

RF Solid State Amplifiers: The Most Innovative, Most Reliable, Highest Power RF Solid State Amplifiers Ever Created

All The Power You Need... With Legendary Performance & Reliability

"A" Series: Up to 400 MHz / 25 to 50,000 watts CW depending upon frequency range

"W" Series: Up to 1,000 MHz / 1 to 10,000 watts CW

Our "A" and "W" Series amplifiers have the power to deliver all the field strength you need. With unsurpassed mismatch capabilities and excellent flatness, they provide all the power promised over the entire operating band.

We subject our amplifiers to the harshest conditions just to make sure they give you reliable service and performance over the long haul. We test them under various output VSWR loads to stress them to the limit. The only problem we ran into was that there were no available loads to handle the enormous power, up to 80,000 watts, that our amplifiers deliver. Whereas this would stop most manufacturers, it presented another challenge to our talented designers, and we designed our own as shown in Figures 1 & 2. All our RF solid-state amplifiers have modulation capability that will faithfully reproduce AM, FM or Pulse Modulation appearing on the input signal for use in the most demanding EMC applications.

These technologically advanced amplifiers perform beyond the norm, beyond expectations, and way beyond the abilities of other test amplifiers.

These self-contained, broadband, completely solid-state amplifiers are designed for applications requiring the ultimate in output power over a wide instantaneous bandwidth with high gain. Extensive control and status reporting capabilities are available both locally and remotely. Most models feature air-cooled designs while some higher power units feature liquid cooled designs. The touch-screen panels are intuitive, convenient, and easy to use.



Figure 1
Mismatch Load Standards
for 0.5 - 4.5 GHz



Figure 2 -
Mismatch Standards
for DC - 700 MHz

AR Ultra High Power Amplifier Capabilities

AR’s history of providing broadband, high power amplifiers has remained constant through the years. Applying the latest technology has enabled us to break new ground in very high power, solid state amplifier design.

Facility

We made an investment two years ago to create a Large Amplifier Integration and Test Area. Not only did this open up floor space to support the building of multiple systems but it brought added HVAC capabilities for the amplifiers and primary AC power to properly conduct factory testing. Engineers now have the freedom to create designs to accommodate multiple configurations and optimize performance. The area also supports customer factory acceptance testing as required.

Air vs. Liquid Cooling

Liquid cooling of the amplifier’s solid-state transistors has a number of advantages. First, it allows for precise temperature control of the devices. The number one factor determining the reliability of solid state devices is temperature. By carefully controlling the temperature, engineers can optimize the performance of the amplifier without sacrificing reliability.

Second, it reduces the size of the amplifier. Air-cooled amplifiers use large metal heat sinks over which air is forced to carry away heat. In a liquid-cooled amplifier, the transistors are mounted on cooling plates through which water flows. The plates are much smaller than heat sinks and because you don’t have to accommodate air flow they can be built closer together.

Third, it reduces the heat load on the amplifier room and its resulting HVAC requirements. Since most of the heat generated is carried away by the cooling liquid, room HVAC requirements are reduced.

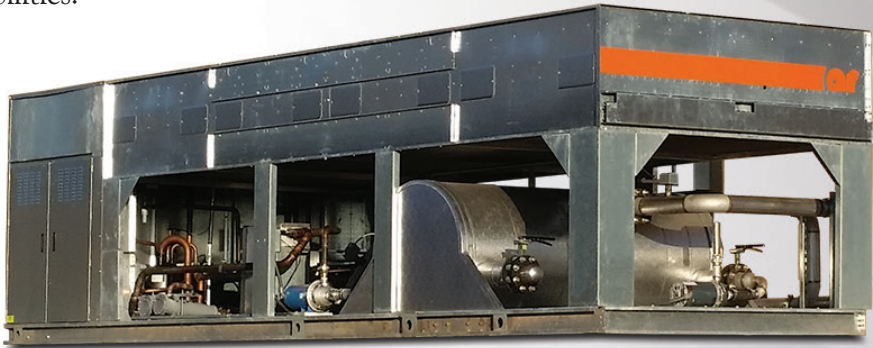
Fourth, it allows for fewer fans. This makes the amplifier audibly quieter. By reducing the noise, operators can work in a safer, more pleasant environment without fatigue.

Fifth, it gives customers the option of using existing cooling infrastructure to save costs. Liquid cooling options include an external chiller or the use of chilled water supplied by the customer’s facility. By utilizing existing infrastructure, operating costs can be reduced.

Visit <http://bit.ly/CoolAR> for more information on AR’s Liquid Cooling capabilities.

Informative Touch Panel

AR’s high power amplifiers incorporate our latest Touch Panel amplifier control system*. This new system makes it easier to monitor and control important amplifier functions. On the right are some example screen shots unique to one of AR’s newest ultra high power amplifiers. See page 73 for more details on AR’s intuitive touch panel capabilities.



RS-232/Fiber-Optic Serial Baud Rate T F

1200	19200
2400	38400
4800	57600
9600	115200

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Main Menu T F

100

RF Gain (%)

RF: On

Mode: CW

45800

Forward Power (W)

950

Reverse Power (W)

Select

Mode

User

RF On/Off

Breakout Firmware T F

Idr	Rev	Addr	Rev
1	1.70	23	1.70
2	1.70	24	1.70
3	1.70	25	1.70
4	1.70	26	1.70
5	1.70	27	1.70
6	1.70	28	1.70
7	1.70	29	1.70
8	1.70	30	1.70
9	1.70	31	1.70
10	1.70	32	1.70
11	1.70	33	1.70

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Sub-Systems T F

<div>1</div> <div><div>11750</div><div>Forward Power (W)</div></div> <div><div>235</div><div>Reverse Power (W)</div></div>	<div>2</div> <div><div>11900</div><div>Forward Power (W)</div></div> <div><div>215</div><div>Reverse Power (W)</div></div>
<div>3</div> <div><div>10200</div><div>Forward Power (W)</div></div> <div><div>210</div><div>Reverse Power (W)</div></div>	<div>4</div> <div><div>11950</div><div>Forward Power (W)</div></div> <div><div>290</div><div>Reverse Power (W)</div></div>

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* Touch Panel amplifier control system

“A” and “W” Series Amplifiers Provide A Wide Range Of Features & Benefits

- Highest Output Power In Its Class - Enough Margin To Obtain The Necessary Field Strength You Require
- Unsurpassed Service, Support & Warranty - Reduce Downtime To Save Money And Provide Your Customers With Testing Continuity
- Durability & Longevity - Provides Lower Life Cycle Costs
- Best Efficiency In Its Class - Reduces Operating Costs and Helps The Environment
- Great Mismatch Capability - Gives You The Power You Need For Driving Poor Loads, Allowing You To Select Lower Power Amplifiers And Saving You Money
- Multiple Control Interfaces That Some Of Our Competitors Lack – More Value For Your Money
- Unsurpassed Harmonic Rejection - Provides More Accurate Measurements
- Lower Acoustical Noise - Enhances The Work Environment
- Compact, Lightweight, Modular Designs - Ability To Fit In Small Areas/Chambers And Easily Transportable
- Intuitive Operation - Saves You Time And Money

10000W1000A
10000 Watts CW, 80 MHz - 1000 MHz



Liquid Cooling For Large High-Power RF Amplifiers

Temperature is a major factor in determining the reliability of solid state devices used in high-power RF amplifiers. Reducing the temperature that the semiconductor devices see can greatly improve both reliability and performance.

Liquid cooling not only allows for lower overall temperatures, but also offers a number of other important advantages:

- **Liquid cooling reduces the size of the amplifier**
Air-cooled amplifiers use large metal heat sinks over which air is forced to carry away heat. In a liquid-cooled amplifier, the transistors are mounted on cooling plates through which water flows. The plates are much smaller than heat sinks and because you don't have to accommodate airflow, they can be built closer together.
- **Liquid Cooling Reduces The Heat Load On The Amplifier Room**
Since most of the heat generated is carried away by the cooling liquid, HVAC requirements are reduced, which results in more comfortable surroundings and reduced utility bills.
- **Liquid Cooling Allows For Fewer Fans**
This makes the amplifier significantly quieter. By reducing the noise, operators can work in a safer, more pleasant environment without fatigue.
- **Liquid Cooling Provides The Option Of Using Your Existing Cooling Infrastructure**
Liquid cooling options include an external chiller or the use of chilled water supplied by the customer's facility. By utilizing one's existing infrastructure, operating costs can be greatly reduced.

Like everything we do at AR, liquid cooling has been carefully considered, tested and researched before being chosen as the preferred method for controlling temperatures in large high-power amplifiers. We utilize proprietary techniques to implement the most reliable and robust mechanical designs possible.

