

## Solid State Broadband High Power Amplifier

2066 – BBS3K4AUT

500 – 1000 MHz / 1000 Watts

The BBS3K4AUT (SKU 2066) is suitable for octave bandwidth high power CW, modulated, and pulse applications. This amplifier utilizes high power LDMOS devices that provide wide frequency response, high gain, high peak power capability, and low distortions. Exceptional performance, long-term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, and all qualified components. The amplifier and optional switch filter bank are constructed within one single 5RU drawer including the forced air-cooling. The system comes standard to operate from 180-260VAC single phase or optionally can be ordered with a three phase AC supply.



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 factory setup recovery features. The extended memory option allows storage of control parameters and event logs.

Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state linear design
- Suitable for CW, AM, FM and pulse (Consult factory for other modulation types)
- Compact Modular design
- 50 ohm input/output impedance
- Built in Control, Monitoring and Protection functions
- High reliability and ruggedness
- Optional harmonic and spurious suppression via internal switched filter bank (quoted separately)

### ELECTRICAL SPECIFICATIONS over temperature conditions (-10 to +50°C)

| Parameter  | Symbol           | Min  | Typ | Max       | Unit |
|--|------------------|------|-----|-----------|------|
| Operating Frequency  | BW               | 500  |     | 1000      | MHz  |
| Power Output CW <sup>(Note 1)</sup>  | P <sub>SAT</sub> | 1000 |     |           | Watt |
| Power Output @ 1dB Gain Compression <sup>(Note 2)</sup>                        | P <sub>1dB</sub> | 500  |     |           | Watt |
| Power Gain @ 1dB Gain Compression  | G <sub>1dB</sub> | 63   |     |           | dB   |
| Input Power for Rated P <sub>SAT</sub>   | P <sub>IN</sub>  |      | 0   |           | dBm  |
| Input Power Range  | P <sub>IN</sub>  | -3.0 |     | +3.0      | dBm  |
| Gain Flatness / Leveled ALC  | ΔG               |      |     | ±3.0/±1.0 | dB   |
| Gain Adjustment Range  | VVA              | 15   |     |           | dB   |
| Input Return Loss  | S <sub>11</sub>  |      |     | -10       | dB   |
| Noise Figure @ maximum gain  | NF               |      |     | 15        | dB   |
| Third Order Intercept Point<br>2-Tone @ 54dBm/Tone, 1MHz Spacing               | IP3              | +64  |     |           | dBm  |
| Harmonics @ P <sub>OUT</sub> = 1000W<br>(without Harmonic Suppression Filters) | 2 <sup>nd</sup>  |      |     | -15       | dBc  |
|  | 3 <sup>rd</sup>  |      |     | -12       | dBc  |
| Spurious Signals   | Spur             |      |     | -60       | dBc  |
| Operating Voltage – (single Φ)   | V <sub>AC</sub>  | 180  | 220 | 260       | Volt |
| Operating Voltage – (3 Φ)  | V <sub>AC</sub>  |      | 208 |           | Volt |
| Power Consumption @ 1000W CW   | P <sub>D</sub>   |      |     | 5000      | Watt |

Notes:  
 1. CW measurement performed in MGC Mode (Manual Gain Control).  
 2. P<sub>1dB</sub> measurement performed with CCDF method, IS-95, 1MHz BW.

### MECHANICAL SPECIFICATIONS

| Parameter                                     | Value   | Units |
|---|---|-------|
| Dimensions W x H x D                          | 17.5 x 8.75 x 22  | Inc   |
| Weight (Without Harmonic Suppression Filters) | 92  | lb.   |
| RF Connectors Input/Output                    | Input: Type-N, Female<br>Output: Type-7/16-DIN, Female (optional Type-SC, Female) |       |
| RF Sample                                     | Type-SMA, Female  |       |
| Blanking Input                                | Type-BNC, Female  |       |
| Cooling                                       | Built in forced-air cooling system  |       |

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### ENVIRONMENTAL CHARACTERISTICS (Qualification Data available for review):

| Parameter  | Symbol           | Min | Typ | Max | Unit |
|--|------------------|-----|-----|-----|------|
| Operating Ambient Temperature  | T <sub>C</sub>   | -10 |     | +50 | °C   |
| Non-operating Temperature  | T <sub>STG</sub> | -40 |     | +85 | °C   |
| Relative Humidity (non-condensing)   | RH               |     |     | 95  | %    |
| Shock / Vibration - MIL-STD-810F<br>Shock Method 516.5, Vibration Method 514.5 | SH / VI          |     |     |     |      |

### PROTECTIONS:

| Parameter                      | Specifications  | Unit |
|--------------------------------|---|------|
| Input Overdrive                | +10 dBm   | Max  |
| VSWR Protection                | At 3:1 – PA backs off output power to a safe operating level – no system shutdown, “On Air” time is maximized | -    |
| Thermal – Graceful Degradation | Ambient 50°C  | Min  |
| Default Data Recovery          | Factory Default Calibration Recovery  |      |

### COMMUNICATION INTERFACES:

| Function                           | Utility   | Connector              |
|------------------------------------|---|------------------------|
| Ethernet                           | Network management of device / web interface        | RJ45                   |
| USB                                | Mass storage / Expansion Bus                        | USB 1.x/2.0 compatible |
| RS-232 (default) RS-422 (optional) | Serial management of device / local operator access | D-Sub 9-position Male  |

