



## Amps Pack High Power To 1 GHz

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Tue, 2013-09-17 14:08

These rugged solid-state power amplifier systems pack cooling, control, and monitoring circuits within compact, rack-mount housings.

High power levels for testing usually imply large amounts of rack space. However, this does not hold true for a series of broadband solid-state power amplifiers from [Empower RF Systems](#). For these amplifiers, the circuitry and associated electronics—including forced-air-cooling subsystems—are contained within a single five-rack-unit (5RU) enclosure for applications requiring as much as 1 kW saturated output power through 1 GHz. Suitable for pulsed and continuous-wave (CW) high-power applications, they can be supplied for use with single-phase and three-phase AC power supplies.

Complete with control, monitoring, and protection functions in addition to its integral forced-air cooling system, model 2066-BBS3K4AUT delivers 1 kW saturated output power from 500 to 1000 MHz with at least 500 W output power at 1-dB compression and at least 63-dB gain under saturated output-power conditions. The amplifier reaches a third-order intercept point of +64 dBm or higher when tested with tone tones and 1-MHz spacing between tones. The reliable amplifier is designed to work with input power levels from -3 to +3 dBm, with an input level of 0 dBm specified for the rated saturated output power level of 1 kW. The worst-case gain flatness is  $\pm 3$  dB, and gain can be adjusted, by means of an integral voltage-variable attenuator (VVA), across a minimum 15-dB range.

The noise figure at the saturated output level is 15 dB or less. Without optional harmonic-suppression filters, second-order harmonic levels are -15 dBc or better while third-order harmonic levels are -12 dBc or better. This rugged amplifier (**see figure**) measures 17.5 x 8.75 x 22 in. and weighs 92 lbs. without the optional harmonic-suppression filters. It is supplied with Type-N female input connector and Type-7/16-DIN female output connector (with optional Type-SC female output connector available).

For broader frequency coverage, the firm also offers its model 2162 - BBS2E4AUT in a similar housing, but for applications from 20 to 1000 MHz. Ideally suited for use in electromagnetic-interference (EMI) and radio-frequency-interference (RFI) measurements, the amplifier provides 1 kW minimum saturated output power and 800 W minimum output power at 1-dB compression across the full frequency range. With 60-dB minimum gain at the saturated output-power level, the amplifier requires 0-dBm input power for saturation. It achieves gain flatness of  $\pm 3.5$  dB, with moderate noise-figure performance of 20 dB at maximum gain from 20 to 300 MHz and 15 dB at maximum gain from 300 to 1000 MHz. The amplifier, with a typical third-order intercept point (IP<sub>3</sub>) of +64 dBm, controls spurious levels to -60 dBc or less.

As with its 500-MHz counterpart, model 2066-BBS3K4AUT, the 20-to-1000-MHz model 2162-BBS2E4AUT measures just 17.5 x 8.75 x 22.0 in. and weighs 95 lbs. It includes a forced-air cooling system and uses Type-N female input connector and 7/16-DIN female output connector. It consumes 5000 W power from a single-phase supply from 180 to 260 VAC.

The amplifier includes a built-in control and monitoring system, with protection functions which preserve high availability. Remote management and diagnostics are via an embedded web server allowing network managed site status and control simply by connecting the unit's Ethernet port to a LAN. Using a web browser and the unit's IP address (IPV4, IPV6) allows ease of access with the benefit of multi-level security. The control system core supports hardware encryption, runs an embedded OS (Linux), has a built-in non-volatile memory for event recording, and sports factory setup recovery features. The extended memory option allows storage of control parameters and event logs.

These amplifiers are supplied standard for use with 180-to-260-VAC single-phase supplies, but are also available with optional three-phase AC supplies. They are intended for use within a -10 to +50°C operating ambient temperature range. Amplifiers in the product family are designed with built-in control and monitoring systems, as well as protection functions for high reliability. The amplifiers also include an Ethernet port for connection to a local area network (LAN) for remote management and diagnostics. The firm offers dedicated software to simplify remote control and diagnostics of these amplifiers over an LAN.

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**Source URL:** <http://mwrf.com/systems/amps-pack-high-power-1-ghz>