CoolAR Chillers

AR, the world leader in supplying high power, broadband amplifiers, can now supply chillers for any of its standard liquid-to-liquid cooled amplifiers such as the models 12500A225A-L and 20000A225A-L. This capability ensures amplifier performance in any operating condition, reduces the risk of inappropriately sized equipment, and eases the procurement process by working with only one vendor. Each chiller is sized for the amplifier model, taking into consideration the user's operating requirements and environment. We can also supply chillers for custom amplifiers designed to user specifications and provide a true turnkey solution.

The chillers are provisioned to handle the unique requirements of test amplifiers and to interface with the amplifier controller for monitoring of faults. Consultation for proper sizing and installation and training are included. Service is provided through a well-established, worldwide network of support distributors with over 40 years of experience.



RF Solid State Amplifiers

10 Hz to 1 MHz

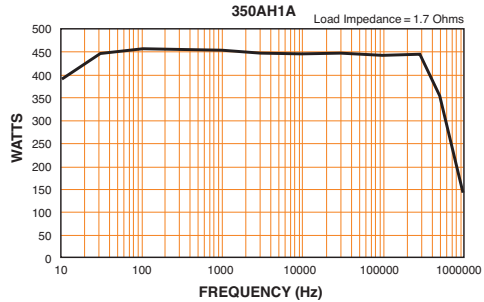
10 kHz to 3 MHz

10 kHz to 100 MHz

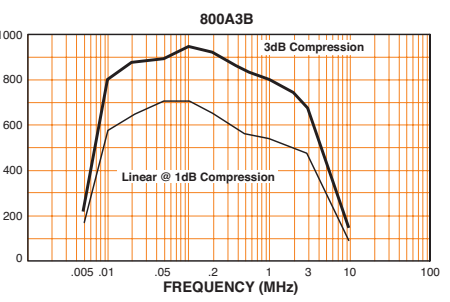
10 kHz to 225 MHz



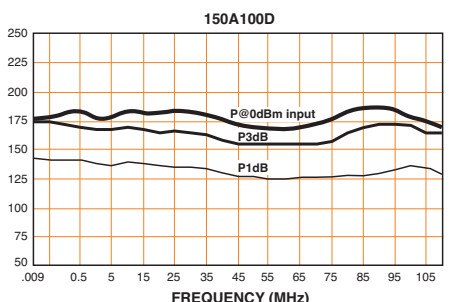
350 watts CW, 10 Hz - 1 MHz	
Operation	Class AB Linear
Power Output (1.79 Ohm load)	
CW, min.	350 watts, 10 Hz - 300 kHz
Voltage Output, min.	350 - 55 watts, 300 kHz - 1 MHz
Current Output, min.	25 Vrms, 10 Hz - 300 kHz
Flatness	25 - 10 Vrms, 300 kHz - 1 MHz
Frequency Response	14 Arms, 10 Hz - 300 kHz
Input Signal	14 - 5.5 Arms, 300 kHz - 1 MHz
Gain (Power)	±1.0 dB, 10 Hz - 300 kHz
Power Gain Control Range	±4.0 dB, 300 kHz - 1 MHz
Input Impedance	47 dB min., 10 Hz - 300 kHz
Output Impedance	39 dB min., 300 kHz - 1 MHz
Mismatch Tolerance	48 dB min.
Modulation Capability	600 ohms typ.
Will faithfully reproduce AM, FM, or pulse modulation appearing on the input signal	<1Ω typ.
Primary Power	100% of rated power without fail
Connectors	90 - 260 VAC
RF Input	47 - 63 Hz, single phase, 1200 watts max.
RF Output	
Remote Control	
IEEE-488	24 pin female
RS-232	9 pin subminiature D female
USB	Type B female
Ethernet	RJ-45
Safety Interlock	15 pin subminiature D
Cooling	Forced air (self contained fans)
Weight	25 kg (55 lb)
Size (WxHxD)	
50.3 x 19.9 x 37.6 cm / 19.8 x 7.85 x 14.8 in	



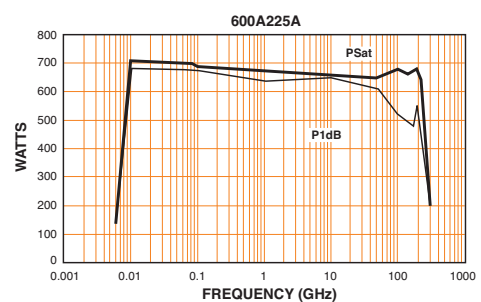
800 watts CW, 10 kHz-3 MHz	
Rated Output Power	800 watts
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 800 watts	Min. 800 watts, 10 kHz - 2 MHz
Min. 700 watts, 2 - 3 MHz	
Power Output @ 1dB compression	
Nominal 500 watts / Min. 400 watts	
Flatness	± 1.0 dB max.
Frequency Response	10 kHz - 3 MHz instantaneously
Gain (at max. setting)	60 dB min.
Gain Adjustment (continuous range)	23 dB min.
Input Impedance	50 ohms, nominal
Output Impedance (switch select; manual)	
12.5, 25, 50, 100, 150, 200, 400 ohms nominal	
(10 kHz - 3 MHz) on front panel	
Mismatch Tolerance*	Will operate without damage or oscillation with any magnitude and phase of source and load impedance. 100% of rated power without foldback up to 6.0:1 mismatch above which may limit to 400 watts reflected power.
Harmonic Distortion	Minus 20 dBc max. at 400 watts power output
Connectors	
RF Input	Type N female on front panel
RF Output	Type N female on front panel
Remote Control	
IEEE-488/RS-232, USB ability to remote control and power an external impedance transformer.	
RF Power Display	0 - 1000 watts full scale. Directional power monitor allows separate display of forward and reflected power.
Cooling	Forced air (self contained fans)
Primary Power	
190 - 240 VAC	
50 - 60 Hz, 2500 watts max.	
Weight (max.)	36.4 kg (80 lb)
Size (WxHxD)	
50.3 x 34 x 55.1 cm / 19.8 x 13.4 x 21.7 in	
For external impedance transformer options, see specification sheet for IT2000 Series impedance transformers.	



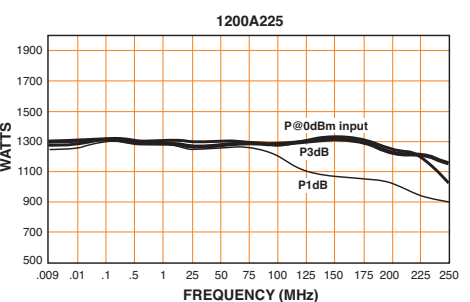
150 watts CW, 10 kHz-100 MHz	
Rated Output Power	180 watts typ., 150 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Typical: 165 watts / Min. 140 watts	
Power Output @ 1dB compression	
Typical: 135 watts / Min. 110 watts	
Flatness	±1.0 dB typ., ±1.5 dB max.
Frequency Response	10 kHz - 100 MHz instantaneously
Gain (at max. setting)	51.8 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms nominal.
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Noise Figure	8 dB typ.
Harmonic Distortion	
Minus 20 dBc max. at 100 watts	
Minus 30 dBc typ. at 70 watts	
Third Order Intercept Point	55 dBm typ.
Spurious	Minus 73 dBc typ.
Primary Power	
100 - 240 VAC	
50/60Hz	
500 watts	
Connectors	
RF Input	Type N female
RF Output	Type N female
Remote Interfaces	
IEEE-488	24-pin female
RS-232	9-pin subminiature D (female)
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B female
Ethernet	RJ-45
Safety Interlock	15-pin subminiature D
Cooling	Forced air (self contained fans)
Weight	18.5 kg (41 lb)
Size (WxHxD)	
50.3 x 15.5 x 55.1 cm / 19.8 x 6.1 x 21.7 in	



