

Solid State Broadband High Power Amplifier

2012 – BBS0D3FEL

0.15 – 230 MHz / 25 Watts

The BBS0D3FEL (2012) is suitable for ultra broadband high power linear applications. Suitable for laboratory, immunity testing and general applications, these amplifiers are utilizing push-pull MOSFET power devices that provide high gain, wide dynamic range, low distortions, and good linearity. Exceptional performance, long term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, machined housings and qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



SKU#: 2012CFFAAXXX

- Solid-state Class AB design
- Instantaneous ultra broadband
- Small form factor and lightweight, Bench top or Rack mount
- Front panel manual gain adjust or LCD controller
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ 120V_{AC}, 25°C, 50 Ω System

| Parameter | Symbol | Min | Typ | Max | Unit |
|--|------------------|------|-----|------|------|
| Operating Frequency | BW | 0.15 | | 230 | MHz |
| Output Power CW | P _{SAT} | 25 | | | Watt |
| Output Power @ 1dB Gain Compression | P _{1dB} | 15 | | | Watt |
| Input Power @ Rated P _{SAT} | P _{IN} | | 0 | 3 | dBm |
| Power Gain @ 1dB Gain Compression | G _{1dB} | 44 | | | dB |
| Small Signal Gain Flatness | ΔG | | | ±1.5 | dB |
| Gain Adjustment Range | FGA | 20 | 25 | | dB |
| Input Return Loss | S ₁₁ | | | -10 | dB |
| Noise Figure | NF | | 10 | | dB |
| Third Order Intercept Point 2-Tone @ 33dBm/Tone, 100kHz Spacing | IP3 | | +52 | | dBm |
| Harmonics @ P _{OUT} = 15W | H | | -20 | | dBc |
| Spurious Signals | Spur | | | -60 | dBc |
| Operating Voltage (1-phase) | V _{AC} | 100 | | 240 | Volt |
| Power Consumption @ P _{OUT} = 25W CW | P _D | | | 250 | Watt |

MECHANICAL SPECIFICATIONS

| Parameter | Value | Unit |
|----------------------------|---|-------|
| Dimensions | 18.5 x 3.5 x 17 | 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 _A | 0 | | +50 | °C |
| Non-operating Temperature | T _{STG} | -40 | | +85 | °C |
| Relative Humidity without Condensation | RH | | | 95 | % |
| Altitude (MIL-STD-810F Method 500.4) | ALT | | | 30,000 | Feet |
| Vibration / Shock MIL-STD-810F - Method 514.5/516.5 – Proc I | VI / SH | | Airborne | | |

LIMITS

| | | |
|-------------------------------------|--|-----|
| Input RF drive level without damage | +10dBm | Max |
| Load VSWR @ P _{OUT} = 15W | ∞ @ all load phase & magnitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous | - |
| Thermal Overload | 85° shutdown | Max |

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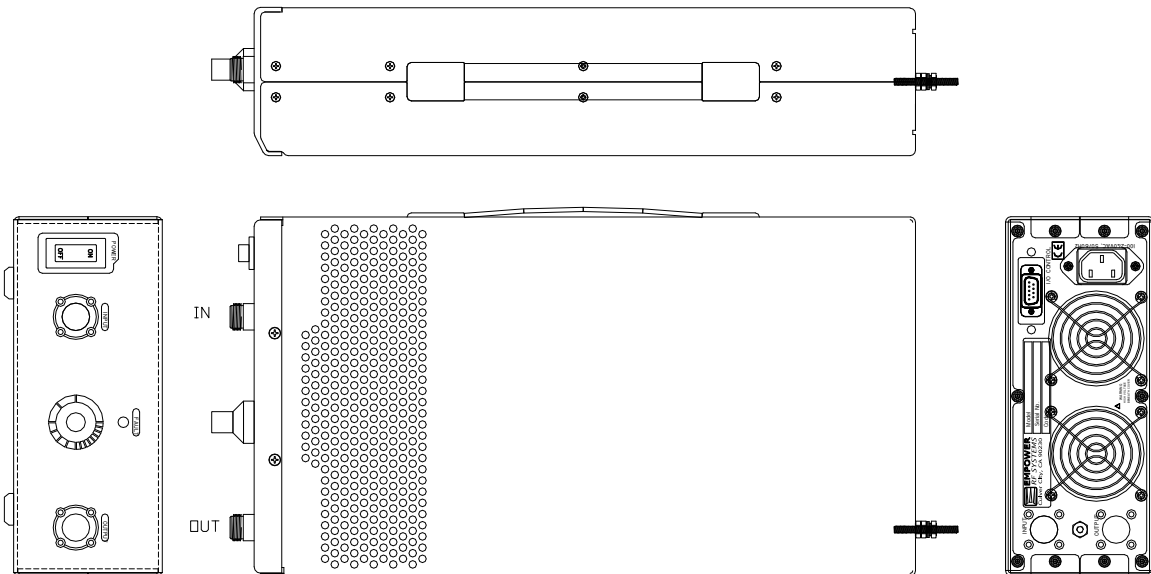
AVAILABLE OPTIONS

| SKU # | Description | LCD Touchscreen |
|---------------|---|---|
| 2012CLFAAXLXX | 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> |
| 2012CFFAAXXXX | FGA (Front Gain Adjust), Front RF connectors, 100-240VAC, 50/60Hz | |
| 2012CFRAAXLXX | FGA (Front Gain Adjust), Rear RF connectors, 100-240VAC, 50/60Hz | |
| Optional | Rack Slides (Call for price) | |
| 2012AFFAAXXXX | Bench Top, FGA (Front Gain Adjust) Front RF connectors, 100-240VAC, 50/60Hz | |
| 2012AFRAAXXXX | Bench Top, FGA (Front Gain Adjust) Rear RF connectors, 100-240VAC, 50/60Hz | |

