



HF Power Amplifier 1.6-30MHz 5kW CW/Pulsed Power

Special Features include:

- Hot Swappable SSPAs
(8 amps, each with 625W output)
- Modular Power Supplies
(8 Units with 2KW each)
- Remote monitoring with BITE
(Built-In Test Equipment)
- Redundancy: Full rated power,
even if one SSPA/PSU fails.



This is a High Power 1.6 to 30MHz Amplifier, that is one of a family of highly efficient, linear Class A/AB amplifier, that uses the latest, state of the art LD MOS and latest GaN (Gallium Nitride) technology. **This amplifier is capable of delivering pulsed or continuous (CW) operation, at up to 5KW output.** It has 8 hot-swappable, 625W SSPAs (Solid State Power Amplifiers). Each SSPA has a built-in switchable, low pass filter to ensure a clean output signal. The outputs of the 8 modules are then combined for to deliver the rated output power

The **PSUs (Power Supply Units) are also hot swappable**, consisting of 8 PSUs, each delivering 2KW of DC Power. All of the PSUs are constantly monitored, and all critical data is available via internet (read only) or by interactive RS232//USB link locally.

The SSPA/PSUs are controlled by a microcontroller that monitors all the critical functions. This microcontroller has the ability to receive requests and data **from the driving exciter to pre-tune the amplifier (at any specific frequency) for greatest efficiency and signal purity.** The microcontroller also enables *BITE* (Built In Test Equipment) functions, providing continuous SSPA monitoring of all critical operating parameters that can be read with an Ethernet connection. Monitoring of the amplifier may be done by the customer over the Internet. In addition, it incorporates front panel metering for the SSPA voltages and current for each of the 8 x SSPA modules.

The amplifier may be driven to full power with 100mW from the host exciter. It has a built in Automatic Level Control (ALC) for producing a level output as well as a controlled rollback of power due to rising VSWR, **it can withstand VSWR's up to 60:1, with full protection from excessive VSWR.** It can also be supplied with an optional Raditek exciter (high speed synthesizer). The SSPA array will be automatically optimized for optimal performance for any given (in range) frequency, with dynamic frequency info supplied by the exciter.

Power amplifier redundancy: Full rated output power is available, even if *one* SSPA or PSU should fail for any reason.

Order Examples: RAMP-R-1.6-30M-Nf-57d(120-240)V-5KW-cw-opt-d16

Description: (SSPA, Rack, HF1.6-30MHz, N female connectors, 57dBm Gain, 120-240VAC **5KW Continuous**)

Options: **5KW Pulsed**

Additional Options:

- 1) AC1 85-265V AC Single Phase, AC2 342-418 V AC 3 Phase, AC3 375-456 VAC 3 Phase
- 2) 55dBa Low Noise fans
- 3) High Frequency Switch time: 20ms
- 4) Certified to MIL-Std-188-141
- 5) Front panel Keyboard
- 6) USB Exciter Interface

RAMP-R-1.6-30M-Nf-57d(120-240)V-5KW CW-opt-d16 Specifications may be subject to change 02/11/14

WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

HF Power Amplifier 1.6-30MHz 5kW CW/Pulsed

Special Build: RAMP-R-1.6-30M-57d(120-240)V-5KWCW--AC3 k1-d16 (see table below)

Description: (SSPA, 1.6-30MHz, 5kW CW / Pulse Power, Option AC3-k1 (includes options 1, 2, 3 &4)

| Option 1 | Option 2 | Option 3 | Option 4 |
|---|----------------------------|--|----------------------------------|
| AC Line input 3 phase 342-418 VAC at 28A or 375- 456 VAC | 55dBa Low Noise fans | High Frequency Switch time: 20ms | Certified to MIL-Std- 188-141 |

| Specifications | |
|---|---|
| Frequency Range | 1.6-30 MHz |
| Frequency change time: | <40ms (standard), <20ms optional |
| Output Power | 5KW PEP(Peak Envelope Power) and Average Power with VSWR handling up to 60:1 (fully protected) |
| Key Control | RF Power is within ± 1 dB of steady state level in less than 10 ms after keyed ON RF power is reduced by more than 50 dB within 5 ms after keyed OFF |
| Input Power | 100 mW for Full Output Power , 1mW average for rated power output |
| ALC Range: | Can control output power to within +/- 0.5 dB, <i>even if one amplifier or its PSU fails!</i> |
| Gain Variation | 1.5dB maximum over frequency range |
| Input Impedance | 50 Ω (1.5:1 VSWR) |
| VSWR Rollback (Turndown) | Adjustable e.g. at 3:1, amplifier can set to operate into up to 60:1 VSWR. |
| Spurious Emissions: | <-60dBc within $\pm 5\%$ of operating frequency and <-80 dBc at beyond $\pm 5\%$ of operating frequency |
| Harmonic Levels: | <-65 dBc at rated power (into a 50 Ω load) |
| 3rd order IMD: | <32 dBc below PEP |
| RF Noise | <- 75 dBc/Hz below the rated 5KW output signal |
| Power | |
| Power Supply | Modular (8 x 2KW DC), all are hot swappable |
| AC Line Input (Single phase) STD. | 1 phase or 3 x (shared) phase standard 85-265 VAC Single (~40A) (or 185-379 VDC) (Option: AC1) |
| AC Line Input: (3 phase) Delta (Optional) | 480V 1 Phase (01) or 3 phase 342 -418 VAC at 28A nominal (Option: AC2) or 3 Phase 375-456 VAC at 27A nominal (Option: AC3) |
| Power Supply Efficiency | 92% typically |
| Monitors | |
| Monitoring/control: | Dual Analog Monitors providing Forward/Reflected Power and Power Amplifier Voltage and Current |
| Indicator LEDs | Front Panel Monitoring and remote monitoring via Built in Test Equipment |
| Control | RS232/ RS422/RS485 (standard) Ethernet Read only, USB to exciter ALC to the external exciter BIT parameters via serial bus |
| Monitor Interface | Transmitter RS232/485, USB interface Optional and Ethernet (read only) |
| Metering | Dual Analog Meters providing, Forward/Reflected Power and Power Amplifier Voltage/Current |