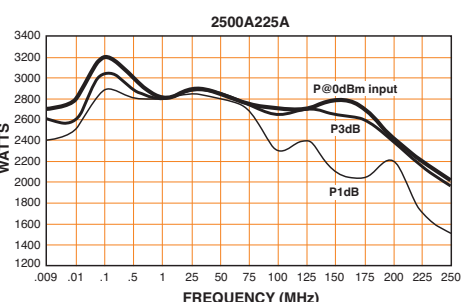
600 watts CW, 10 kHz-225 MHz	
Rated Output Power	600 watts
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 600 watts / Min. 550 watts	
Power Output @ 1dB compression	
Nominal 550 watts / Min. 400 watts	
Flatness	±2.5 dB max.
Frequency Response	10 kHz - 225 MHz instantaneously
Gain (at max. setting)	58 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% rated power without foldback up to 6.0:1 mismatch, above which may limit to 300 watts reflective power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 400 watts
Third Order Intercept Point	65 dBm typ.
RF Power Display	0 - 750 watts full scale
Primary Power	
180 - 264 VAC	
47 - 63 Hz	
2500 watts max. at .99 P.F. typ.	
Connectors	
RF Input	Type N female on front panel
RF Output	Type N female on front panel
Forward Sample	BNC female on front panel
Reverse Sample	BNC female on front panel
(coupling factor 60 dB typ.; data supplied)	
Remote Control	
IEEE-488	24 pin female on rear panel
RS-232	9 pin female Type D on rear panel
USB	Type B female
Safety Interlock	15 pin female Type D on rear panel
Cooling	Forced air (self contained fans)
Weight	45.8 kg (101 lb)
Size (WxHxD)	
50.3 x 34 x 56.9 cm / 19.8 x 13.4 x 22 in	



1,200 watts CW, 10 kHz-225 MHz	
Rated Output Power	
Typ.: 1300 watts, min. 1200 watts, .01 - 100MHz	
Typ.: 1200 watts, min. 1100 watts, 100 - 225MHz	
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Typ.: 1300 watts, min. 1200 watts, .01 - 100MHz	
Typ.: 1200 watts, min. 1100 watts, 100 - 225MHz	
Power Output @ 1dB compression	
Typ.: 1250 watts, min. 1100 watts, .01 - 100MHz	
Typ.: 1050 watts, min. 800 watts, 100 - 225MHz	
Flatness	±2.0 dB typ., ±2.5 dB max.
Frequency Response	10kHz - 225 MHz instantaneously
Gain (at max. setting)	61.8 dB min.
Gain Adjustment (continuous range)	20 dB
Input Impedance	50 ohms, VSWR 1.5:1 max.
Output Impedance	50 ohms nominal
Mismatch Tolerance	100% of rated power without foldback up to 6.0:1 mismatch, above which may limit to 600W reflected power.
Harmonic Distortion	Minus 30 dBc typical, minus 20 dBc maximum at 750 watts
Third Order Intercept Point	78 dBm typ.
Primary Power	
200 - 240 VAC single-phase	
50/60Hz	
4.6 kWatts	
Connectors	
RF Input:	N female
RF Output:	7/16 DIN female
Remote Control	
IEEE-488	24-pin female
RS-232	9-pin subminiature D (female)
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15-pin subminiature D
Cooling	
Forced air (self contained fans with internal self-contained liquid cooling)	
Weight	139 kg (305 lb)
Size (WxHxD)	
56.1 x 115 x 88.9 cm / 22.1 x 45.25 x 35 in	



2,500 watts CW, 10 kHz-225 MHz	
Rated Output Power	
Typ.: 2800 watts, min. 2500 watts, .01 - 100MHz	
Typ.: 2300 watts, min. 2000 watts, 100 - 225MHz	
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Typ.: 2800 watts, min. 2500 watts, .01 - 100MHz	
Typ.: 2300 watts, min. 2000 watts, 100 - 225MHz	
Power Output @ 1dB compression	
Typ.: 2400 watts, min. 2000 watts, .01 - 100MHz	
Typ.: 1900 watts, min. 1500 watts, 100 - 225MHz	
Flatness	±2.0 dB typ., ±2.5 dB max.
Frequency Response	10kHz - 225 MHz instantaneously
Gain (at max. setting)	64 dB min.
Gain Adjustment (continuous range)	20 dB
Input Impedance	50 ohms, VSWR 1.5:1 max.
Output Impedance	50 ohms nominal
Mismatch Tolerance	100% of rated power without foldback up to 6.0:1 mismatch, above which may limit to 1250W reflected power.
Harmonic Distortion	Minus 30 dBc typ., minus 20 dBc max. at 1750 watts
Third Order Intercept Point	85 dBm typ.
Spurious	Minus 70 dBc typ.
Primary Power (user must specify):	
200 - 240 VAC or 380 - 415 VAC 3-phase	
50/60Hz	
9.5 kWatts	
Connectors	
RF Input:	N female
RF Output:	7/16 DIN female
Remote Control	
IEEE-488	24-pin female
RS-232	9-pin subminiature D (female)
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15-pin subminiature D
Cooling	
Forced air (self contained fans with internal self-contained liquid cooling)	
Weight	159 kg (350 lb)
Size (WxHxD)	
56.1 x 115 x 88.9 cm / 22.1 x 45.25 x 35 in	



RF Solid State Amplifiers

10 kHz to 225 MHz

10 kHz to 250 MHz

5000A225A



10000A225A-A



12500A225A-L



16000A225A-A



20000A225A-L

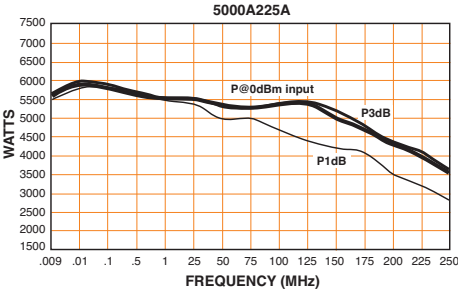


125A250



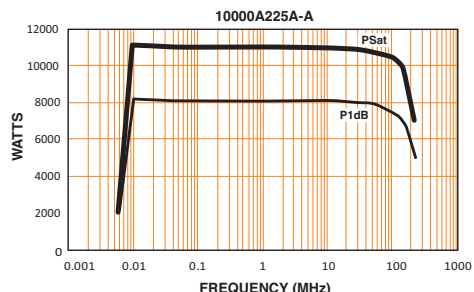
5,000 watts CW, 10 kHz-225 MHz

Rated Output Power	
Typ.:	5500 watts, min. 5000 watts, .01 - 100MHz
Typ.:	4500 watts, min. 3500 watts, 100 - 225MHz
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Typ.:	5500 watts, min. 5000 watts, .01 - 100MHz
Typ.:	4500 watts, min. 3500 watts, 100 - 225MHz
Power Output @ 1dB compression	
Typ.:	5000 watts, min. 4000 watts, .01 - 100MHz
Typ.:	4000 watts, min. 3000 watts, 100 - 225MHz
Flatness	±2.0 dB typ., ±2.5 dB max.
Frequency Response	10kHz - 225 MHz instantaneously
Gain (at max. setting)	67 dB min.
Gain Adjustment (continuous range)	20 dB
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms nominal
Mismatch Tolerance	
100% of rated power without foldback up to 6.0:1 mismatch, above which may limit to 2500W reflected power.	
Harmonic Distortion	
Minus 30 dBc typ., minus 20 dBc max. at 3000 watts	
Third Order Intercept Point	87 dBm typ.
Spurious	Minus 70 dBc typ.
Primary Power (user must specify):	
200 - 240 VAC or 380 - 415 VAC 3-phase	
50/60Hz	
20 kWatts	
Connectors	
RF Input:	N female
RF Output:	EIA 1-5/8 male, rear
Remote Control	
IEEE-488	24-pin female
RS-232	9-pin subminiature D (female)
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15-pin subminiature D
Cooling	
Forced air (self contained fans with internal self-contained liquid cooling)	
Weight	250 kg (550 lb)
Size (WxHxD)	
56.1 x 173 x 88.9 cm / 22.1 x 68.15 x 35 in	



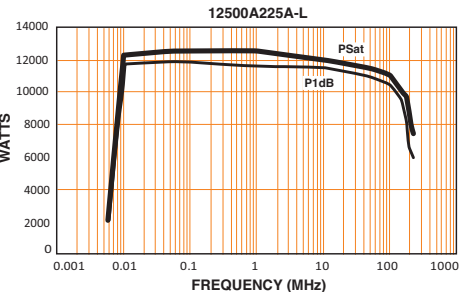
10,000 watts CW, 10 kHz-225 MHz

Rated Output Power	
Nominal	11,000 watts
Minimum	10,000 watts, .01 - 100 MHz, 6000 watts, 100 - 225 MHz
Input For Rated Output	1.0 milliwatt max.
Power Output for 1dB compression	
Nominal	8000 watts
Minimum	7000 watts, .01 - 100 MHz, 4000 watts, 100 - 225 MHz
Flatness	±3.0 dB max.
±1.0 dB with internal leveling	
Frequency Response	10 kHz - 225 MHz instantaneously
Gain (at max. setting)	70 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance	
100% rated power without foldback up to 6.0:1 mismatch above which may limit to 5000 watts reflected power, from 10 kHz to 100 MHz. Limited to 3000 watts reflected power from 100 MHz to 225 MHz.	
Harmonic Distortion	
Minus 20 dBc max. at 6000 watts	
Third Order Intercept Point	77 dBm typ.
RF Power Display	0 - 15,000 watts full scale
RF Rise/Fall Time	150 nanoseconds max.
Primary Power (user must specify):	
190 - 240 VAC, Delta (4 wire)	
380 - 480 VAC, Delta (4 wire)	
47 - 63 Hz, 3-phase	
40,000 watts max. at .95 PF typ.	
Connectors	
RF Input	Type N female on rear panel
RF Output	Type EIA 1-5/8 male on rear panel
Forward Sample	Type N female on front panel (coupling factor 80dB typ.)
Reverse Sample	Type N female on front panel (coupling factor 80dB typ.)
Pulse Modulation Input	Type BNC female on rear panel
Safety Interlock	15 pin female Type D on rear panel
Remote Control	
IEEE-488	24-pin female on rear panel
RS-232	9-pin female Type D on rear panel
RS-232 (fiber optic):	Type ST, rear panel
USB 2.0:	Type B female, rear panel
Ethernet:	RJ-45
Cooling	
Forced air (self contained fans with internal liquid cooling)	
Weight	500 kg (1100 lb)
Size (WxHxD)	
112.1 x 82.4 x 165.3 cm / 44.12 x 32.43 x 65.1 in	



