Amplifiers

Model 499

Features:

- 6 kW typical pulse, 6 – 18 GHz
- Class AB design
- Full VSWR tolerant
- Degradation Mode
- Built-in fault monitoring, logging and protection
- Touch screen display
- Forward and reverse power monitoring
- VSWR monitor with user settable limit
- User settable ALC
- Remote control: Ethernet, USB, GPIB, fiber-optic serial, RS-232
- Modular design for easy maintenance and service
- CE & RoHS Compliant
- High Efficiency

Applications:

- EMC Test applications
- EW Communication/Test/Jamming
- RADAR
- Science

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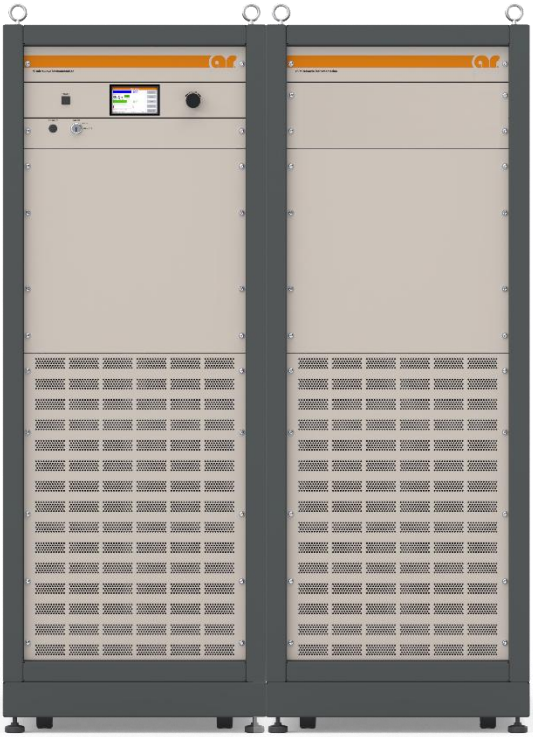
ISO 9001:2015 Certified
ISO 17025 :2017 Accredited

The Model 499 is a solid-state, Class AB design, self-contained, air-cooled, broadband power amplifier designed for pulse applications at low duty factors where instantaneous bandwidth and high gain are required. It will provide 6 kilowatts (typical) across its operating bandwidth of 6.0 – 18.0 GHz.

The Model M499 is equipped with a Digital Control Panel (DCP) which provides both local and remote control of the amplifier. The DCP uses a color LCD touch screen and a single rotary knob to offer status reporting and control capability. The display provides Forward Power and Reflected Power values plus amplifier status. Special features include a gain control and RF output level protection.

Protection is provided from various failure conditions including over-temperature and power supply faults. A front panel display indicates the operational status and fault conditions. All amplifier control functions and status indications are available remotely in GPIB/IEEE-488 format, RS-232 serial and Ethernet. The bus interface connector is located on the back panel and positive control of local or remote operation is assured by a keylock on the front panel of the amplifier.

The export classification for this equipment is 3A999.d. These commodities, technology or software are controlled for export in accordance with the U.S. Export Administration Regulations. Diversion contrary to U.S. law is prohibited.



Electrical Specifications

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Rated Power Output (6.0 - 12.0 GHz) @ DC 10% - PW 100 us	PSAT	5	6	8	kW
Rated Power Output (12.0 – 18 GHz) @ DC 10% - PW 100 us	PSAT	4	5	6.5	kW
Input for Rated Output	Pin			1	mW
				0	dBm
Operating Frequency	BW	6		18	GHz
Gain (Small Signal)		68	71	75	dB
Gain Reduction Adjustment (when below compression)		20			dB
Flatness (@ rated power)	ΔG		±1.5	±2.5	dB
Input Impedance	Z in		50		Ohm
			2.0:1	≤2.5:1	VSWR
Output Impedance	Z out		50		Ohm
Noise Figure	NF	8	10	≤12	dB
Harmonic Distortion @ rated output power	H2, H3	-	- 20	≤-17	dBc
Spurious			≤-60		dBc
Power Consumption at 10% duty cycle	PD		10	12	kVA
Modulation	AM, FM or Pulse				

Pulse Capability

Parameter	Value
Pulse Width	100 µs maximum
Pulse Rate	10 kHz maximum
Duty Cycle	10% maximum, ambient temperature < 25°C 8% maximum, ambient temperature < 30°C 6% maximum, ambient temperature < 40°C
RF Rise and Fall	20 ns maximum (10 - 90 %)
Delay	1 µs min. from pulse input to RF 90%
Pulse Width Distortion	±25 ns maximum (difference between Pulse input gate and RF pulse)
Pulse Off Isolation	35 dB minimum @ 18 GHz; 50 dB typical
Pulse Trigger	+5 V nominal / +3 to 6 V, 50 Ohm input

Absolute Maximum Rating

Exceeding any of the limits listed here may result in permanent damage to the device.