RAMP-R-1.6-30M-Nf-57d(120-240)V-5KWCW-opt-d16 Specifications may be subject to change

02/11/14

WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

HF Power Amplifier 1.6-30MHz 5kW CW/Pulsed

| Size and Weight | |
|----------------------------------|---|
| Dimensions: | 70.31" (H) x 31.5" (D) x 23.0" (W) , Standard 19" rack |
| Weight | < 800 Lb |
| Certification: | |
| Designed to meet MIL-STD-188-141 | Full Certification (Optional) |
| Interfaces | |
| TX Interface | Transmitter RS232/485/USB Note: USB with an adapter. |
| Monitoring Interface | Ethernet local (read only with RS485); interactive if no RS485. |
| Connectors | RF In (Type N female standard) others as options RF Out (7/16" standard) others as options |
| Monitor & Control | RS232/ RS485 (standard) USB (with an adapter), Ethernet (Option) |
| Environmental | |
| Altitude: | Operating: 0-10,000 ft. ASL (not airborne) Non-operating: 0-50,000 ft |
| Temperature | Operating over 0-50°C at sea level Operating: maximum temp. de-rated linearly to + 20 °C at 10,000 ft Non operating: -40 to + 60°C |
| Humidity | 0-95% relative humidity, non-condensing |
| Cooling | Internal Forced Air Cooling (from bottom to top of rack. Requires ~4inches headroom above the rack to exhaust hot air.) Ideally 4" at base of Rack for air flow |
| Acoustic Noise: | 65dBa normal, Option: 55dBa fans can be installed |

Example of a recent advertisement:-

RADITEK inc
HIGH POWER, LINEAR SSPA
 Raditek can provide similar amplifiers to 20 GHz, with BITE (Built-in Test equipment), and built in protection-it will supply rated power even with any (one) SSPA or Supply failure.
 Installer to supply Airconditioning OR we can supply water cooling version.



Contact:
RADITEK inc
408 266 7404
or
sales@raditek.com

Ad is from Page 46, High Frequency Electronics June 2013

Amplifier

RADITEK's new, 2.5 KW Pulsed or CW (with 0dBm in), linear, High Power GaN and LDMOS SSPA, "RAMP-1.7 - 2.1 GHz - 2.5 KW - 400VAC3P-d16" is the latest in a series of GaN and/or LDMOS amplifiers that have a lower price, better MTBF (>50,000 hrs) and MTTR (<30 minutes) than, for example, any Klystron based amplifier.

This amplifier is pre-optimized to deliver full power across any (pre specified) 100 MHz band, within 1.7 to 2.1 GHz. Cooling can be either chilled air or optionally water cooled.

RADITEK
 raditek.com

HF Power Amplifier 1.6-30MHz 5kW CW/Pulsed

- This wideband, multi-octave, high power (SSPA) amplifier, includes automatic amplifier tuning. It was originally intended for use with a single cw carrier at a time. With the exciter option, the fastest tuning is possible as the amplifier stages can be pre-tuned, by the exciter for the fastest tuning time.
- The 20ms Option is possible for a single carrier change time; or for multiple carriers close to each other (ie within the same amplifier octave tuning range).

RADITEK Power Amplifier Product line:

Driven by customer demand, Raditek is rapidly growing a high power SSPA product line. We do not want to have any "Me too" products, if we can help it. So we include various special options, such as different power supply options (1 phase, 3 phase etc) and even fan noise options.

We can offer either a) Air cooled or b) Water cooled options also. Water cooling allows the amplifier to sit in a non air conditioned (cooled) room, even a very small room, with the water to air heat exchanger at some other close-by location.

There is a new standard family of housings (see below), depending on output power and cooling options: Smaller housing is to 200W for example, middle sized one to 1KW and the largest size is to 5KW, typically. For water cooled versions, the fan units at the top will not be needed, of course.

Note that there are data access options, including front panel keypad option. LCD display showing Output power is standard.

1. Ethernet only (2 way)
2. Ethernet (Read only) and RS485 (2 way)

HF Power Amplifier 1.6-30MHz 5kW CW/Pulsed