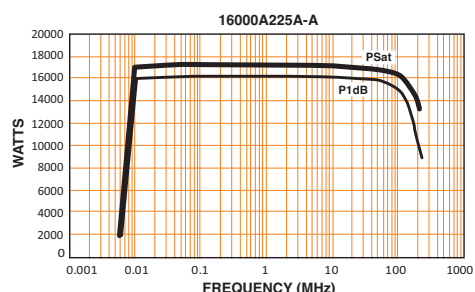
12,500 watts CW, 10 kHz-225 MHz

Rated Output Power	
Nominal	12,500 watts
Minimum	10,000 watts, .01 - 100 MHz, 6000 watts, 100 - 225 MHz
Input For Rated Output	1.0 milliwatt max.
Power Output for 1dB compression	
Nominal	11,000 watts
Minimum	10,000 watts, .01 - 100 MHz, 5000 watts, 100 - 225 MHz
Flatness	±3.0 dB max.
±1.0 dB with internal leveling	
Frequency Response	10 kHz - 225 MHz instantaneously
Gain (at max. setting)	71 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance	
100% rated power without foldback up to 6.0:1 mismatch above which may limit to 5000 watts reflected power, from 10 kHz to 100 MHz. Limited to 3000 watts reflected power from 100 MHz to 225 MHz.	
Harmonic Distortion	
Minus 20 dBc max. at 8000 watts	
Third Order Intercept Point	77 dBm typ.
RF Power Display	0 - 15,000 watts full scale
RF Rise/Fall Time	150 nanoseconds max.
Primary Power (user must specify):	
190 - 240 VAC Delta (4 wire)	
380 - 480 VAC, Delta (4 wire)	
47 - 63 Hz, 3-phase	
45,000 watts max. at .95 P.F. typ.	
Connectors	
RF Input	Type N female on rear panel
RF Output	Type EIA 1-5/8 male on rear panel
Forward Sample	Type N female on front panel (coupling factor 80dB typical)
Reverse Sample	Type N female on front panel (coupling factor 80dB typical)
Pulse Modulation Input	Type BNC female, rear panel
Safety Interlock	15 pin female Type D on rear panel
Remote Control	
IEEE-488	24 pin female on rear panel
RS-232	9-pin female Type D on rear panel
USB 2.0	Type B female, rear
Ethernet	RJ-45
Cooling	
Liquid cooled via external chilled water supply	
Weight (max.)	500 kg (1100 lb)
Size (WxHxD)	
112.1 x 82.4 x 165.3 cm / 44.12 x 32.43 x 65.1 in	
Export classification	
EAR99	



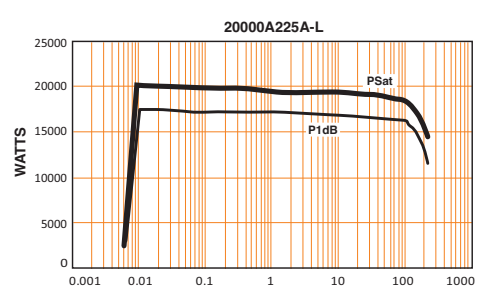
16,000 watts CW, 10 kHz-225 MHz

Rated Output Power	
Nominal	17,000 watts
Minimum	16,000 watts, .01 - 100 MHz, 12,000 watts, 100 - 225 MHz
Input For Rated Output	1.0 milliwatt max.
Power Output for 1dB compression	
Nominal	15,000 watts
Minimum	14,000 watts, .01 - 100 MHz, 5000 watts, 100 - 225 MHz
Flatness	±3.0 dB max.
±1.0 dB with internal leveling	
Frequency Response	10 kHz - 225 MHz instantaneously
Gain (at max. setting)	72.05 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	
100% rated power without foldback up to 6.0:1 mismatch above which may limit to 8000 watts reflected power from 10kHz - 100MHz. Limited to 7000 watts reflected power from 100MHz - 225MHz.	
Modulation Capability	
Will faithfully reproduce AM, FM or Pulse modulation appearing on the input signal.	
Harmonic Distortion	Minus 20 dBc max. at 10,000 watts
Third Order Intercept Point	77 dBm typ.
RF Power Display	0 - 20,000 watts full scale
RF Rise/Fall Time	150 nanoseconds max.
Primary Power (user must specify):	
190 - 240 VAC, Delta (4 wire)	
380 - 480 VAC, Delta (4 wire)	
47 - 63 Hz, 3-phase	
75,000 watts max. at .95 PF typ.	
Connectors	
RF Input	Type N female on rear panel
RF Output	Type EIA 3-1/8 male on rear panel
Forward Sample	N female, front (coupling factor 84dB typ.)
Reverse Sample	N female, front (coupling factor 84dB typ.)
Pulse Modulation Input	BNC female on rear panel
Safety Interlock	15 pin female Type D on rear panel
Remote Control	
IEEE-488:	24 pin female, rear
RS-232:	9 pin female D, rear
RS-232 (fiber optic):	Type ST, rear
USB 2.0:	Type B female, rear
Ethernet:	RJ-45
Cooling	
Forced air (self contained fans with internal liquid cooling)	
Weight	997 kg (2200 lb)
Size (WxHxD)	
226.7 x 99.1 x 177.8 cm / 89.25 x 39 x 70 in	
Export classification	
EAR99	



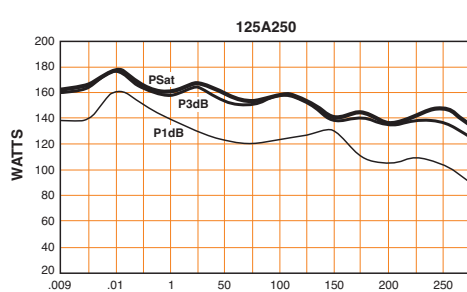
20,000 watts CW, 10 kHz-225 MHz

Rated Output Power	
Nominal	20,000 watts
Minimum	18,000 watts, .01 - 100 MHz, 13,000 watts, 100 - 225 MHz
Input For Rated Output	1.0 milliwatt max.
Power Output for 1dB compression	
Nominal	17,000 watts
Minimum	16,000 watts, .01 - 100 MHz, 10,000 watts, 100 - 225 MHz
Flatness	±3.0 dB max.
±1.0 dB with internal leveling	
Frequency Response	10 kHz - 225 MHz instantaneously
Gain (at max. setting)	72.5 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	
100% rated power without foldback up to 6.0:1 mismatch above which may limit to 9000 watts reflected power from 10kHz - 100MHz. Limited to 7000 watts reflected power from 100MHz - 225MHz.	
Modulation Capability	
Will faithfully reproduce AM, FM or Pulse modulation appearing on the input signal.	
Harmonic Distortion	Minus 20 dBc max. at 12,000 watts
Third Order Intercept Point	77 dBm typ.
RF Power Display	0 - 25,000 watts full scale
RF Rise/Fall Time	150 nanoseconds max.
Primary Power (user must specify):	
380 - 480 VAC, Delta (4 wire)	
47 - 63 Hz, 3-phase	
85,000 watts max. at .95 PF typ.	
Connectors	
RF Input	Type N female on rear panel
RF Output	Type EIA 3-1/8 male on rear panel
Forward Sample	N female, front (coupling factor 84dB typ.)
Reverse Sample	N female, front (coupling factor 84dB typ.)
Pulse Modulation Input	BNC female on rear panel
Safety Interlock	15 pin female Type D on rear panel
Remote Control	
IEEE-488:	24 pin female, rear
RS-232:	9 pin female D, rear
RS-232 (fiber optic):	Type ST, rear
USB 2.0:	Type B female, rear
Ethernet:	RJ-45
Cooling	
Liquid cooled via external chilled water supply	
Weight	997 kg (2200 lb)
Size (WxHxD)	
226.7 x 99.1 x 177.8 cm / 89.25 x 39 x 70 in	
Export classification	
EAR99	



