBc typ.

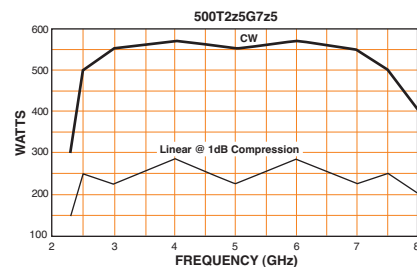
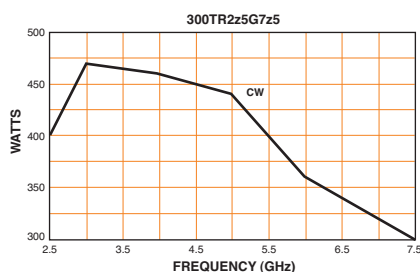
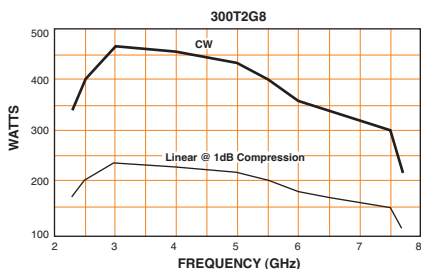
**Primary Power**  
 208 VAC ±10%  
 50/60 Hz, three phase  
 3.5 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output 7-16 DIN female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 55 kg (120 lb)

**Size (WxHxD)**  
 50.8 x 25.4 x 68.6 cm / 20 x 10 x 27 in.





1000T2G8B TWT Amplifier

1000 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 1100 watts / min. 900 watts, 2.5 - 2.7 GHz,  
 1000 watts, 2.7 - 7.5 GHz  
 Linear @ 1dB Compression 250 watts min.

**Flatness**  
 ±8dB max., equalized for ±3dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 200 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.

**Noise Power Density**  
 Minus 80dBm/Hz max., Minus 90dBm/Hz typ.

**Harmonic Distortion**  
 Minus 15dBc max., Minus 17dBc typ.

**Primary Power**  
 190 - 255 VAC  
 50/60 Hz, three phase, delta (4 wire)  
 8.0 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type WRD-250D30 waveguide flange on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 295 kg (650 lb)

**Size (WxHxD)**  
 56 x 160 x 82.3 cm / 22.1 x 63 x 32.4 in.



1500T2G8A TWT Amplifier

1500 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 2000 watts / min. 1600 watts, 2.5 - 3 GHz,  
 1700 watts, 3 - 7.5 GHz  
 Linear @ 1dB Compression 400 watts min.

**Flatness**  
 ±8dB max., equalized for ±6dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 62dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 300 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.

**Noise Power Density**  
 Minus 85dBm/Hz max., Minus 95dBm/Hz typ.

**Harmonic Distortion**  
 Minus 15dBc max., Minus 17dBc typ.

**Primary Power**  
 190 - 255 VAC  
 50/60 Hz, three phase, delta (4 wire)  
 11 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type WRD-250D30 waveguide flange on rear panel  
 RF output sample ports (forward and reflected) Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 296 kg (650 lb)

**Size (WxHxD)**  
 56 x 160 x 82.3 cm / 22.1 x 63 x 32.4 in.



2000T2G8 TWT Amplifier

2000 watts. 2.5-7.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 2200 watts / min. 2000 watts  
 Linear @ 1dB Compression 500 watts min.

**Flatness**  
 ±8dB max., equalized for ±5dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 63dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 400 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.

**Noise Power Density**  
 Minus 85dBm/Hz max., Minus 95dBm/Hz typ.

**Harmonic Distortion**  
 Minus 15dBc max., Minus 22dBc typ., minus 20 dBc max. when used with supplied external filter.

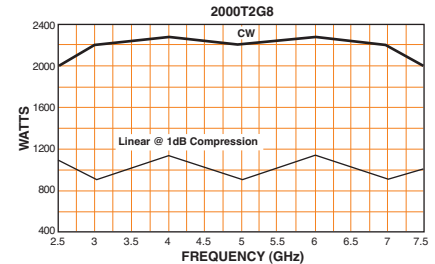
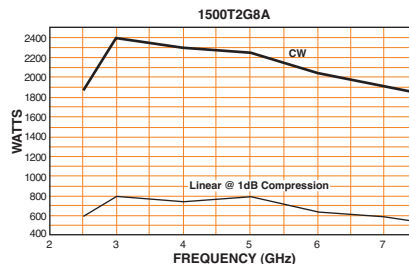
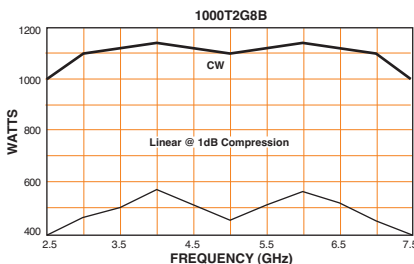
**Primary Power**  
 190 - 255 VAC  
 50/60 Hz, three phase, delta (4 wire)  
 22 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type WRD-250D30 waveguide flange on rear panel  
 RF output sample ports (forward and reflected) Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 409 kg (900 lb)

**Size (WxHxD) (2 cabinets)**  
 56 x 150 x 82.3 cm (22.1 x 59 x 32.4 in)





200T4G8 TWT Amplifier

### 200 watts. 4.0-8.0 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 262 watts / min. 200 watts  
 Linear @ 1dB Compression 100 watts min.

**Flatness** ±6dB max. at rated power

**Frequency Response** 4.0 - 8.0 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 53dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 40 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.

**Noise Power Density**  
 Minus 64dBm/Hz max., Minus 70dBm/Hz typ.

**Harmonic Distortion**  
 Minus 4dBc max., Minus 7dBc typ.

**Primary Power**  
 190-260 VAC  
 50/60 Hz, single phase  
 2.0 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 54 kg (120 lb)

**Size (WxHxD)**  
 50.3 x 29.7 x 68.6 cm / 19.8 x 11.7 x 27 in.



200TR4G8 TWT Amplifier

### 200 watts. 4.0-8.0 GHz CW

**Power (fundamental), CW, @ Output Flange**  
 Nominal 262 watts / min. 200 watts

**Flatness** ±12dB max.

**Frequency Response** 4.0 - 8.0 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 53dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 40 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.

**Noise Power Density**  
 Minus 64dBm/Hz max., Minus 70dBm/Hz typ.

**Harmonic Distortion**  
 Minus 4dBc max., Minus 7dBc typ.

**Primary Power**  
 190-260 VAC  
 50/60 Hz, single phase  
 2.0 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 41 kg (90 lb)

**Size (WxHxD)**  
 48.3 x 26.7 x 68.6 cm / 19 x 10.5 x 27 in.

For 19 inch rack mounting; includes four side-mounted carrying handles, plus non-slip feet for benchtop use.



15T4G18A TWT Amplifier

### 15 watts. 4.2-18 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 40 watts / min. 15 watts,  
 10 watts in low harmonic mode  
 Linear @ 1dB Compression 7 watts min.

**Flatness** ±9dB max., 4.2 - 18 GHz / ±5dB max., 8 - 18 GHz

**Frequency Response**  
 4.2 - 18 GHz instantaneously or one of three selectable sub-bands in low harmonic mode

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 41dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 20 watts (10 watts in low harmonic mode). 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.

**Noise Power Density**  
 Minus 80dBm/Hz max., Minus 90dBm/Hz typ.

**Harmonic Distortion**  
 (in user selectable sub-band at 10 watts)  
 Minus 20dBc max., Minus 30dBc typ.

**Harmonic Distortion (full band at 15 watts)**  
 4.2 - 4.5 GHz; Minus 0dBc max. / Minus 1dBc typ.  
 4.5 - 5 GHz; Minus 1dBc max. / Minus 2dBc typ.  
 5 - 7 GHz; Minus 2.5dBc max. / Minus 4dBc typ.  
 7 - 10 GHz; Minus 5dBc max., / Minus 9dBc typ.  
 10 - 12 GHz; Minus 8dBc max. / Minus 12dBc typ.  
 Above 12 GHz; Minus 20dBc max. / Minus 30dBc typ.

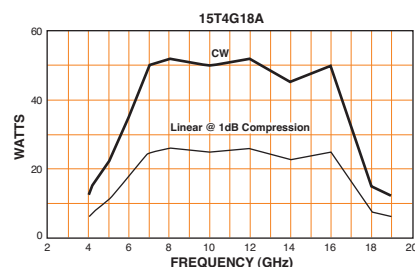
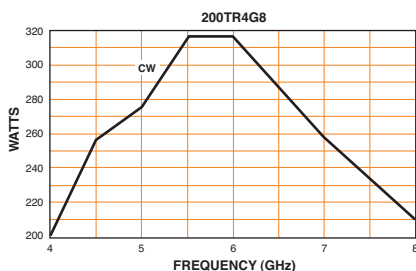
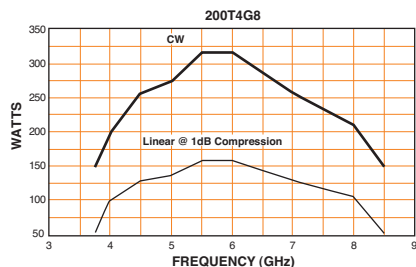
**Primary Power**  
 99 - 260 VAC, 50/60 Hz, single phase, 600 VA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 32 kg (70 lb)

**Size (WxHxD)**  
 50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



### 20T4G18A TWT Amplifier



#### 20 watts. 4.2-18 GHz CW

<b>Power (fundamental), CW, @ Output Connector</b>	
Nominal 42 watts / min. 20 watts	10 watts min.
Linear @ 1dB Compression	
<b>Flatness</b>	±9dB max., 4.2 - 18 GHz ±5dB max., 8.0 - 18 GHz
<b>Frequency Response</b>	4.2 - 18 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	43dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 20 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.