Parameter	Minimum	Typical	Maximum	Unit
RF Drive			+13	dBm
RF Load Mismatch up to rated output power	1:0	-	3:1	VSWR
Maximum admissible reflected power Will operate without damage or oscillation when connected to any load impedance without the aid of foldback circuitry up to 1.6 kW reflected Power. Alarm and protection when reflected power is > 1.2 kW (VSWR ≥3:1)			25	%
AC Power (3-phase) High voltage option	380		415	Vac
AC Power - Frequency	47		63	Hz
Ambient Temperature	+5	+25	+40	°C
Storage Temperature	-20		+50	°C
Altitude			1000	m
Shock/Vibration	Normal Truck Transport			

Mechanical Specifications

Parameters	Typical	Unit
Amplifier Dimensions (With Rack) (W x H x D) **(2 x 19" X 30U Rack)**	113 x 133.35 x 95.5	cm
	45.2 x 52.5 x 37.6	in
System Amplifier Weight	725	kg
	1600	lb
Cooling	Forced air (self-contained fans) Side inlets / rear outlet Δt = +7°C (typical)	
Acoustical Noise (Measured @ 1 meter from the front)	75 (typical)	dBA

Connector interfaces

Function	Type
RF input	Rear panel N-female, (50 Ω)
RF output	Rear Panel WRD650 UG
RF sample	Rear Panel N-female (50 Ω), (60 dB typical)
Pulse Input	BNC, rear
IEEE-488	24-pin, front
RS-232	9-pin subminiature D female, front
Ethernet	RJ-45, front
RS-232 (fiber optic)	ST, front
USB 2.0 Type B	Type B, front
Interlock	15-pin subminiature D female, front

Regulatory Compliance	
Type	**Standard**
EMC	EN 61326-1
Safety	UL 61010-1
	CAN/CSA C22.2 #61010-1
	CENELEC EN 61010-1
RoHS	Directive 2011/65/EU
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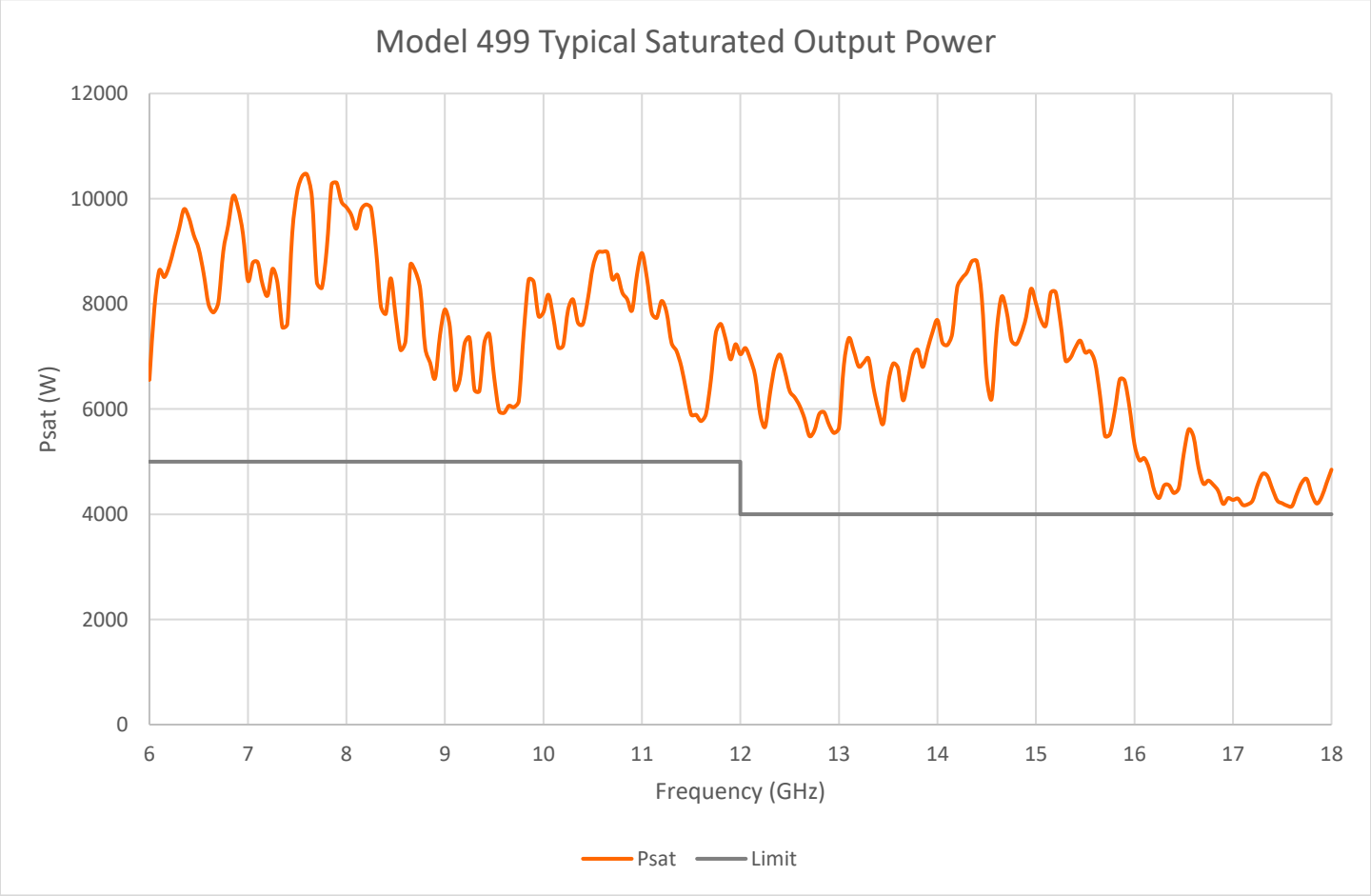
Power Graph