125 watts CW, 10 kHz-250 MHz

Rated Output Power	
150 watts typ., 125 watts min.	
Input For Rated Output	
1.0 milliwatt max.	
Power Output @ 3dB compression	
Typical: 145 watts / Min. 125 watts	
Power Output @ 1dB compression	
Typical: 110 watts / Min. 90 watts	
Flatness	±1.0 dB typ., ±1.5 dB max.
Frequency Response	10 kHz - 250 MHz instantaneously
Gain (at max. setting)	50 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms nominal.
Mismatch Tolerance*	
100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.	
Noise Figure	8 dB typ.
Harmonic Distortion	
Minus 20 dBc max. at 90 watts	
Minus 30 dBc typ. at 70 watts	
Third Order Intercept Point	55 dBm typ.
Spurious	Minus 73 dBc typ.
Primary Power	
100 - 240 VAC	
50/60Hz	
500 watts	
Connectors	
RF Input	Type N female
RF Output	Type N female
Remote Interfaces	
IEEE-488	
24-pin female	
RS-232	
9-pin subminiature D (female)	
Fiber optic	
ST Conn Tx and Rx RS-232	
USB 2.0	
Type B	
Ethernet	
RJ-45	
Safety Interlock	
15-pin subminiature D	
Cooling	
Forced air (self contained fans)	
Weight	18.5 kg (41 lb)
Size (WxHxD)	
50.3 x 15.5 x 55.1 cm / 19.8 x 6.1 x 21.7 in	
Export classification	
EAR99	



500A250C



100A400A



175A400



250A400



350A400

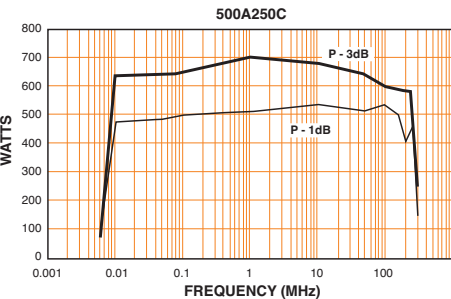


150W1000B



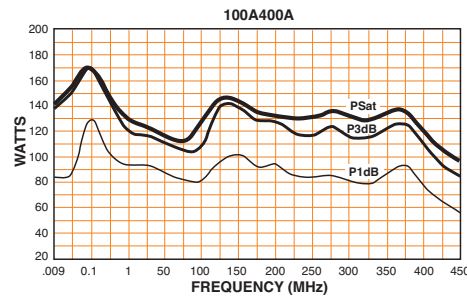
500 watts CW, 10 kHz-250 MHz

Rated Output Power	500 watts
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 600 watts / Min. 500 watts	
Power Output @ 1dB compression	
Nominal 500 watts / Min. 350 watts	
Flatness	±2.5 dB max.
Frequency Response	10 kHz - 250 MHz instantaneously
Gain (at max. setting)	57 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% rated power without foldback up to 6.0:1 mismatch, above which may limit to 250 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 350 watts
Third Order Intercept Point	65 dBm typ.
RF Power Display	0 - 750 watts full scale
Primary Power	180 - 264 VAC
	47 - 63 Hz, 2500 watts max. @ 0.99 P.F. typ.
Connectors	
RF Input	Type N female on front panel
RF Output	Type N female on front panel
Forward Sample	Type BNC female on front panel (coupling factor 60 dB typ.)
Reverse Sample	Type BNC female on front panel (coupling factor 60 dB typ.)
Pulse Modulation Input	BNC female on rear panel
Safety Interlock	15 pin female Type D on rear panel
Remote Control	
IEEE-488	24 pin female on rear panel
RS-232	9 pin female Type D on rear panel
RS-232 (Fiber optic)	Type ST on rear panel
USB	Type B female
Ethernet	RJ-45
Cooling	Forced air (self contained fans)
Weight	45.8 kg (101 lb)
Size (WxHxD)	50.3 x 34 x 56.9 cm / 19.8 x 13.4 x 22 in



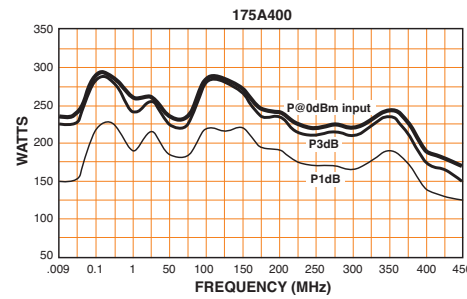
100 watts CW, 10 kHz-400 MHz

Rated Output Power	130 watts typ., 100 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Typ. 125 watts / Min. 100 watts
Power Output @ 1dB compression	Typ. 85 watts / Min. 75 watts
Flatness	±1.0 dB typ. / ±1.5 dB max.
Frequency Response	10 kHz - 400 MHz instantaneously
Gain (at max. setting)	50 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 75 watts, Minus 30 dBc typical at 50 watts
Spurious	Minus 73 dBc typ.
Third Order Intercept Point	55 dBm typ.
Noise Figure	8 dB typ.
Primary Power	100 - 240 VAC
	50 / 60 Hz, 500 watts
Connectors	
RF Input	Type N female
RF Output	Type N female
Remote Interfaces	
IEEE-488	24 pin female
RS-232	9 pin Subminiature D female
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 Pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	With cabinet 18.5 kg (41 lb)
	Without cabinet 10.4 kg (23 lb)
Size (WxHxD)	With cabinet 50.3 x 15.5 x 55.1 cm / 19.8 x 6.1 x 21.7 in
	Without cabinet 48.3 x 13.2 x 55.1 cm / 19.8 x 5.2 x 21.7 in
Export classification	EAR99



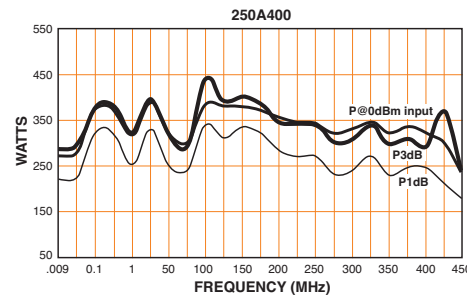
175 watts CW, 10 kHz-400 MHz

Rated Output Power	225 watts typ., 175 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Typ. 210 watts / Min. 165 watts
Power Output @ 1dB compression	Typ. 165 watts / Min. 125 watts
Flatness	±0.9 dB typ. / ±1.5 dB max.
Frequency Response	10 kHz - 400 MHz instantaneously
Gain (at max. setting)	52.5 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 150 watts
Spurious	Minus 73 dBc typ.
Third Order Intercept Point	60 dBm typ.
Noise Figure	8.5 dB typ.
Primary Power	100 - 240 VAC
	50 / 60 Hz, 770 watts
Connectors	
RF Input	Type N female
RF Output	Type N female
Remote Interfaces	
IEEE-488	24 pin female
RS-232	9 pin Subminiature D female
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 Pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	With cabinet 33 kg (73 lb)
	Without cabinet 22 kg (48 lb)
Size (WxHxD)	With cabinet 50.3 x 20.5 x 74.9 cm / 19.8 x 8.1 x 29.5 in
	Without cabinet 48.3 x 17.7 x 74.9 cm / 19 x 7 x 29.5 in
Export Classification	EAR99



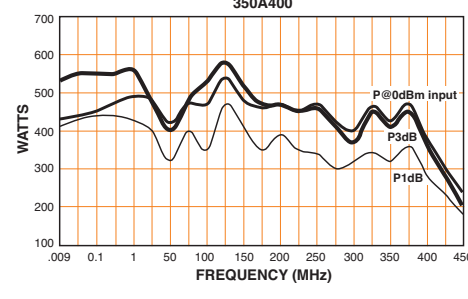
250 watts CW, 10 kHz-400 MHz

Rated Output Power	325 watts typ., 250 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Typ. 325 watts / Min. 250 watts
Power Output @ 1dB compression	Typ. 250 watts / Min. 200 watts
Flatness	±1.5 dB typ. / ±2.0 dB max.
Frequency Response	10 kHz - 400 MHz instantaneously
Gain (at max. setting)	54 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 200 watts
Spurious	Minus 73 dBc typ.
Third Order Intercept Point	65 dBm typ.
Noise Figure	8.5 dB typ.
Primary Power	100 - 240 VAC
	50 / 60 Hz, 1350 watts
Connectors	
RF Input	Type N female
RF Output	Type N female
Remote Interfaces	
IEEE-488	24 pin female
RS-232	9 pin Subminiature D female
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 Pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	With cabinet 45 kg (98 lb)
	Without cabinet 33 kg (73 lb)
Size (WxHxD)	With cabinet 50.3 x 20.5 x 74.9 cm / 19.8 x 8.1 x 29.5 in
	Without cabinet 48.3 x 17.7 x 74.9 cm / 19 x 7 x 29.5 in
Export Classification	EAR99