**Noise Power Density**  
Minus 80dBm/Hz max., Minus 90dBm/Hz typ.

**Harmonic Distortion (at 20 watts)**  
4.2 - 4.5 GHz; Minus 0dBc max. / Minus 1dBc typ.  
4.5 - 5 GHz; Minus 1dBc max. / Minus 2dBc typ.  
5 - 7 GHz; Minus 2.5dBc max. / Minus 4dBc typ.  
7 - 10 GHz; Minus 5dBc max. / Minus 9dBc typ.  
10 - 12 GHz; Minus 8dBc max. / Minus 12dBc typ.  
Above 12 GHz; Minus 20dBc max. / Minus 30dBc typ.

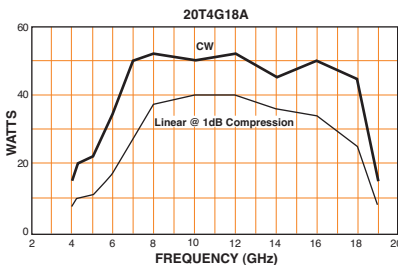
**Primary Power**  
99-260 VAC  
50/60 Hz, single phase  
600 VA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type N female on rear panel  
RF output sample port Type N female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 32 kg (70 lb)

**Size (WxHxD)**  
50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



### 40T4G18 TWT Amplifier



#### 40 watts. 4.2-18 GHz CW

<b>Power (fundamental), CW, @ Output Connector</b>	
Nominal 50 watts / min. 40 watts,	30 watts in low harmonic mode
Linear @ 1dB Compression	10 watts min.
<b>Flatness</b>	±10dB max., 4.2 - 18 GHz
<b>Frequency Response</b>	4.2 - 18 GHz instantaneously or one of three selectable sub-bands in low harmonic mode
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	46dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 20 watts (13 watts in low harmonic mode). 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.

**Noise Power Density**  
Minus 80dBm/Hz max., Minus 90dBm/Hz typ.

**Harmonic Distortion**  
(in user selectable sub-band at 30 watts)  
Minus 20dBc max., Minus 30dBc typ.

**Harmonic Distortion (full band at 40 watts)**  
4.2 - 4.5 GHz; Plus 2.5dBc max., Minus 0dBc typ.  
4.5 - 6 GHz; Plus 0.5dBc max., Minus 1dBc typ.  
6 - 8 GHz; Minus 4dBc max., Minus 6dBc typ.  
8 - 10 GHz; Minus 6dBc max., Minus 9dBc typ.  
Above 10 GHz; Minus 10dBc max., Minus 15dBc typ.

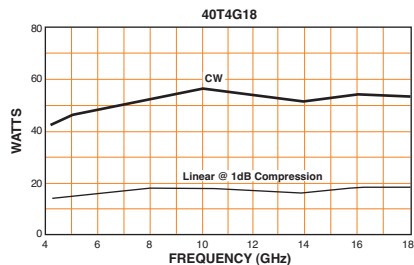
**Primary Power**  
99 - 260 VAC  
50/60 Hz, single phase  
800 VA max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type N precision female on rear panel  
RF output sample port Type N precision female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 39 kg (85 lb)

**Size (WxHxD)**  
50.3 x 26 x 68.6 cm / 19.8 x 10 x 27 in.



### 50T4G18 TWT Amplifier



#### 50 watts. 4.2-18 GHz CW

<b>Power (fundamental), CW, @ Output Connector</b>	
Nominal 60 watts / min. 50 watts	10 watts min.
Linear @ 1dB Compression	
<b>Flatness</b>	±10dB max., 4.2 - 18 GHz
<b>Frequency Response</b>	4.2 - 18 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	47dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 20 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.

**Noise Power Density**  
Minus 80dBm/Hz max., Minus 90dBm/Hz typ.

**Harmonic Distortion (at 50 watts)**  
4.2 - 4.5 GHz; Plus 2.5dBc max., Minus 0dBc typ.  
4.5 - 6 GHz; Plus 0.5dBc max., Minus 1dBc typ.  
6 - 8 GHz; Minus 4dBc max., Minus 6dBc typ.  
8 - 10 GHz; Minus 6dBc max., Minus 9dBc typ.  
Above 10 GHz; Minus 10dBc max., Minus 15dBc typ.

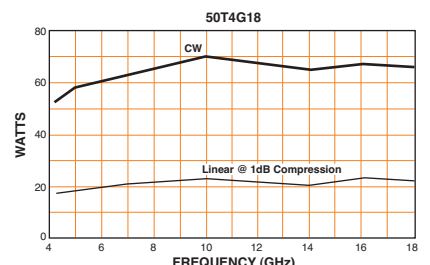
**Primary Power**  
99 - 260 VAC  
50/60 Hz, single phase  
800 VA max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type N precision female on rear panel  
RF output sample port Type N precision female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 32 kg (70 lb)

**Size (WxHxD)**  
50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



# Microwave Amplifiers

## 7.5 to 18 GHz

250T8G18 TWT Amplifier



### 250 watts. 7.5-18 GHz CW

#### Power (fundamental), CW/Pulse @ Output Connector

Nominal 300 watts / min. 250 watts	
Linear @ 1dB Compression	70 watts min.
<b>Flatness</b>	±12dB max., equalized for ±5dB max. at rated power
<b>Frequency Response</b>	7.5 - 18 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	54dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.

#### Mismatch Tolerance

Output power foldback protection at reflected power exceeding 50 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.

#### Video Pulse Capability

Pulse Width	0.05 microseconds min.
Pulse Rate (PRF)	100 kHz max.
RF Rise and Fall	30 ns max. (10% to 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse width distortion	±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)

#### Noise Power Density

(pulse on) Minus 70dBm/Hz max., Minus 72dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

#### Harmonic Distortion

Below 10 GHz, Minus 5dBc max., Minus 7dBc typ.  
10 - 12 GHz, Minus 8dBc max., Minus 12dBc typ.  
Above 12 GHz, Minus 20dBc max., Minus 30dBc typ.

#### Primary Power

190 - 260 VAC, 50/60 Hz, single phase, 2.5 kVA max.

#### Connectors

RF input	Type N female on rear panel
RF output	Type WRD-750D24 waveguide flange on rear panel
RF output sample port	Type N female on rear panel
Interlock	DB-15 female on rear panel
Video	BNC-female on rear panel
GPIB	IEEE-488 female on rear panel

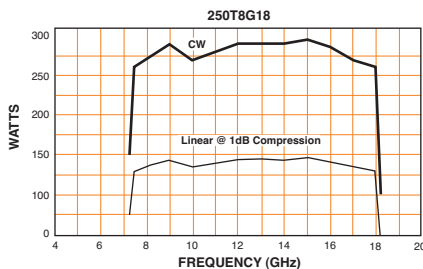
#### Cooling

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

**Weight** 53 kg (115 lb)

#### Size (WxHxD)

50.3 x 29.7 x 68.6 cm / 19.8 x 11.7 x 27 in.



250TR7z5G18 TWT Amplifier



### 250 watts. 7.5-18 GHz CW

#### Power (fundamental), CW @ Output Flange

Nominal 280 watts / min. 250 watts	
Flatness	±12dB max.
<b>Frequency Response</b>	7.5 - 18 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	54dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.

#### Mismatch Tolerance

Output power foldback protection at reflected power exceeding 50 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.

#### Noise Power Density

Minus 70dBm/Hz max., Minus 72dBm/Hz typ.

#### Harmonic Distortion

Below 10 GHz, Minus 5dBc max., Minus 7dBc typ.  
10 - 12 GHz, Minus 8dBc max., Minus 12dBc typ.  
Above 12 GHz, Minus 20dBc max., Minus 30dBc typ.

#### Primary Power

190 - 260 VAC  
50/60 Hz, single phase  
2.5 kVA max.

#### Connectors

RF input	Type N precision female on rear panel
RF output	Type WRD-750D24 waveguide flange on rear panel
RF output sample port	Type N precision female on rear panel
Interlock	DB-15 female on rear panel
GPIB	IEEE-488 female on rear panel

#### Cooling

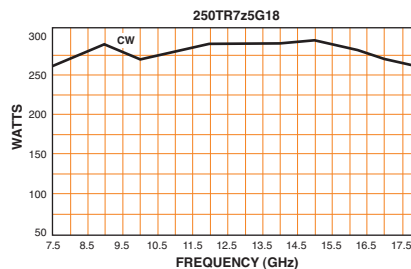
Forced air (self contained fans), air entry and exit in rear.