### SYSTEM I/O CONNECTOR – 14-pin

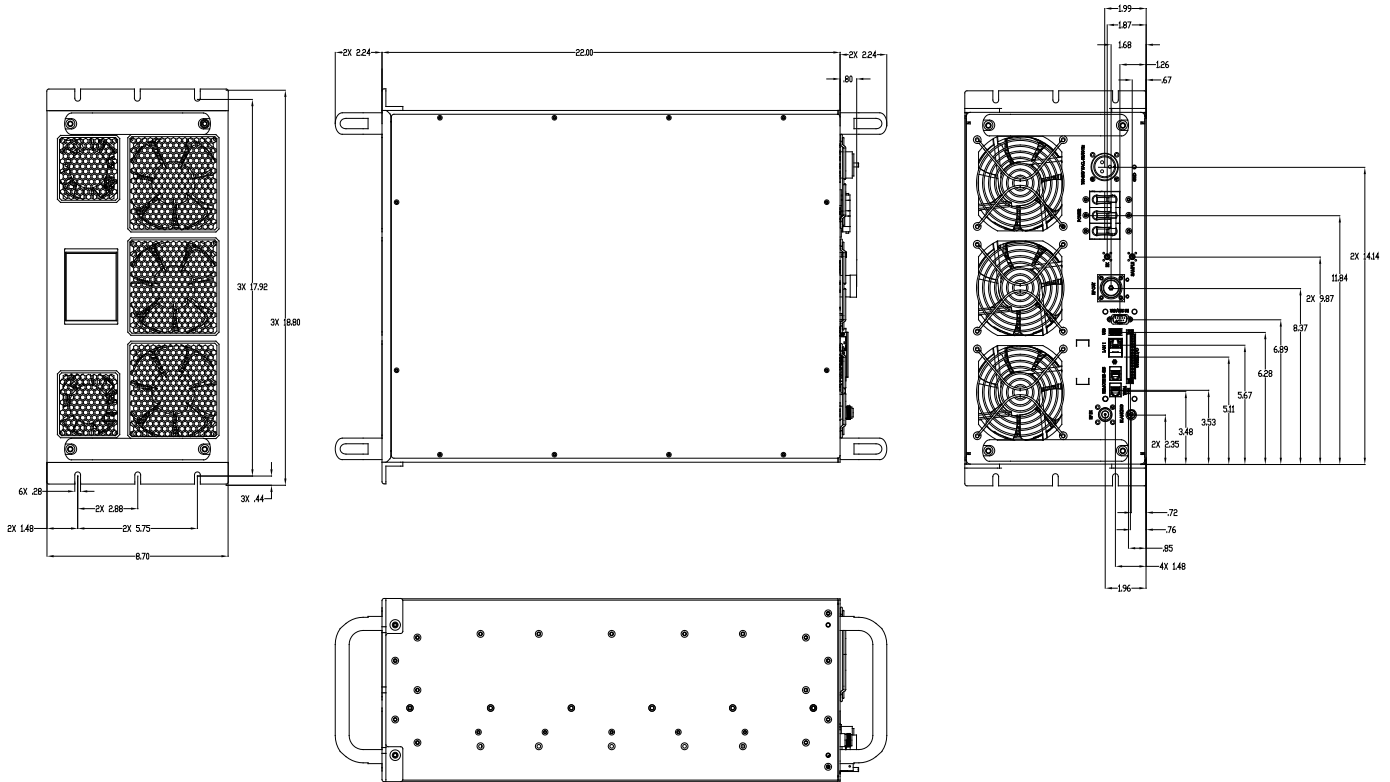
| Pin # | Description                | Specifications  |
|-------|----------------------------|---|
| 1     | FWD TP                     | Forward detected power (analog voltage: 0 – 5 Volt)   |
| 2     | REV TP                     | Reverse detected power (analog voltage: 0 – 5 Volt)   |
| 3     | Summary Fault              | Summary Fault: Active TTL Logic Low ( $\leq 0.7V$ )<br>(Internally Pulled-High)                           |
| 4     | VVA control                | Gain control/Monitor: Analog Voltage Range 0-5V<br>Gain Control: 0V= Max. Attenuator, 5V= Min. Attenuator |
| 5     | Shutdown                   | Amplifier Disable: TTL Logic Low ( $\leq 0.7V$ )<br>(Internally Pulled-High)                              |
| 6     | Aux P/S TP                 | +12.0V <sub>DC</sub> $\pm 2V$ (resettable 0.5amp fuse)  |
| 7     | Main P/S TP                | +44.0V <sub>DC</sub> $\pm 4.8V$ (resettable 0.5amp fuse)  |
| 8     | GND                        | Ground  |
| 9     | Open drain control         | Site management utility (reserved)  |
| 10    | Open drain control         | Site management utility (reserved)  |
| 11    | Open drain control         | Site management utility (reserved)  |
| 12    | Digital I/O (configurable) | Site management utility (reserved)  |
| 13    | Digital I/O (configurable) | Site management utility (reserved)  |
| 14    | GND                        | Ground  |

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## OUTLINE DRAWING



Note – Outline includes internal optional filter bank (Quoted Separately)