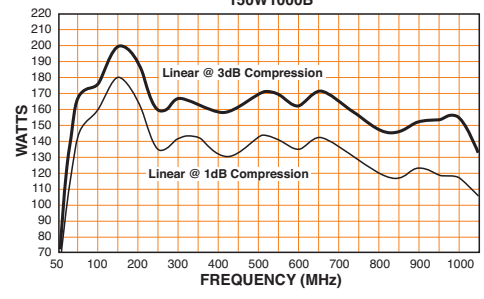
350 watts CW, 10 kHz-400 MHz

Rated Output Power	425 watts typ., 350 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Typ. 400 watts / Min. 325 watts
Power Output @ 1dB compression	Typ. 325 watts / Min. 225 watts
Flatness	±1.5 dB typ. / ±2.0 dB max.
Frequency Response	10 kHz - 400 MHz instantaneously
Gain (at max. setting)	55.5 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 2.0:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 300 watts
Spurious	Minus 73 dBc typ.
Third Order Intercept Point	65 dBm typ.
Noise Figure	8.5 dB typ.
Primary Power	100 - 240 VAC
	50 / 60 Hz, 1750 watts
Connectors	
RF Input	Type N female
RF Output	Type N female
Remote Interfaces	
IEEE-488	24 pin female
RS-232	9 pin Subminiature D female
Fiber optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 Pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	With cabinet 48 kg (104 lb)
	Without cabinet 35 kg (78 lb)
Size (WxHxD)	With cabinet 50.3 x 20.5 x 74.9 cm / 19.8 x 8.1 x 29.5 in
	Without cabinet 48.3 x 17.7 x 74.9 cm / 19 x 7 x 29.5 in
Export Classification	EAR99



150 watts CW, 80-1000 MHz

Rated Output Power	160 watts typical, 130 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Nominal 150 watts / Min. 125 watts
Power Output @ 1dB compression	Nominal 125 watts / Min. 100 watts
Flatness	±1.5 dB typ. / ±2.0 dB max.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	52 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance. See Application Note #27.
Modulation Capability	Will faithfully reproduce AM, FM, or Pulse modulation appearing on input signal.
Noise Figure	8 dB max.; 6 dB typ.
Harmonic Distortion	Minus 20 dBc maximum at 100 watts; minus 30 dBc typical at 100 watts
Third Order Intercept Point	58 dBm typ.
Spurious	Minus 73 dBc typ.
Primary Power	100-240 VAC,
	50/60Hz, 650 watts
Connectors	
RF Input	Type N female on front panel
RF Output	Type N female on front panel
Remote Interfaces	
IEEE-488	24 pin female
RS-232	9 pin Subminiature D (female)
Fiber Optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	With cabinet 36.7 kg (81 lbs)
	Without cabinet 25.4 kg (56 lbs)
Size (WxHxD)	With cabinet 50.3 x 20.5 x 74.9 cm / 19.8 x 8.1 x 29.5 in
	Without cabinet 48.3 x 17.7 x 74.9 cm / 19 x 7.0 x 29.5 in
Export Classification	EAR99

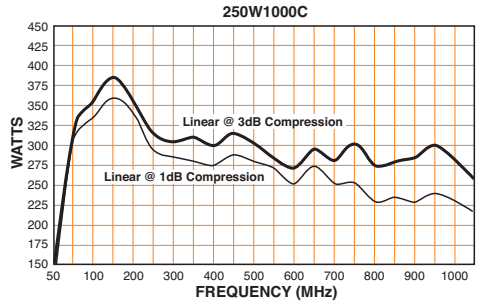


RF Solid State Amplifiers
80 to 1000 MHz



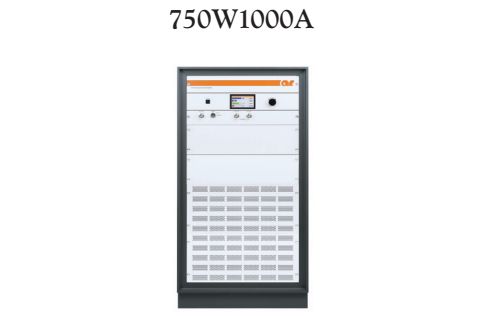
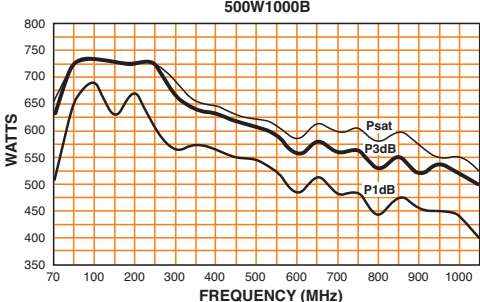
250 watts CW, 80-1000 MHz

Rated Output Power	250 watts
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Typical: 300 watts, Minimum: 275 watts up to 500 MHz;	
250 watts 500-1000MHz	
Power Output @ 1dB compression	
Typical: 250 watts, Minimum: 225 watts up to 500 MHz;	
200 watts 500-1000MHz	
Flatness	±2.0 dB max. / 1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	59 dB min.
Gain Adjustment (continuous range)	20 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.
Output Impedance	50 ohms, nominal
Mismatch Tolerance	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance. See Application Note #27.
Modulation Capability	Will faithfully reproduce AM, FM, or Pulse modulation appearing on input signal.
Noise Figure	8 dB max.; 6 dB typ.
Harmonic Distortion	Minus 20 dBc maximum at 200 watts; minus 30 dBc typical at 200 watts
Third Order Intercept Point	62 dBm typ.
Spurious	Minus 73 dBc typ.
Primary Power	100-240 VAC 50/60Hz, 1000 watts
Connectors	
RF Input	Type N female on front panel
RF Output	Type N female on front panel
Remote Interfaces	
IEEE-488	24 pin female
RS-232	9 pin Subminiature D (female)
Fiber Optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 pin Subminiature D
Cooling	Forced air (self contained fans)
Weight	42.6 kg (94 lbs)
Size (WxHxD)	50.3 x 20.5 x 74.9 cm / 19.8 x 8.1 x 29.5 in
Export Classification	EAR99



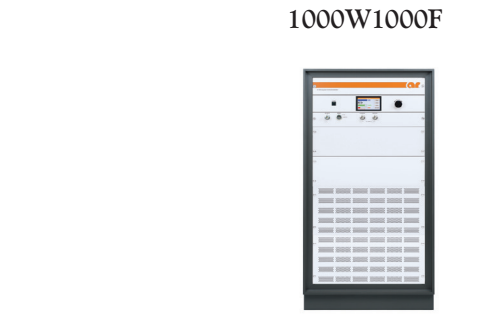
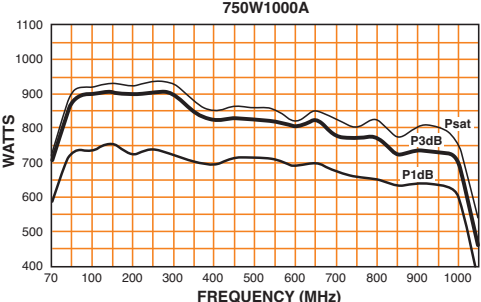
500 watts CW, 80-1000 MHz

Rated Output Power	500 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 575 watts, 525 watts min. up to 500 MHz;	
475 watts min. from 500 to 1000 MHz	
Power Output @ 1dB compression	
Nominal 500 watts, 450 watts min. up to 500 MHz;	
400 watts min. from 500 to 1000 MHz	
Flatness	±1.5 dB max. / ±1.0 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	57 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typical.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 400 watts, -20 dBc typ. at 500 watts
Third Order Intercept Point	63 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (specify voltage):	120-240 VAC, 50/60 Hz, single phase, 2200 watts
Connectors	
RF Input	Type N on front panel
RF Output	Type N female on front panel
Forward Sample	BNC female, front (-50 dBc)
Reverse Sample	BNC female, front (-50 dBc)
Safety Interlock	15 pin subminiature D on rear panel
USB 2.0	Type B
Ethernet	RJ-45
Cooling	Forced air (self contained fans), enters front and bottom
Weight	86.2 kg (190 lb)
Size (WxHxD)	50.3 x 47 x 61 cm / 19.8 x 18.5 x 24 in