**Weight** 39 kg (85 lb)

#### Size (WxHxD)

48.3 x 26.7 x 68.6 cm / 19 x 10.5 x 27 in.

For 19 inch rack mounting; includes four side-mounted carrying handles, plus non-slip feet for benchtop use.



300T7z5G18 TWT Amplifier



### 300 watts. 7.5-18 GHz CW

#### Power (fundamental), CW @ Output Flange

Nominal 350 watts	
Min. 285 watts 7.5 - 8GHz, 300 watts 8 - 18GHz	
Linear @ 1dB Compression	75 watts min.
<b>Flatness</b>	±12dB max., equalized for ±5dB max. at rated power
<b>Frequency Response</b>	7.5 - 18 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	55dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.0:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.

#### Mismatch Tolerance

Output power foldback protection at reflected power exceeding 60 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.

#### Video Pulse Capability

Pulse Width	0.5 microseconds min.
Pulse Rate (PRF)	100 kHz max.
RF Rise and Fall	30 ns max. (10% to 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse width distortion	±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)

#### Noise Power Density

(pulse on) Minus 65dBm/Hz max., Minus 70dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

#### Harmonic Distortion

Minus 2dBc max., Minus 5dBc typ.

#### Primary Power

190 - 260 VAC, 50/60 Hz, single phase, 2 kVA max.

#### Connectors

RF input	Type N precision female on rear panel
RF output	Type WRD-750D24 waveguide flange on rear panel
RF output sample port	Type N precision female on rear panel
Interlock	DB-15 female on rear panel
Video	BNC-female on rear panel
GPIB	IEEE-488 female on rear panel

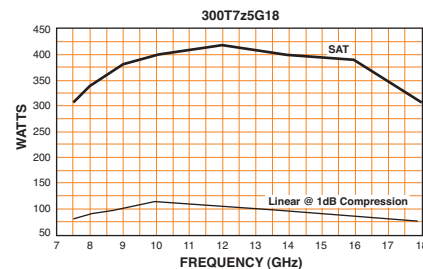
#### Cooling

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

**Weight** 52 kg (115 lb)

#### Size (WxHxD)

50.3 x 31 x 68.6 cm / 19.8 x 12 x 27 in.





**300 watts. 7.5-18 GHz CW**

**Power (fundamental), CW @ Output Connector**  
 Nominal 350 watts  
 Min. 285 watts 7.5 - 8GHz, 300 watts 8 - 18GHz

**Flatness** ±12dB max.

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 55dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 60 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.

**Noise Power Density**  
 Minus 65dBm/Hz max., Minus 70dBm/Hz typ.

**Harmonic Distortion**  
 Minus 2dBc max., Minus 5dBc typ.

**Primary Power**  
 190 - 260 VAC  
 50/60 Hz, single phase  
 2 kVA max.

**Connectors**  
 RF input Type N precision female on rear panel  
 RF output Type WRD-750D24 waveguide flange on rear panel  
 RF output sample port Type N precision female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 39 kg (85 lb)

**Size (WxHxD)**  
 48.3 x 26.7 x 68.6 cm / 19 x 10.5 x 27 in.

For 19 inch rack mounting; includes four side-mounted carrying handles, plus non-slip feet for benchtop use.



**500 watts. 7.5-18 GHz CW**

**Power (fundamental), CW, @ Output Connector**  
 Nominal 550 watts / min. 500 watts  
 Linear @ 1dB Compression 125 watts min.

**Flatness** ±11dB max., equalized for ±3dB max. at rated power

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 57dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 100 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.

**Modulation Capability**  
 Will faithfully reproduce AM, FM, or pulse modulation appearing on the input signal. AM peak envelope power limited to specified power.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 72dBm/Hz typ.

**Harmonic Distortion**  
 Minus 20dBc max., Minus 22dBc typ.

**Primary Power**  
 208 VAC ±10%  
 50/60 Hz, three phase  
 4 kVA max.

**Connectors**  
 RF input Type N precision female on rear panel  
 RF output Type WRD-750D24 waveguide flange on rear panel  
 RF output sample port Type N precision female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 91 kg (200 lb)

**Size (WxHxD)**  
 50.3 x 40.6 x 68.6 cm / 19.8 x 16 x 27 in.



**1000 watts. 7.5-18 GHz CW**

**Power (fundamental), CW, @ Output Connector**  
 Nominal 1100 watts  
 Min. 1000 watts 7.5 - 17 GHz, 925 watts 17 - 18 GHz  
 Linear @ 1dB Compression 250 watts min.

**Flatness** ±11dB max., equalized for ±3dB max. at rated power

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 200 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.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 72dBm/Hz typ.

**Harmonic Distortion**  
 Minus 20dBc max., Minus 27dBc typ.

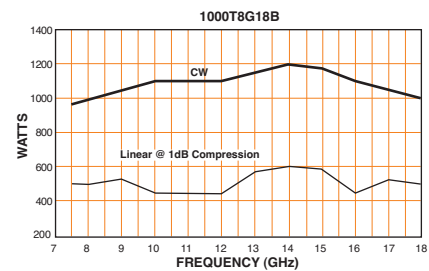
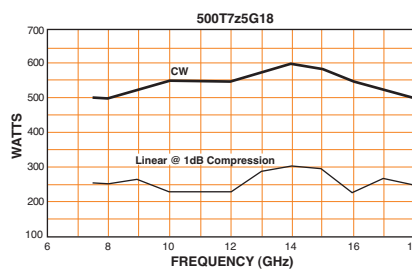
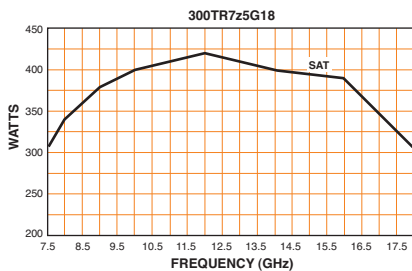
**Primary Power**  
 190 - 255 VAC  
 50/60 Hz, three phase, delta (4 wire)  
 8 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type WRD-750D24 waveguide flange on rear panel  
 RF output sample port Type N female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 295 kg (650 lb)

**Size (WxHxD)**  
 56 x 160 x 82.3 cm / 22.1 x 63 x 32.4 in.



# Microwave Amplifiers 7.5 to 18 GHz

# 18 to 26.5 GHz



1500T8G18 TWT Amplifier

## 1500 watts. 7.5-18 GHz CW

**Power (fundamental), CW, @ Output Connector**  
Nominal 2000 watts / Min. 1500 watts  
Linear @ 1dB Compression 375 watts min.

**Flatness**  
±11dB max., equalized for ±6dB max. at rated power

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 62dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 300 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.

**Noise Power Density**  
Minus 70dBm/Hz max., Minus 72dBm/Hz typ.

**Harmonic Distortion**  
Minus 20dBc max., Minus 27dBc typ.

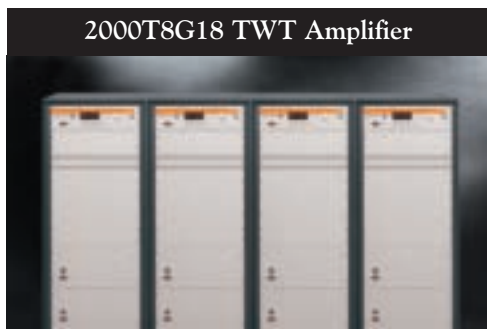
**Primary Power**  
190 - 255 VAC  
50/60 Hz, three phase, delta (4 wire)  
16 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type WRD-750D24 waveguide flange on rear panel  
RF output sample ports (forward and reverse)  
Interlock Type N female on rear panel  
GPIO DB-15 female on rear panel  
GPIO IEEE-488 female on rear panel

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

**Weight** 546 kg (1200 lb)

**Size (WxHxD) (2 cabinets)**  
56 x 160 x 84 cm / 22.1 x 63 x 33 in. per cabinet



2000T8G18 TWT Amplifier

## 2000 watts. 7.5-18 GHz CW

**Power (fundamental), CW, @ Output Connector**  
Nominal 2200 watts / Min. 2000 watts  
Linear @ 1dB Compression 500 watts min.

**Flatness**  
±11dB max., equalized for ±5dB max. at rated power

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 63dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 400 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.

**Noise Power Density**  
Minus 70dBm/Hz max., Minus 72dBm/Hz typ.

**Harmonic Distortion**  
Minus 20dBc max., Minus 27dBc typ.

**Primary Power**  
190 - 255 VAC  
50/60 Hz, three phase, delta (4 wire)  
22 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type WRD-750D24 waveguide flange on rear panel  
RF output sample ports (forward and reflected)  
Interlock Type N female on rear panel  
GPIO DB-15 female on rear panel  
GPIO IEEE-488 female on rear panel

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

**Weight** 1182 kg (2600 lb)

**Size (WxHxD) (4 cabinets)**  
56 x 160 x 82.3 cm / 22.1 x 63 x 32.4 in. per cabinet



40T18G26A TWT Amplifier

## 40 watts. 18-26.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
Nominal 45 watts / min. 40 watts  
Linear @ 1dB Compression 10 watts min.

