

## Solid State Broadband High Power Amplifier

2042 - BBS1C4AEL

1 – 1000 MHz / 25 Watts

The BBS1C4AEL (2042) is suitable for ultra broadband high power linear applications. This amplifier utilizes high power push-pull MOSFET devices that provide wide frequency response and dynamic range, high gain, low distortions, and good linearity. Employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, and all qualified components achieve exceptional performance, and high efficiency. The system includes a universal voltage, single phase, power supply and a built-in forced air-cooling system. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



SKU#: 2042CFFAAXXX

- Solid-state class AB design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Standard front panel manual gain adjust
- Suitable for CW, AM, and FM (Consult factory for other modulation type)
- 50 ohm input/output impedance
- High reliability and ruggedness

### ELECTRICAL SPECIFICATIONS @ 120V<sub>AC</sub>, 25°C, 50 Ω System

| Parameter  | Symbol           | Min | Typ | Max  | Unit |
|--|------------------|-----|-----|------|------|
| Operating Frequency  | BW               | 1   |     | 1000 | MHz  |
| Output Power CW  | P <sub>SAT</sub> | 25  | 30  |      | Watt |
| Output Power @ 1dB Gain Compression                                | P <sub>1dB</sub> | 12  | 20  |      | Watt |
| Power Gain @ 1dB Gain Compression                                  | G <sub>1dB</sub> | 44  |     |      | dB   |
| Input Power for Rated P <sub>SAT</sub>                             | P <sub>IN</sub>  |     | 0   | 3    | dBm  |
| Small Signal Gain Flatness   | ΔG               |     |     | ±1.5 | dB   |
| Gain Adjustment Range  | FGA              | 25  |     |      | dB   |
| Input Return Loss  | S <sub>11</sub>  |     |     | -10  | dB   |
| Noise Figure   | NF               |     | 10  |      | dB   |
| Third Order Intercept Point<br>2-Tone @ 33dBm/Tone, 100kHz Spacing | IP3              |     | +50 |      | dBm  |
| Harmonics @ P <sub>OUT</sub> = 12W                                 | H                |     | -20 |      | dBc  |
| Spurious Signals   | Spur             |     | -70 | -60  | dBc  |
| Operating Voltage (1-phase)  | V <sub>AC</sub>  | 100 |     | 240  | Volt |
| Power Consumption @ P <sub>OUT</sub> = 25W CW                      | P <sub>D</sub>   |     |     | 200  | Watt |

### MECHANICAL SPECIFICATIONS

| Parameter                  | Value   | Unit  |
|----------------------------|---|-------|
| Dimensions (W x H x L)     | 18.5 x 3.5 x 17.0<br>8.5 x 3.5 x 16.6 (Bench Top) | Inch  |
| Weight                     | 25  | Pound |
| RF Connectors Input/Output | Type-N, Female                                    | -     |
| Cooling                    | Built-in internal forced air cooling system       | -     |

### ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

| Parameter   | Symbol           | Min | Typ      | Max    | Unit |
|---|------------------|-----|----------|--------|------|
| Operating Ambient Temperature                                 | T <sub>A</sub>   | 0   |          | +50    | °C   |
| Non-operating Temperature                                     | T <sub>STG</sub> | -40 |          | +85    | °C   |
| Relative Humidity (non-condensing)                            | RH               |     |          | 95     | %    |
| Altitude (MIL-STD-810F Method 500.4)                          | ALT              |     |          | 30,000 | Feet |
| Vibration/Shock<br>MIL-STD-810F - Method 514.5/516.5 – Proc I | VI / SH          |     | Airborne |        | -    |

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### LIMITS

|                                     |  |     |
|-------------------------------------|--|-----|
| Input RF drive level without damage | +10  | Max |
| Load VSWR @ P <sub>OUT</sub> = 12W  | ∞ @ all load phase & amplitude for duration of 1 minute<br>3:1 @ all load phase & amplitude continuous | -   |
| Thermal Overload                    | 85 shutdown  | Max |