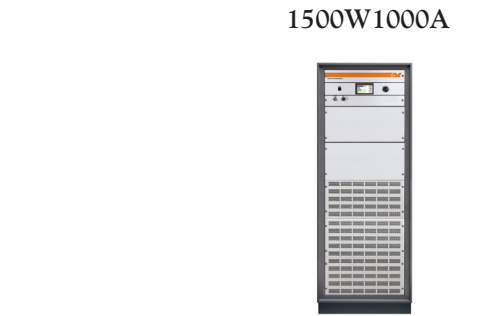
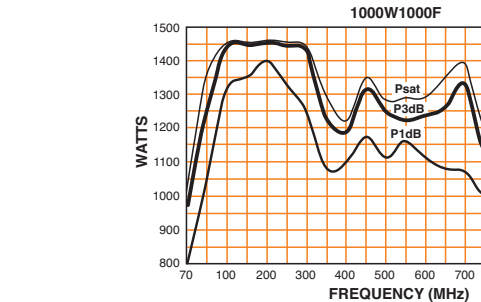
750 watts CW, 80-1000 MHz

Rated Output Power	750 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 900 watts / 775 watts min. up to 500 MHz;	
725 watts from 500 to 1000 MHz	
Power Output @ 1dB compression	
Nominal 750 watts / 700 watts min. up to 500 MHz;	
600 watts from 500 to 1000 MHz	
Flatness	±1.5 dB max. / ±1.0 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	58.8 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 600 watts, -20 dBc typ. at 750 watts
Third Order Intercept Point	64 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (user must specify)	200 - 240 VAC 50 / 60 Hz, single phase, 3200 watts
Connectors	
RF Input	Type N female on front panel
RF Output	Type 7/16 female on rear panel
Forward Sample	N female, front (-60 dBc)
Reverse Sample	N female, front (-60 dBc)
Remote Interfaces:	
IEEE-488	24-pin female
RS-232	9-pin Subminiature D, female
Fiber Optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	120 kg (263 lb)
Size (WxHxD)	56.1 x 127 x 83 cm / 22.1 x 50 x 32.4 in



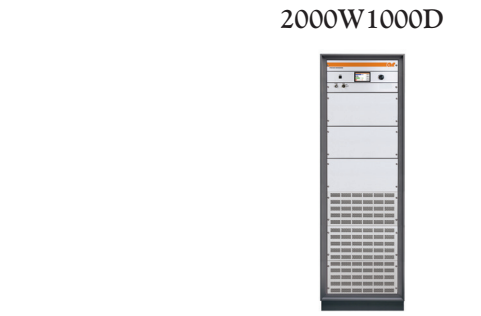
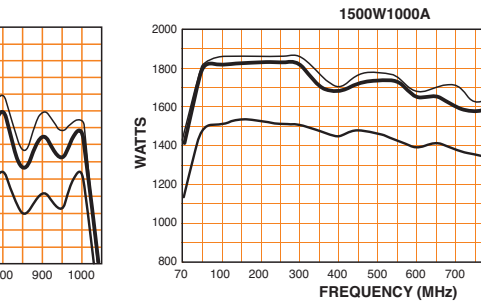
1,000 watts CW, 80-1000 MHz

Rated Output Power	1000 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 1200 watts / 1100 watts min. up to 500 MHz;	
950 watts from 500 to 1000 MHz	
Power Output @ 1dB compression	
Nominal 950 watts, 950 watts min up to 500 MHz,	
800 watts from 500 to 1000 MHz	
Flatness	±1.5 dB max; ±1.0 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	60 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 800 watts, -20 dBc typ. @ 1000 watts
Third Order Intercept Point	66 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power	200 - 240 VAC, 50 / 60 Hz, single phase, 5000 watts
Connectors	
RF Input	Type N female on front panel
RF Output	Type 7/16 female on rear panel
Forward Sample	BNC female, front (-60 dBc)
Reverse Sample	BNC female, front (-60 dBc)
Safety Interlock	15 pin subminiature D on rear panel
USB 2.0	Type B
Ethernet	RJ-45
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	124.8 kg (275 lb)
Size (WxHxD)	56.1 x 127 x 83 cm / 22.1 x 50 x 32.4 in



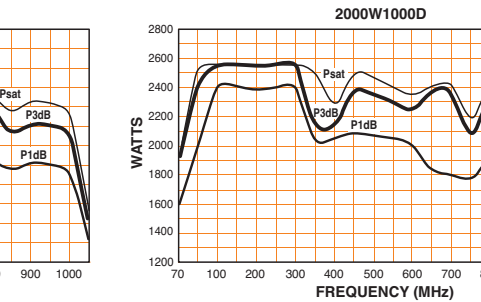
1,500 watts CW, 80 -1000 MHz

Rated Output Power	1500 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 1600 watts / 1500 watts min. up to 700 MHz;	
1400 watts from 700 to 1000 MHz	
Power Output @ 1dB compression	
Nominal 1450 watts / 1400 watts min. up to 700 MHz;	
1250 watts min. from 700 to 1000 MHz	
Flatness	±2.0 dB max. / ±1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	61.8 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 1350 watts, -20 dBc typ. at 1500 watts
Third Order Intercept Point	68 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (user must specify)	200 - 240 VAC 50 / 60 Hz, 3 phase, 7000 watts
Connectors	
RF Input	Type N female on rear panel
RF Output	Type 1 5/8 female on rear panel
Forward Sample	Type N female, front (-63 dBc)
Reverse Sample	Type N female, front (-63 dBc)
Remote Interfaces:	
IEEE-488	24-pin female
RS-232	9-pin Subminiature D, female
Fiber Optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	182 kg (400 lb)
Size (WxHxD)	56.1 x 175.3 x 97.6 cm / 22.1 x 69 x 38.4 in

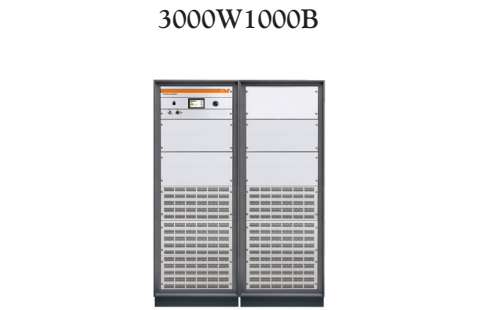


2,000 watts CW, 80 -1000 MHz

Rated Output Power	2000 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	
Nominal 2100 watts / 2000 watts min. up to 500 MHz;	
1650 watts from 500 to 1000 MHz	
Power Output @ 1dB compression	
Nominal 1850 watts / 1750 watts min. up to 500 MHz;	
1400 watts min. from 500 to 1000 MHz	
Flatness	±2.0 dB max. / ±1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	63 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 1600 watts, -20 dBc typ. at 2000 watts
Third Order Intercept Point	70 dBm typ.
Primary Power (user must specify)	200 - 240 VAC, Delta-connected (4-wire) 380 - 415 VAC, Wye-connected (5-wire) 50 / 60 Hz, 3 phase, 9000 watts
Connectors	
RF Input	Type N female on rear panel
RF Output	Type 1 5/8 female on rear panel
Forward Sample	N female, front (-63 dBc)
Reverse Sample	N female, front (-63 dBc)
Remote Interfaces:	
IEEE-488	24-pin female
RS-232	9-pin Subminiature D, female
Fiber Optic	ST Conn Tx and Rx RS-232
USB 2.0	Type B
Ethernet	RJ-45
Safety Interlock	15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans)
Weight (approximate)	218 kg (480 lb)
Size (WxHxD) (3 cabinets)	56.1 x 173 x 82.3 cm / 22.1 x 68 x 32.4 in

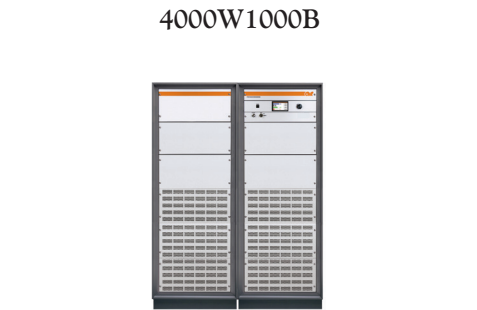
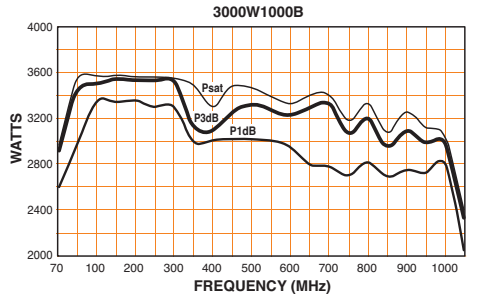