**Flatness** ±8dB max.

**Frequency Response** 18 - 26.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 46dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 10 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.

**Noise Power Density**  
Minus 60dBm/Hz max., Minus 65dBm/Hz typ.

**Harmonic Distortion**  
Minus 20dBc max., Minus 28dBc typ.

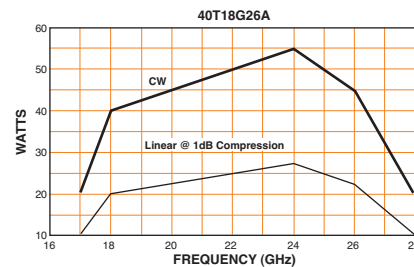
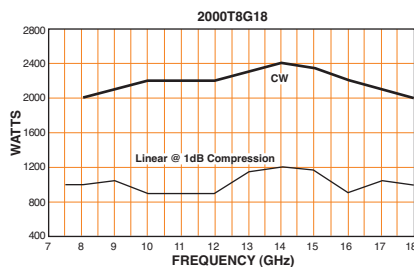
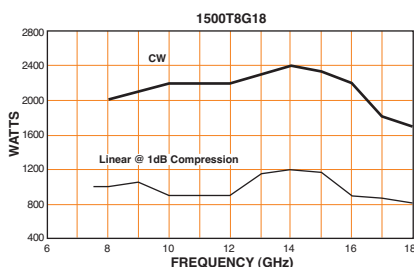
**Primary Power**  
99 - 260 VAC  
50/60 Hz, single phase  
850 VA max.

**Connectors**  
RF input Type K female on rear panel  
RF output Type WR-42 waveguide flange on rear panel  
RF output sample port Type K female on rear panel  
Interlock DB-15 female on rear panel  
GPIO IEEE-488 female on rear panel

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

**Weight** 30 kg (65 lb)

**Size (WxHxD)**  
50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



# 26.5 to 40 GHz

## 130T18G26z5B TWT Amplifier



### 130 watts. 18-26.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 150 watts / min. 130 watts  
 Linear @ 1dB Compression 30 watts min.

**Flatness** ±9dB max.

**Frequency Response** 18 - 26.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 52dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 20 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.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 75dBm/Hz typ.

**Harmonic Distortion**  
 Minus 15dBc max., Minus 20dBc typ.

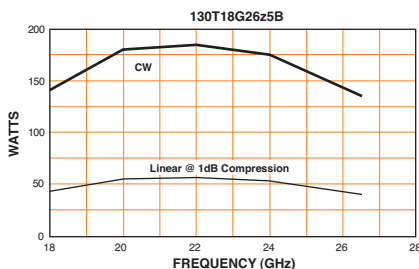
**Primary Power**  
 190 - 260 VAC  
 50/60 Hz, single phase  
 0.8 kVA max.

**Connectors**  
 RF input Type K female on rear panel  
 RF output Type WR-42 waveguide flange on rear panel  
 RF output sample port Type K female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 on rear panel  
 Video BNC female on rear panel

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

**Weight** 36 kg (80 lb)

**Size (WxHxD)**  
 50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



## 200T18G26z5A TWT Amplifier



### 200 watts. 18-26.5 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 225 watts / min. 200 watts  
 Linear @ 1dB Compression 50 watts min.

**Flatness** ±10dB max.

**Frequency Response** 18 - 26.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 53dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 40 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.

**Video Pulse Capability**  
 Pulse Width 0.1 microseconds min.  
 Pulse Rate (PRF) 10 kHz max.  
 Duty Cycle  
 Some restrictions apply. Contact AR with application requirements.

**RF Rise and Fall** 100 ns max. (10% to 90%)

**Delay** 500 ns max from pulse input to RF90%

**Pulse Width Distortion**  
 200 ns max (50% points of output pulse width compared to 50% points of input pulse width)

**Noise Power Density (pulse off)** Minus 140 dBm/Hz typ.

**Pulse Off Isolation** 80 dB min., 90 dB typ.

**Pulse Input**  
 TTL Level, 50 Ohm nominal termination, high level enables RF when video pulsing mode is selected.

**Noise Power Density**  
 Minus 70dBm/Hz max., Minus 75dBm/Hz typ.

**Harmonic Distortion**  
 Minus 20dBc max., Minus 30dBc typ.

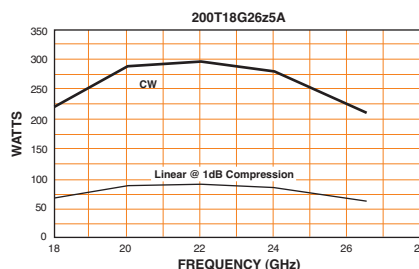
**Primary Power**  
 190 - 260 VAC  
 50/60 Hz, single phase  
 3 kVA max.

**Connectors**  
 RF input Type K female on rear panel  
 RF output Type WR-42 waveguide flange on rear panel  
 RF output sample port Type K female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 on rear panel

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

**Weight** 91 kg (200 lb)

**Size (WxHxD)**  
 50.3 x 43 x 81 cm / 19.8 x 17 x 32 in.



## 40T26G40A TWT Amplifier



### 40 watts. 26.5-40 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 45 watts / min. 40 watts  
 Linear @ 1dB Compression 10 watts min.

**Flatness** ±8dB max.

**Frequency Response** 26.5 - 40 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 46dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output power foldback protection at reflected power exceeding 10 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.

**Noise Power Density**  
 Minus 60dBm/Hz max., Minus 70dBm/Hz typ.

**Harmonic Distortion**  
 Minus 20dBc max., Minus 28dBc typ.

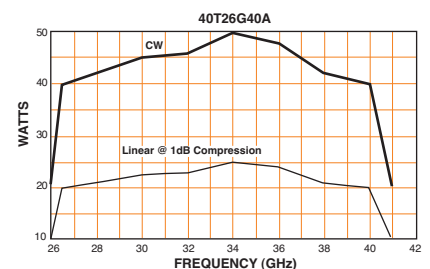
**Primary Power**  
 99 - 260 VAC  
 50/60 Hz, single phase  
 850 VA max.

**Connectors**  
 RF input Type K female on rear panel  
 RF output Type WR-28 waveguide flange on rear panel  
 RF output sample port Type K female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 on rear panel

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

**Weight** 30 kg (65 lb)

**Size (WxHxD)**  
 50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



# Microwave Amplifiers 26.5 to 40 GHz

# 40 to 45 GHz

130T26z5G40B TWT Amplifier



## 130 watts. 26.5-40 GHz CW

**Power (fundamental), CW, @ Output Connector**  
Nominal 150 watts / min. 130 watts  
Linear @ 1dB Compression 30 watts min.

**Flatness** ±10dB max.

**Frequency Response** 26.5 - 40 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 52dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 20 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.

**Noise Power Density**  
Minus 70dBm/Hz max., Minus 75dBm/Hz typ.

**Harmonic Distortion**  
Minus 15dBc max., Minus 20dBc typ.

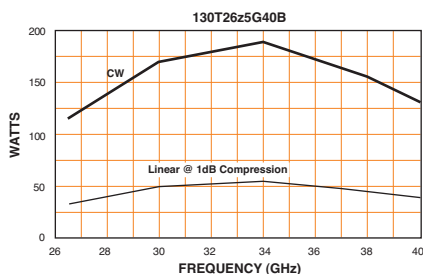
**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
0.8 kVA max.

**Connectors**  
RF input Type K female on rear panel  
RF output Type WR-28 waveguide flange on rear panel  
RF output sample port Type K female on rear panel  
Interlock DB-15 female on rear panel  
 GPIB IEEE-488 on rear panel

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

**Weight** 36 kg (80 lb)

**Size (WxHxD)**  
50.3 x 16.5 x 68.6 cm / 19.8 x 6.5 x 27 in.



200T26z5G40A TWT Amplifier



## 200 watts. 26.5-40 GHz CW

**Power (fundamental), CW, @ Output Connector**  
Nominal 225 watts / min. 200 watts  
Linear @ 1dB Compression 50 watts min.

**Flatness** ±10dB max.

**Frequency Response** 26.5 - 40 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 53dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output power foldback protection at reflected power exceeding 40 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.

**Video Pulse Capability**  
Pulse Width 0.1 microseconds min.  
Pulse Rate (PRF) 10 kHz max.  
Duty Cycle  
Some restrictions apply. Contact AR with application requirements.