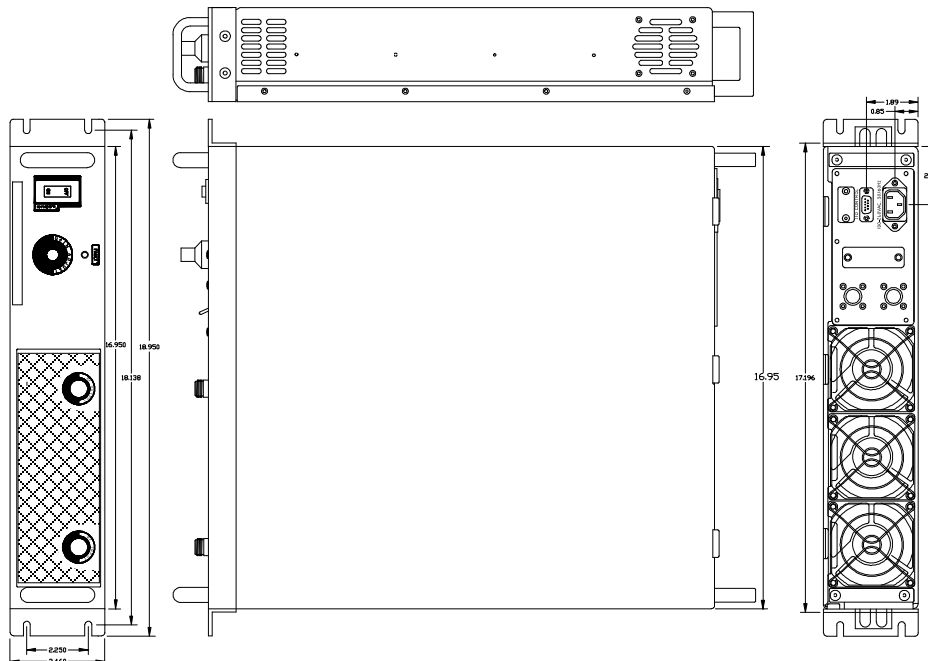
### AVAILABLE OPTIONS

| SKU Number    | Description   | LCD Touchscreen   |
|---------------|---|---|
| 2042CLFAAXLXX | LCD controller, Front RF connectors 100-240VAC, 50/60Hz.                    | Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232. <i>Note: (Output power is lowered by 0.5-0.75dB with this option)</i> |
| 2042CLRAAXXXX | LCD controller, Rear RF connectors 100-240VAC, 50/60Hz.                     |   |
| 2042CFFAAXXXX | FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz            |   |
| 2042CFRAAXLXX | FGA (Front Gain Adjust) Rear RF Connectors, 100-240VAC, 50/60Hz             |   |
| Optional      | Rack Slides (Call for price)  |   |
| 2042AFFAAXXXX | Bench Top, FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz |   |

### I/O CONNECTOR – D-Sub 9-Pin, Female

| Pin # | Description        | Specification   | Option |     |
|-------|--------------------|---|--------|-----|
|       |                    |   | FGA    | LCD |
| 1     | Forward Test Point | Analog Voltage 0-5V <sub>DC</sub> relative to Forward Power Level |        | √   |
| 2     | Reverse Test Point | Analog Voltage 0-5V <sub>DC</sub> relative to Reverse Power Level |        | √   |
| 3     | 5V Test Point      | Test point: 5.0V <sub>DC</sub> ±0.2V                              | √      | √   |
| 4     | VVA Test Point     | Test point: 5.6V <sub>DC</sub> ±0.2V                              | √      |     |
| 5     | EXT Shutdown       | Amplifier Disable: TTL Logic High (5V)<br>(Internally Pulled-Low) | √      | √   |
| 6     | 12V Test Point     | Test point: 12.0V <sub>DC</sub> ± 0.5V                            | √      | √   |
| 7     | P/S Test Point     | Test point: 26.0-30.0V <sub>DC</sub>                              | √      | √   |
| 8&9   | GND                | Ground  | √      | √   |

### SYSTEM OUTLINE SHOWN SKU#: 2042CFFAAXXXX



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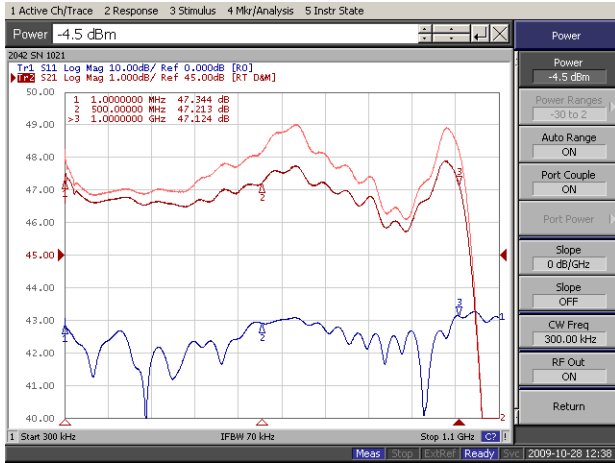
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## TYPICAL PERFORMANCE PLOTS

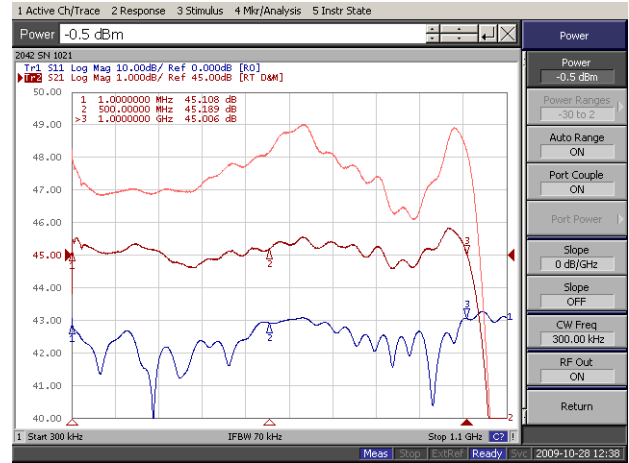
### Plot 1 – Small Signal Gain and $P_{1dB}$

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -4.5dBm$   
 Reference: 45dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



### Plot 2 – Small Signal Gain and $P_{SAT}$

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve:  $P_{SAT}$  @  $P_{IN} = -0.5dBm$   
 Reference: 45dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



### Plot 3 – Gain Adjustment Range

Top Curve: Maximum Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Minimum Gain @  $P_{IN} = -20dBm$   
 Reference: 20dB, 10dB/div.  
 Bottom Curve: Input Return Loss @ Minimum Gain  
 Reference: 0dB, 10dB/div.