RF Solid State Amplifiers
80 to 1000 MHz



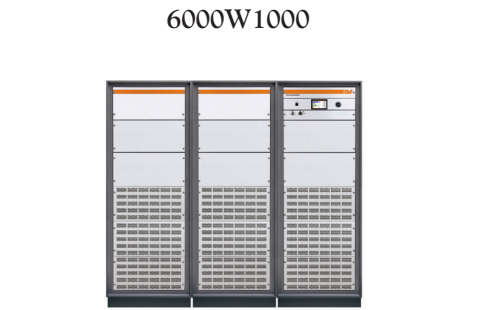
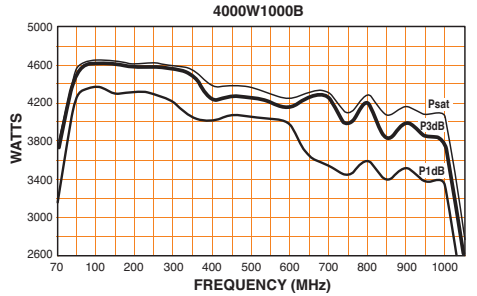
3,000 watts CW, 80-1000 MHz

Rated Output Power	2800 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Nominal 3000 watts / 2600 watts min. up to 500 MHz; 2400 watts from 500 to 1000 MHz
Power Output @ 1dB compression	Nominal 2500 watts / 2250 watts min. up to 500 MHz; 1850 watts from 500 to 1000 MHz
Flatness	±2.0 dB max. / ±1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	64.8 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback up to 6.0:1 mismatch above, which may limit to 1500 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 2400 watts, -20 dBc typ. at 3000 watts
Third Order Intercept Point	72 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (user must specify)	200 - 240 VAC 360 - 435 VAC Wye connected (5-wire) 50 / 60 Hz, 3 phase, 14kVA
Connectors	RF Input Type N female on rear panel RF Output Type 1 5/8 female on rear panel Forward Sample Type N female, front (-70 dBc) Reverse Sample Type N female, front (-70 dBc) Remote Interfaces: IEEE-488 24-pin female RS-232 9-pin Subminiature D, female Fiber Optic ST Conn Tx and Rx RS-232 USB 2.0 Type B Ethernet RJ-45 Safety Interlock 15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	364 kg (800 lb)
Size (WxHxD) (2 joined cabinets)	111.8 x 177.8 x 82.3 cm / 44 x 70 x 32.4 in



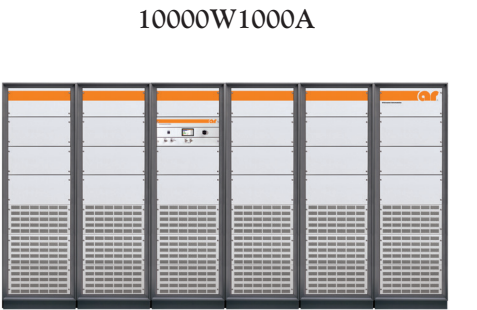
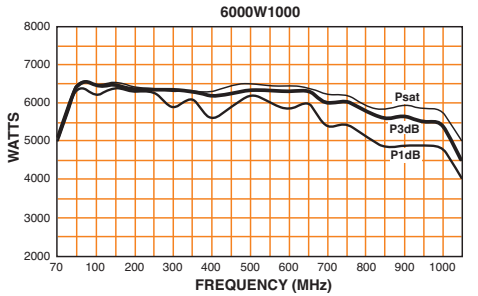
4,000 watts CW, 80-1000 MHz

Rated Output Power	3700 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Nominal 4000 watts / 3600 watts min. up to 500 MHz; 3400 watts from 500 to 1000 MHz
Power Output @ 1dB compression	Nominal 3500 watts / 3000 watts min. up to 500 MHz; 2500 watts from 500 to 1000 MHz
Flatness	±2.0 dB max. / ±1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	66 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback up to 6.0:1 mismatch above, which may limit to 2000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 3400 watts, -20 dBc typ. at 4000 watts
Third Order Intercept Point	73 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (user must specify)	200 - 240 VAC 360 - 435 VAC Wye connected (5-wire) 50 / 60 Hz, 3 phase, 17.5kVA
Connectors	RF Input Type N female on rear panel RF Output Type 1 5/8 female on rear panel Forward Sample Type N female, front (-70 dBc) Reverse Sample Type N female, front (-70 dBc) Remote Interfaces: IEEE-488 24-pin female RS-232 9-pin Subminiature D, female Fiber Optic ST Conn Tx and Rx RS-232 USB 2.0 Type B Ethernet RJ-45 Safety Interlock 15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	432 kg (950 lb)
Size (WxHxD) (2 joined cabinets)	111.8 x 177.8 x 82.3 cm / 44 x 70 x 38.4 in



6,000 watts CW, 80-1000 MHz

Rated Output Power	6000 watts min.
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Nominal 6000 watts / 5500 watts min. up to 700 MHz; 5100 watts from 700 to 1000 MHz
Power Output @ 1dB compression	Nominal 5500 watts / 5000 watts min. up to 700 MHz; 4500 watts from 700 to 1000 MHz
Flatness	±2.0 dB max. / ±1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	67.8 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback up to 6.0:1 mismatch above, which may limit to 3000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Harmonic Distortion	Minus 20 dBc max. at 5500 watts, -20 dBc typ. at 6000 watts
Third Order Intercept Point	75 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (user must specify)	200 - 240 VAC Delta connected (4-wire) 360 - 435 VAC Wye connected (5-wire) 50 / 60 Hz, 3 phase, 24kVA
Connectors	RF Input Type N female on rear panel RF Output Type 1 5/8 female on rear panel Forward Sample Type N female, front (-70 dBc) Reverse Sample Type N female, front (-70 dBc) Remote Interfaces: IEEE-488 24-pin female RS-232 9-pin Subminiature D, female Fiber Optic ST Conn Tx and Rx RS-232 USB 2.0 Type B Ethernet RJ-45 Safety Interlock 15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	703 kg (1550 lb)
Size (WxHxD) (3 joined cabinets)	170 x 183 x 99 cm / 67 x 72 x 39 in
Export classification	EAR99



10,000 watts CW, 80-1000 MHz

Rated Output Power	Nominal, 12500 watts 12000 watts min. up to 700 MHz 10500 watts min., 700 to 1000 MHz
Input For Rated Output	1.0 milliwatt max.
Power Output @ 3dB compression	Nominal 12500 watts / 12000 watts min. up to 700 MHz; 10000 watts from 700 to 1000 MHz
Power Output @ 1dB compression	Nominal 11000 watts / 10500 watts min. up to 700 MHz; 9500 watts from 700 to 1000 MHz
Flatness	±2.0 dB max. / ±1.5 dB typ.
Frequency Response	80 - 1000 MHz instantaneously
Gain (at max. setting)	70 dB min.
Gain Adjustment (continuous range)	25 dB min.
Input Impedance	50 ohms, VSWR 1.5:1 max.; 1.3:1 typ.
Output Impedance	50 ohms, nominal
Mismatch Tolerance*	100% of rated power without foldback, up to 6.0:1. Mismatch above which may limit to 6000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.
Modulation Capability	Faithfully reproduces AM, FM, or Pulse modulation appearing on input signal.
Harmonic Distortion	Minus 20 dBc max. at 10000 watts, -25 dBc typ. at 10000 watts
Third Order Intercept Point	78 dBm typ.
Noise Figure	8 dB max., 6 dB typ.
Primary Power (specify voltage)	200 - 240 VAC Delta connected (4-wire), 360 - 435 VAC Wye connected (5-wire) 50 / 60 Hz, three phase, 48000W
Connectors	RF Input Type N female on rear panel RF Output Type 4-1/16 EIA, rear panel Forward Sample N female, front (-70 dBc) Reverse Sample N female, front (-70 dBc) Remote Interfaces: IEEE-488 24-pin female RS-232 9-pin Subminiature D, female Fiber Optic ST Conn Tx and Rx RS-232 USB 2.0 Type B Ethernet RJ-45 Safety Interlock 15 pin female subminiature D, rear panel
Cooling	Forced air (self contained fans), enters front and bottom
Weight (approximate)	1407 kg (3100 lbs)
Size (WxHxD)	340 x 183 x 99 cm / 134 x 72 x 39 in
Export classification	EAR99