**RF Rise and Fall** 100 ns max. (10% to 90%)

**Delay** 500 ns max from pulse input to RF90%

**Pulse Width Distortion**  
200 ns max (50% points of output pulse width compared to 50% points of input pulse width)

**Noise Power Density (pulse off)** Minus 140 dBm/Hz typ.

**Pulse Off Isolation** 80 dB min., 90 dB typ.

**Pulse Input**  
TTL Level, 50 Ohm nominal termination, high level enables RF when video pulsing mode is selected.

**Noise Power Density**  
Minus 70dBm/Hz max., Minus 75dBm/Hz typ.

**Harmonic Distortion**  
Minus 20dBc max., Minus 30dBc typ.

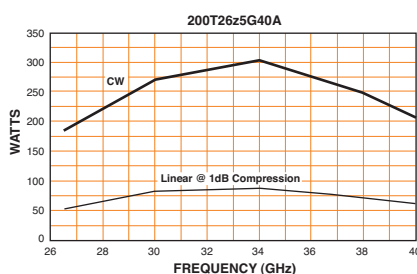
**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
3 kVA max.

**Connectors**  
RF input Type K female on rear panel  
RF output Type WR-42 waveguide flange on rear panel  
RF output sample port Type K female on rear panel  
Interlock DB-15 female on rear panel  
 GPIB IEEE-488 on rear panel

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

**Weight** 91 kg (200 lb)

**Size (WxHxD)**  
50.3 x 43 x 81 cm / 19.8 x 17 x 32 in.



70T40G45 TWT Amplifier



## 70 watts. 40-45 GHz CW

**Power (fundamental), CW, @ Output Connector**  
Nominal 85 watts / min. 70 watts  
Linear @ 1dB Compression 17 watts min.

**Flatness** ±5dB max.

**Frequency Response** 40 - 45 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 48dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output isolator used to offer excellent mismatch tolerance up to reflected power of 70 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.

**Noise Power Density**  
Minus 70dBm/Hz max., Minus 75dBm/Hz typ.

**Harmonic Distortion**  
Minus 20dBc typ.

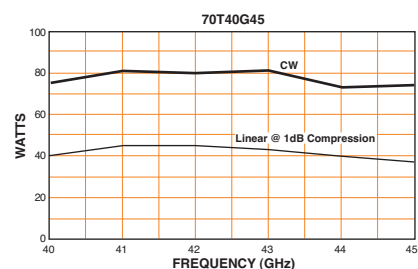
**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
1 kVA max.

**Connectors**  
RF input Type 2.4 mm female on rear panel  
RF output Type WR-22 waveguide flange on rear panel  
RF output sample ports Type 2.4 mm female on rear panel  
Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 41 kg (120 lb)

**Size (WxHxD)**  
50.3 x 25.4 x 68.6 cm / 19.8 x 10 x 27 in.



# 1 to 2 GHz Pulse      1 to 2.5 GHz Pulse

## 120T40G45 TWT Amplifier



### 120 watts. 40-45 GHz CW

**Power (fundamental), CW, @ Output Connector**  
 Nominal 140 watts / min. 120 watts  
 Linear @ 1dB Compression 30 watts min.

**Flatness** ±5dB max.

**Frequency Response** 40 - 45 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 51dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.0:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

#### Mismatch Tolerance

Output isolator used to offer excellent mismatch tolerance up to reflected power of 120 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.

#### Noise Power Density

Minus 70dBm/Hz max., Minus 75dBm/Hz typ.

#### Harmonic Distortion

Minus 20dBc typ.

#### Primary Power

190 - 260 VAC  
 50/60 Hz, single phase  
 2 kVA max.

#### Connectors

RF input Type 2.4 mm female on rear panel  
 RF output Type WR-22 waveguide flange on rear panel  
 RF output sample ports Type 2.4 mm female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

#### Cooling

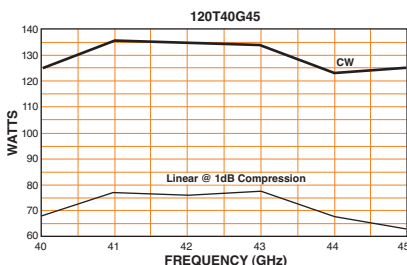
Forced air (self contained fans), air entry and exit in rear.

#### Weight

105 kg (230 lb)

#### Size (WxHxD)

50.3 x 43 x 76 cm / 19.8 x 17 x 30 in.



## 3800TP1G2 Pulse TWT Amplifier



### 3800 watts. 1-2 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output**  
 Nominal 4500 watts / min. 3800 watts

**Flatness** ±6dB min.

**Frequency Response** 1 - 2 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 66dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**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 max.  
 Duty Cycle 4% max.  
 RF Rise and Fall 30 ns max. (10% - 90%)  
 Delay 300 ns max. from pulse input to RF 90%  
 Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)

Pulse Off Isolation 80 dB min., 90 dB typ.

Pulse Input TTL level, 50 ohm nominal termination

#### Noise Power Density

(pulse on) Minus 60dBm/Hz max., Minus 65dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

#### Harmonic Distortion

Minus 3dBc max. / Minus 5dBm typ.

#### Primary Power

190 - 260 VAC  
 50/60 Hz, single phase  
 2 kVA max.

#### Connectors

RF input Type N female on rear panel  
 RF output Type DIN 7-16 female on rear panel  
 RF output forward and reflected sample ports Type N female on rear panel  
 Pulse input Type BNC female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

#### Cooling

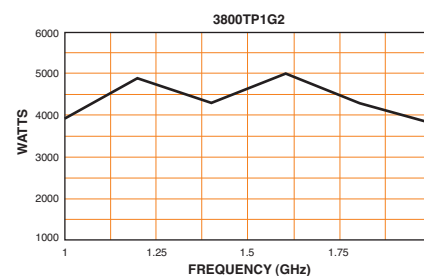
Forced air (self contained fans), air entry and exit in rear.

#### Weight

57 kg (125 lb)

#### Size (WxHxD)

50.3 x 26 x 94 cm / 19.8 x 10.3 x 37 in.



## 1000TP1G2z5 Pulse TWT Amplifier



### 1000 watts. 1-2.5 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output Connector**  
 Nominal 1700 watts / min. 1000 watts

**Flatness** ±6dB max.

**Frequency Response** 1 - 2.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**

Output pulse width foldback protection at average reflected power exceeding 700 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 max.  
 Duty Cycle 4% max.  
 RF Rise and Fall 30 ns max. (10% to 90%)  
 Delay 300 ns max. from pulse input to RF 90%  
 Pulse Width Distortion ±30 ns max (50% points of output pulse width compared to 50% points of input pulse width)

Pulse Off Isolation 80dB min. / 90dB typ.

#### Noise Power Density

(pulse on) Minus 70dBm/Hz max., Minus 80dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

#### Harmonic Distortion

Minus 3dBc max., Minus 6dBc typ.

#### Primary Power

190 - 260 VAC  
 50/60 Hz, single phase  
 1.2 kVA max.

#### Connectors

RF input Type N female on rear panel  
 RF output Type DIN 7-16 female on rear panel  
 RF output sample port Type N female on rear panel  
 Pulse input Type BNC female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

#### Cooling

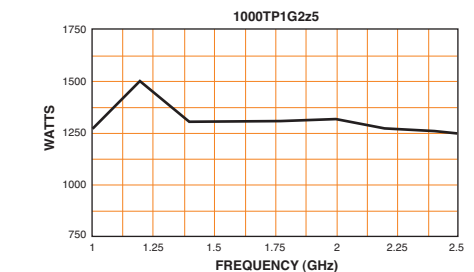
Forced air (self contained fans), air entry and exit in rear.

#### Weight

57 kg (125 lb)

#### Size (WxHxD)

50.3 x 26 x 94 cm. / 19.8 x 10.3 x 37 in.



# Microwave Amplifiers

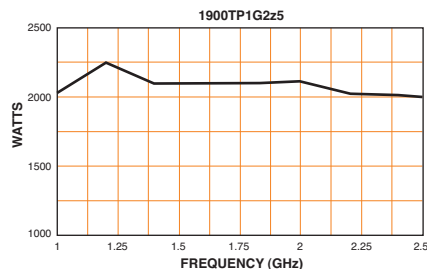
## 1 to 2.5 GHz Pulse

### 1900TP1G2z5 Pulse TWT Amplifier



#### 1900 watts. 1-2.5 GHz Pulse

<b>Power (fundamental), Peak Pulse, @ Output Connector</b>	Nominal 2400 watts / min. 1900 watts
<b>Flatness</b>	±6dB max.
<b>Frequency Response</b>	1 - 2.5 GHz instantaneously
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	63dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.5:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.
<b>Mismatch Tolerance</b>	Output pulse width foldback protection at average reflected power exceeding 1000 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.
<b>Pulse Capability</b>	
Pulse Width	0.07 - 100 microseconds
Pulse Rate (PRF)	100 kHz max.
Duty Cycle	4% max.
RF Rise and Fall	30 ns max (10% to 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse Width Distortion	±30 ns max (50% points of output pulse width compared to 50% points of input pulse width)
Pulse Off Isolation	80dB min. / 90dB typ.
Pulse Input	TTL level, 50 ohm nominal termination
<b>Noise Power Density</b>	(pulse on) Minus 70dBm/Hz max., Minus 80dBm/Hz typ. (pulse off) Minus 140dBm/Hz typ.
<b>Harmonic Distortion</b>	Minus 3dBc max., Minus 6dBc typ.
<b>Primary Power</b>	190 - 260 VAC 50/60 Hz, single phase 1.2 kVA max.
<b>Connectors</b>	RF input Type N female on rear panel RF output Type DIN 7-16 female on rear panel RF output sample port Type N female on rear panel Pulse input Type BNC female on rear panel Interlock DB-15 female on rear panel GPIB IEEE-488 female on rear panel
<b>Cooling</b>	Forced air (self contained fans), air entry and exit in rear.
<b>Weight</b>	57 kg (125 lb)
<b>Size (WxHxD)</b>	56 x 26 x 94 cm / 22.1 x 10.3 x 37 in.

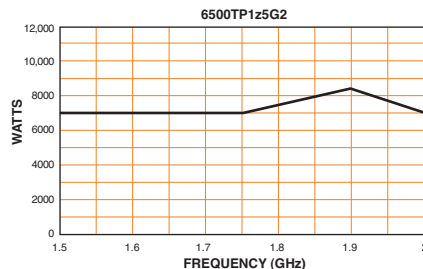


### 6500TP1z5G2 Pulse TWT Amplifier



#### 6500 watts. 1.5-2 GHz Pulse

<b>Power (fundamental), Peak Pulse, @ Output</b>	Nominal 8000 watts / min. 6500 watts
<b>Flatness</b>	±6dB min.
<b>Frequency Response</b>	1.5 - 2 GHz
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	68dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.5:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.
<b>Mismatch Tolerance</b>	Output VSWR protection using internal isolator. 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.
<b>Pulse Capability</b>	
Pulse Width	0.07 - 40 microseconds
Pulse Rate (PRF)	100 kHz max.
Duty Cycle	1% max.
RF Rise and Fall	30 ns max. (10% - 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse Width Distortion	±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)
Pulse Off Isolation	80 dB min., 90 dB typ.
Pulse Input	TTL level, 50 ohm nominal termination
<b>Noise Power Density</b>	(pulse on) Minus 55dBm/Hz max., Minus 65dBm/Hz typ. (pulse off) Minus 140dBm/Hz typ.
<b>Harmonic Distortion</b>	Minus 15dBc max.
<b>Primary Power</b>	190 - 260 VAC 50/60 Hz, single phase 1 kVA max.
<b>Connectors</b>	RF input Type N female on rear panel RF output Type DIN 7-16 on rear panel RF output forward and reflected sample ports Type N female on rear panel Pulse input Type BNC female on rear panel Interlock DB-15 female on rear panel GPIB IEEE-488 female on rear panel
<b>Cooling</b>	Forced air (self contained fans), air entry and exit in rear.
<b>Weight</b>	57 kg (125 lb)
<b>Size (WxHxD)</b>	50.3 x 26 x 94 cm / 19.8 x 10.3 x 37 in.

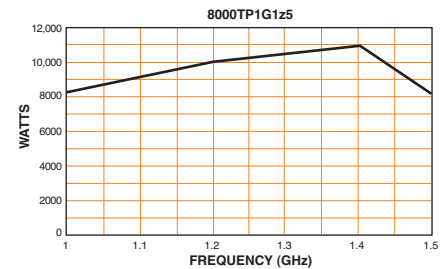


### 8000TP1G1z5 Pulse TWT Amplifier



#### 8000 watts. 1-1.5 GHz Pulse

<b>Power (fundamental), Peak Pulse, @ Output</b>	Nominal 10,000 watts / min. 8000 watts
<b>Flatness</b>	±6dB min.
<b>Frequency Response</b>	1 - 1.5 GHz
<b>Input For Rated Output</b>	1 milliwatt max.
<b>Gain (at max. setting)</b>	69dB min.
<b>Gain Adjustment (continuous range)</b>	35dB min.
<b>Input Impedance</b>	50 ohms, VSWR 2.5:1 max.
<b>Output Impedance</b>	50 ohms, VSWR 2.5:1 typ.
<b>Mismatch Tolerance</b>	Output VSWR protection using internal isolator. 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.
<b>Pulse Capability</b>	
Pulse Width	0.07 - 40 microseconds
Pulse Rate (PRF)	100 kHz max.
Duty Cycle	1% max.
RF Rise and Fall	30 ns max. (10% - 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse Width Distortion	±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)
Pulse Off Isolation	80 dB min., 90 dB typ.
Pulse Input	TTL level, 50 ohm nominal termination
<b>Noise Power Density</b>	(pulse on) Minus 55dBm/Hz max., Minus 65dBm/Hz typ. (pulse off) Minus 140dBm/Hz typ.
<b>Harmonic Distortion</b>	Minus 15dBc max.
<b>Primary Power</b>	190 - 260 VAC 50/60 Hz, single phase 1 kVA max.
<b>Connectors</b>	RF input Type N female on rear panel RF output Type DIN 7-16 on rear panel RF output forward and reflected sample ports Type N female on rear panel Pulse input Type BNC female on rear panel Interlock DB-15 female on rear panel GPIB IEEE-488 female on rear panel
<b>Cooling</b>	Forced air (self contained fans), air entry and exit in rear.
<b>Weight</b>	57 kg (125 lb)
<b>Size (WxHxD)</b>	50.3 x 26 x 94 cm / 19.8 x 10.3 x 37 in.





**4000 watts. 2-4 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 5800 watts / min. 4.7 kW

**Flatness** ±10dB min.

**Frequency Response** 2 - 4 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 66dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**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 max.  
Duty Cycle 4% max.  
RF Rise and Fall 30 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%  
Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
Pulse Off Isolation 80 dB min., 90 dB typ.  
Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 57dBm/Hz max., Minus 59dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 0dBc max.

**Primary Power** 208 VAC ± 10%  
Three phase, 50/60 Hz  
3 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type N female on rear panel  
RF output forward sample port Type N female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 75 kg (165 lb)

**Size (WxHxD)** 48.3 x 30.5 x 84 cm / 19 x 12 x 33 in.



**6900 watts. 2-4 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 9000 watts / min. 6900 watts

**Flatness** ±8dB min., ±4dB at rated power

**Frequency Response** 2 - 4 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 68dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 4000 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 0.2 - 50 microseconds  
Pulse Rate (PRF) 100 kHz max.  
Duty Cycle 4% max.  
RF Rise and Fall 35 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%  
Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
Pulse Off Isolation 80 dB min., 90 dB typ.  
Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 55dBm/Hz max., Minus 84dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 15dBc max.

**Primary Power** 208 VAC ± 10%  
50/60 Hz, three phase, delta (4 wire)  
5 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type DIN 7-16 female on rear panel  
RF output forward and reflected sample ports Type N female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 121 kg (265 lb)

**Size (WxHxD)** 50 x 43 x 84 cm / 19.8 x 17 x 33 in.



**1000 Watt. 2.5-7.5 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output Connector**  
Nominal 1800 watts / min. 1000 watts

**Flatness** ±7dB max., equalized for ±3dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 500 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 max.  
Duty Cycle 4% max.  
RF Rise and Fall 30 ns max (10% to 90%)  
Delay 300 ns max. from pulse input to RF 90%  
Pulse Width Distortion ±30 ns max (50% points of output pulse width compared to 50% points of input pulse width)  
Pulse Off Isolation 80dB min., 90dB typ.  
Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 72dBm/Hz max., Minus 74dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 0dBc max., Minus 1.5dBc typ.

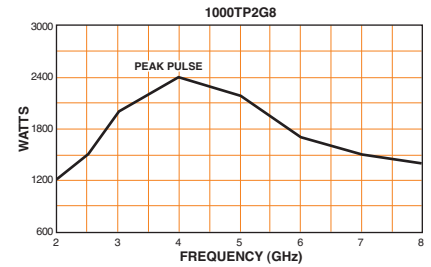
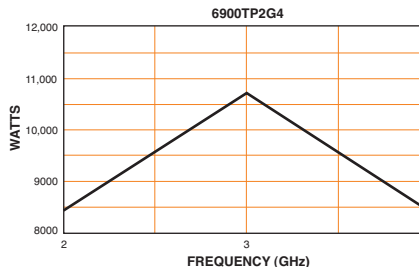
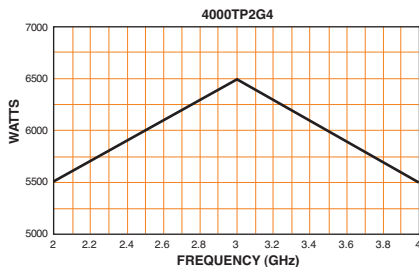
**Primary Power** 190 - 260 VAC  
Single phase, 50/60 Hz  
1.5 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type N female on rear panel  
RF output sample port Type N female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 52 kg (115 lb)

**Size (WxHxD)** 50.3 x 25.4 x 69 cm / 19.8 x 10 x 27 in



# Microwave Amplifiers

## 2.5 to 7.5 GHz Pulse 4 to 8 GHz Pulse

2000TP2G8B Pulse TWT Amplifier



### 2000 watts. 2.5 - 7.5 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output Connector**  
 Nominal 2200 watts / min. 1000 watts

**Flatness** ±13dB max., equalized for ±3dB max. at rated power

**Frequency Response** 2.5 - 7.5 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 63dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output pulse width foldback protection at peak reflected power exceeding 1000 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 - 30 microseconds  
 Pulse Rate (PRF) 100 kHz max.  
 Duty Cycle 4% max.  
 RF Rise and Fall 30 ns max. (10% to 90%)  
 Delay 300 ns max. from pulse input to RF 90%  
 Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
 Pulse Off Isolation 80dB min., 90dB typ.  
 Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
 (pulse on) Minus 70dBm/Hz max., Minus 72dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 0dBc max., Minus 1.5dBc typ.

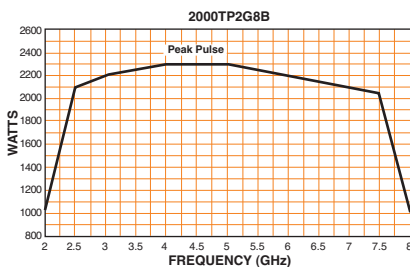
**Primary Power**  
 190 - 260 VAC  
 Single phase, 50/60 Hz  
 1.2 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type N female on rear panel  
 RF output sample port Type N female on rear panel  
 Pulse input Type BNC female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 53 kg (115 lb)

**Size (WxHxD)** 50.3 x 25.4 x 82 cm / 19.8 x 10 x 32 in.



4000TP4G8 Pulse TWT Amplifier



### 4000 watts. 4-8 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output**  
 Nominal 5000 watts / min. 3.8 kW from 4 - 4.5 GHz,  
 4 kW from 4.5 - 7.5 GHz, 3.8 kW from 7.5 - 8 GHz

**Flatness** ±10dB min.

**Frequency Response** 4 - 8 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 66dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**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 max.  
 Duty Cycle 4% max.  
 RF Rise and Fall 30 ns max. (10% - 90%)  
 Delay 300 ns max. from pulse input to RF 90%  
 Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
 Pulse Off Isolation 80 dB min., 90 dB typ.  
 Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
 (pulse on) Minus 65dBm/Hz max., Minus 75dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 0dBc max.

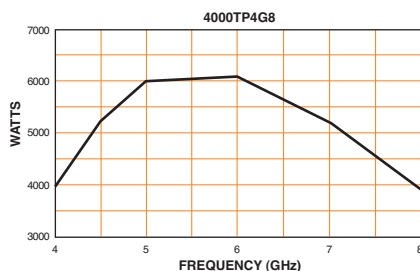
**Primary Power**  
 208 VAC ± 10%  
 50/60 Hz, three phase  
 2.5 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type WRD-350 waveguide flange on rear panel  
 RF output forward sample port Type N female on rear panel  
 Pulse input Type BNC female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 71 kg (155 lb)

**Size (WxHxD)** 51 x 44.5 x 84 cm / 19.8 x 17.5 x 33 in.



7400TP4G8 Pulse TWT Amplifier



### 7400 watts. 4-8 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output**  
 Nominal 10,000 watts / min. 7400 watts

**Flatness** ±10dB min., ±5dB at rated power

**Frequency Response** 4 - 8 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 69dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
 Output pulse width foldback protection at peak reflected power exceeding 4000 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 0.2 - 50 microseconds  
 Pulse Rate (PRF) 100 kHz max.  
 Duty Cycle 4% max.  
 RF Rise and Fall 30 ns max. (10% - 90%)  
 Delay 300 ns max. from pulse input to RF 90%  
 Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
 Pulse Off Isolation 80 dB min., 90 dB typ.  
 Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
 (pulse on) Minus 65dBm/Hz max., Minus 85dBm/Hz typ.  
 (pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 15dBc typ.

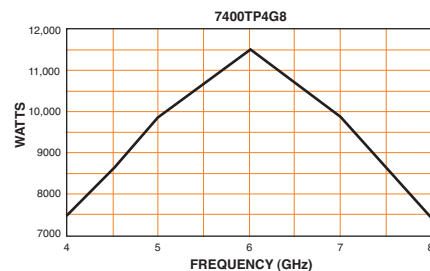
**Primary Power**  
 208 VAC ± 10%  
 50/60 Hz, three phase, delta (4 wire)  
 5 kVA max.

**Connectors**  
 RF input Type N female on rear panel  
 RF output Type WRD-350 waveguide flange on rear panel  
 RF output forward and reflected sample ports Type N female on rear panel  
 Pulse input Type BNC female on rear panel  
 Interlock DB-15 female on rear panel  
 GPIB IEEE-488 female on rear panel

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

**Weight** 123 kg (270 lb)

**Size (WxHxD)** 50.3 x 53 x 91 cm / 19.8 x 24 x 36 in.



# 7.5 to 18 GHz Pulse

# 8 to 10 GHz Pulse 51



**1000 watts. 7.5-18 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output Connector**  
Nominal 1800 watts / min. 1000 watts

**Flatness** ±8dB max., equalized for ±3dB max. at rated power

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 60dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at average reflected power exceeding 500 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 max.
Duty Cycle	4% max.
RF Rise and Fall	30 ns max (10% to 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse Width Distortion	±30ns max (50% points of output pulse width compared to 50% points of input pulse width)
Pulse Off Isolation	80dB min. / 90dB typ.

**Noise Power Density**  
(pulse on) Minus 57dBm/Hz max., Minus 58dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 2dBc max., Minus 3dBc typ.

**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
1.5 kVA max.

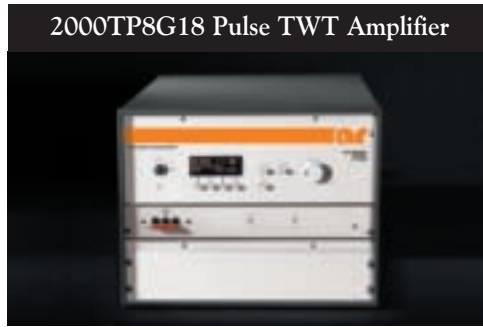
**Connectors**

RF input	Type N female on rear panel
RF output	Type WRD-750D24 waveguide flange on rear panel
RF output sample port	Type N female on rear panel
Pulse input	Type BNC female on rear panel
Interlock	DB-15 female on rear panel
GPIB	IEEE-488 female on rear panel

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

**Weight** 52 kg (115 lb)

**Size (WxHxD)**  
50.3 x 25.4 x 69 cm / 19.8 x 10 x 27 in.



**2000 watts. 7.5-18 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output Connector**  
Nominal 2500 watts / min. 2000 watts

**Flatness** ±8dB max., equalized for ±3dB max. at rated power

**Frequency Response** 7.5 - 18 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 63dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at average reflected power exceeding 1000 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 - 30 microseconds
Pulse Rate (PRF)	100 kHz max.
Duty Cycle	4% max.
RF Rise and Fall	30 ns max (10% to 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse Width Distortion	±30ns max (50% points of output pulse width compared to 50% points of input pulse width)
Pulse Off Isolation	80dB min. / 90dB typ.

**Noise Power Density**  
(pulse on) Minus 55dBm/Hz max., Minus 58dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 18dBc max., Minus 20dBc typ.

**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
3 kVA max.

**Connectors**

RF input	Type N female on rear panel
RF output	Type WRD-750D24 waveguide flange on rear panel
RF output sample port	Type N female on rear panel
Pulse input	Type BNC female on rear panel
Interlock	DB-15 female on rear panel
GPIB	IEEE-488 female on rear panel

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

**Weight** 72 kg (170 lb)

**Size (WxHxD)**  
50.3 x 39.4 x 77.5 cm / 19.8 x 15.5 x 30.5 in.



**10,000 watts. 8-10 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 11,000 watts / min. 10,000 watts

**Flatness** ±6dB max.

**Frequency Response** 8 - 10 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 70dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 5000 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 - 40 microseconds
Pulse Rate (PRF)	100 kHz max.
Duty Cycle	4% max.
RF Rise and Fall	30 ns max. (10% - 90%)
Delay	300 ns max. from pulse input to RF 90%
Pulse width distortion	±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)
Pulse Off Isolation	80 dB minimum, 90 dB typ.
Pulse Input	TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 65dBm/Hz max., Minus 69dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 15dBc max.

**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
2.5 kVA max.

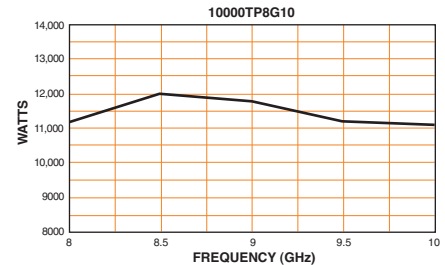
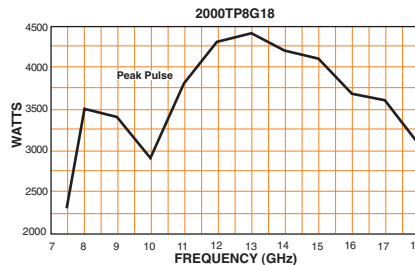
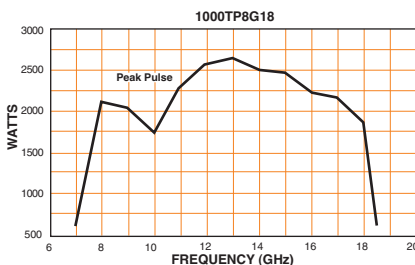
**Connectors**

RF input	Type N female on rear panel
RF output	Type WR-90 waveguide flange on rear panel
RF output forward and reflected sample ports	Type N female on rear panel
Pulse input	Type BNC female on rear panel
Interlock	DB-15 female on rear panel
GPIB	IEEE-488 female on rear panel

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

**Weight** 107 kg (235 lb)

**Size (WxHxD)**  
50.3 x 49 x 74 cm / 19.8 x 19 x 29 in.



# Microwave Amplifiers

## 8 to 12 GHz Pulse

2000TP8G12 Pulse TWT Amplifier



### 2000 watts. 8.2-12.4 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output Connector**  
Nominal 2500 watts / min. 2000 watts

**Flatness** ±13dB max., equalized for ±3dB max. at rated power

**Frequency Response** 8.2 - 12.4 GHz instantaneously

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 63dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at average reflected power exceeding 1000 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 - 30 microseconds  
Pulse Rate (PRF) 100 kHz max.  
Duty Cycle 4% max.  
RF Rise and Fall 30 ns max (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%

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

**Pulse Off Isolation** 80dB min. / 90dB typ.

**Noise Power Density**  
(pulse on) Minus 70dBm/Hz max. / Minus 75dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 8dBc max., Minus 10dBc typ.

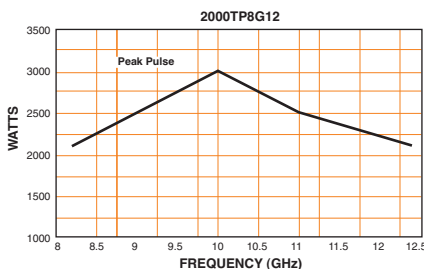
**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
2.0 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type WRD-750D24 waveguide flange on rear panel  
RF output sample port Type N female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 68 kg (150 lb)

**Size (WxHxD)**  
50.3 x 31.1 x 77.5 cm / 19.8 x 12.25 x 30.5 in.



4000TP8G12 Pulse TWT Amplifier



### 4000 watts. 8-12 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 5500 watts / min. 4200 watts

**Flatness** ±10dB min.

**Frequency Response** 8 - 12 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 66dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**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 max.  
Duty Cycle 4% max.  
RF Rise and Fall 30 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%

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

**Pulse Off Isolation** 80 dB min., 90 dB typ.

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

**Noise Power Density**  
(pulse on) Minus 57dBm/Hz max., Minus 59dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 10dBc max.

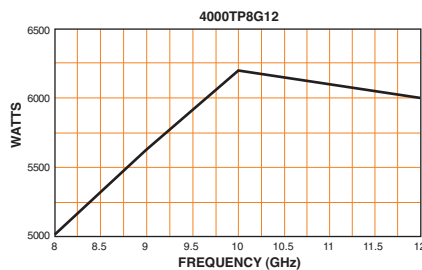
**Primary Power**  
208 VAC ± 10% or 190 - 260 VAC  
50/60 Hz, three phase or single phase  
3 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type WRD-90 waveguide flange on rear panel  
RF output forward sample port Type N female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 75 kg (165 lb)

**Size (WxHxD)** 51 x 44.5 x 69 cm / 19.8 x 17.5 x 27 in.



8300TP8G12 Pulse TWT Amplifier



### 8300 watts. 8-12 GHz Pulse

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 10,000 watts / min. 8300 watts

**Flatness** ±10dB max., ±5dB at rated power

**Frequency Response** 8 - 12 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 69dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 4000 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 0.2 - 50 microseconds  
Pulse Rate (PRF) 100 kHz max.  
Duty Cycle 4% max.  
RF Rise and Fall 35 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%

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

**Pulse Off Isolation** 80 dB min., 90 dB typ.

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

**Noise Power Density**  
(pulse on) Minus 70dBm/Hz max., Minus 73dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 15dBc max.

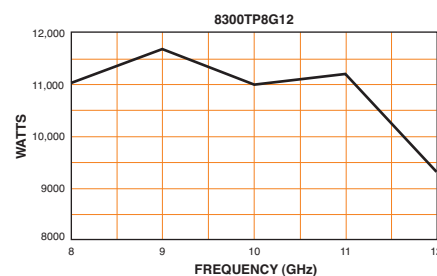
**Primary Power**  
208 VAC ± 10%  
50/60 Hz, three phase, delta (4 wire)  
5 kVA max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type WR-90 waveguide flange on rear panel  
RF output forward and reflected sample ports Type N precision female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 121 kg (265 lb)

**Size (WxHxD)** 50.3 x 43 x 84 cm / 19.8 x 17 x 33 in.



# 10 to 12 GHz Pulse 12 to 18 GHz Pulse



**8000 watts. 10-12 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 10,000 watts / min. 8100 watts

**Flatness** ±6dB min.

**Frequency Response** 10 - 12 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 69dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 4000 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 - 40 microseconds  
Pulse Rate (PRF) 100 kHz max.  
Duty Cycle 4% max.  
RF Rise and Fall 30 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%  
Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
Pulse Off Isolation 80 dB min., 90 dB typ.  
Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 65dBm/Hz max., Minus 69dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 15dBc max.

**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
2.5 kVA max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type WR-90 waveguide flange on rear panel  
RF output forward and reflected sample ports Type N precision female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 107 kg (235 lb)

**Size (WxHxD)**  
50.3 x 49 x 74 cm / 19.8 x 19 x 29 in.



**3000 watts. 12-18 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 3800 watts / min. 3000 watts

**Flatness** ±10dB max.

**Frequency Response** 12 - 18 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 65dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 1500 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 - 50 microseconds  
Pulse Rate (PRF) 100 kHz max.  
Duty Cycle 4% max.  
RF Rise and Fall 30 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%  
Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
Pulse Off Isolation 80 dB min., 90 dB typ.  
Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 55dBm/Hz max., Minus 65dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 8dBc max.

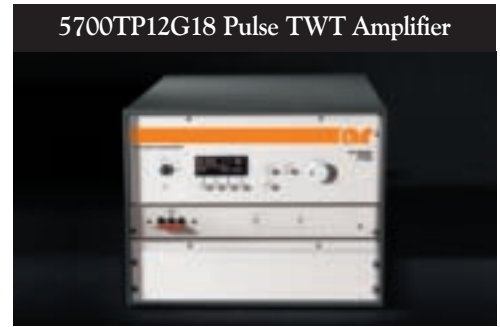
**Primary Power**  
190 - 260 VAC  
50/60 Hz, single phase  
2 kVA max.

**Connectors**  
RF input Type N female on rear panel  
RF output Type WR-62 waveguide flange on rear panel  
RF output forward sample port Type N female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 52 kg (115 lb)

**Size (WxHxD)**  
50.3 x 26 x 69 cm / 19.8 x 10 x 27 in.



**5700 watts. 12-18 GHz Pulse**

**Power (fundamental), Peak Pulse, @ Output**  
Nominal 7000 watts / min. 5700 watts

**Flatness** ±10dB min., ±5dB at rated power

**Frequency Response** 12 - 18 GHz

**Input For Rated Output** 1 milliwatt max.

**Gain (at max. setting)** 67dB min.

**Gain Adjustment (continuous range)** 35dB min.

**Input Impedance** 50 ohms, VSWR 2.5:1 max.

**Output Impedance** 50 ohms, VSWR 2.5:1 typ.

**Mismatch Tolerance**  
Output pulse width foldback protection at peak reflected power exceeding 3000 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 0.2 - 50 microseconds  
Pulse Rate (PRF) 100 kHz max.  
Duty Cycle 4% max.  
RF Rise and Fall 35 ns max. (10% - 90%)  
Delay 300 ns max. from pulse input to RF 90%  
Pulse Width Distortion ±30 ns max. (50% points of output pulse width compared to 50% points of input pulse width)  
Pulse Off Isolation 80 dB min., 90 dB typ.  
Pulse Input TTL level, 50 ohm nominal termination

**Noise Power Density**  
(pulse on) Minus 55dBm/Hz max., Minus 80dBm/Hz typ.  
(pulse off) Minus 140dBm/Hz typ.

**Harmonic Distortion** Minus 15dBc max.

**Primary Power**  
208 ±10% VAC  
50/60 Hz, three phase, delta (4 wire)  
5 kVA max.

**Connectors**  
RF input Type N precision female on rear panel  
RF output Type WR-62 waveguide flange on rear panel  
RF output forward and reflected sample ports Type N precision female on rear panel  
Pulse input Type BNC female on rear panel  
Interlock DB-15 female on rear panel  
GPIB IEEE-488 female on rear panel

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

**Weight** 121 kg (265 lb)

**Size (WxHxD)**  
50.3 x 43 x 84 cm / 19.8 x 17 x 33 in.