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

| Pin # | Description | Specification | Option | | |
|-------|--------------------|---|-----------|-----|-----|
| | | | Bench Top | FGA | LCD |
| 1 | Forward Test Point | Analog Voltage 0-5V _{DC} relative to Forward Power Level | | | √ |
| 2 | Reverse Test Point | Analog Voltage 0-5V _{DC} relative to Reverse Power Level | | | √ |
| 3 | 5V Test Point | Output +5.0V _{DC} ±0.2V | √ | √ | √ |
| 4 | VVA Test Point | VVA Gain Control +5.6V _{DC} ±0.2V | √ | √ | |
| 5 | EXT Shutdown | Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low) | √ | √ | √ |
| 6 | 12V Test Point | Output +12.0V _{DC} ± 0.5V | √ | √ | √ |
| 7 | P/S Test Point | Power Supply Output voltage: +26.0-30.0V _{DC} | √ | √ | √ |
| 8&9 | GND | Ground | √ | √ | √ |

OUTLINE DRAWING – Bench Top Shown
SKU#: 2012AFFAAXXXX

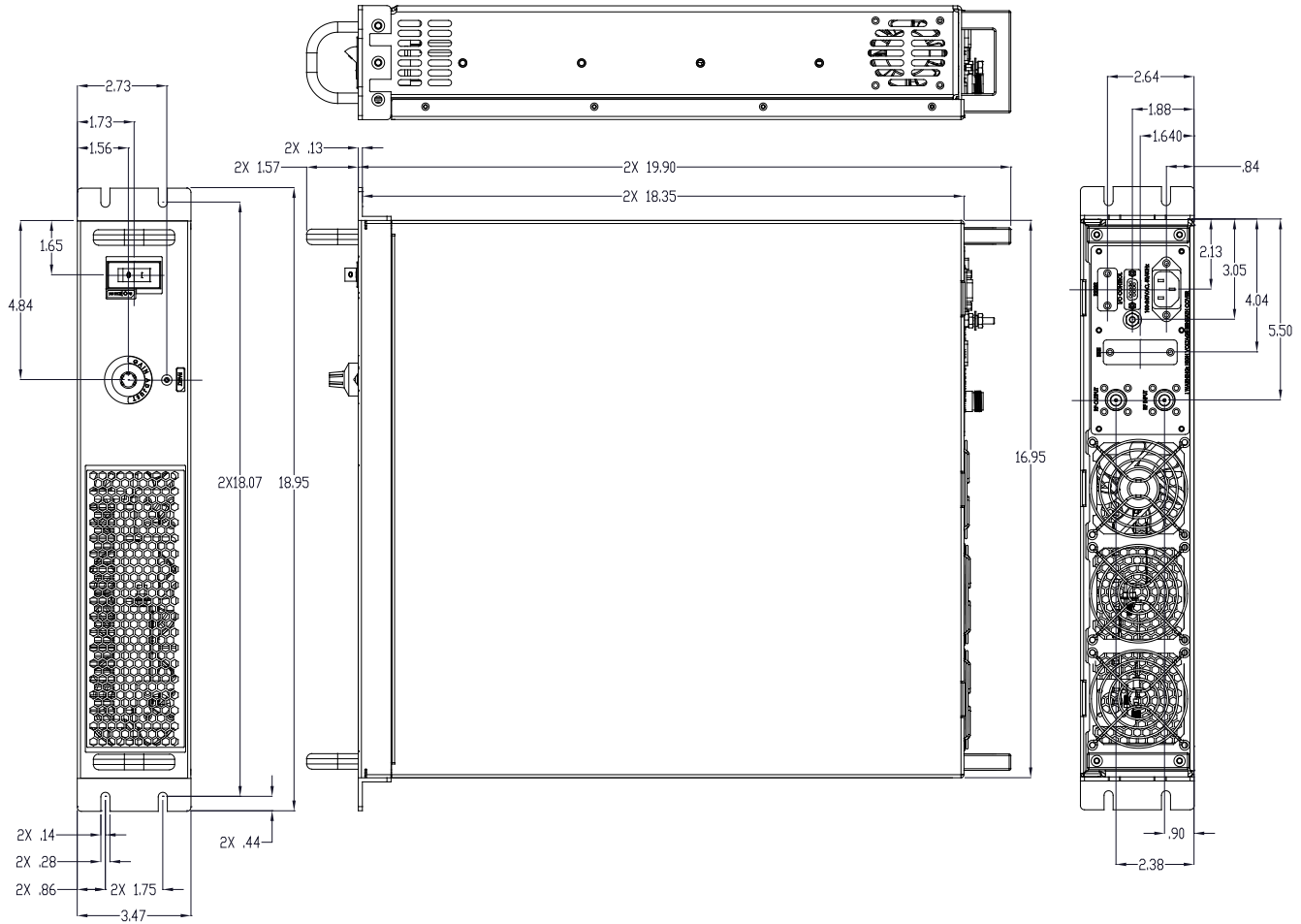


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SYSTEM OUTLINE Shown
SKU#: 2012CFRAAXXX



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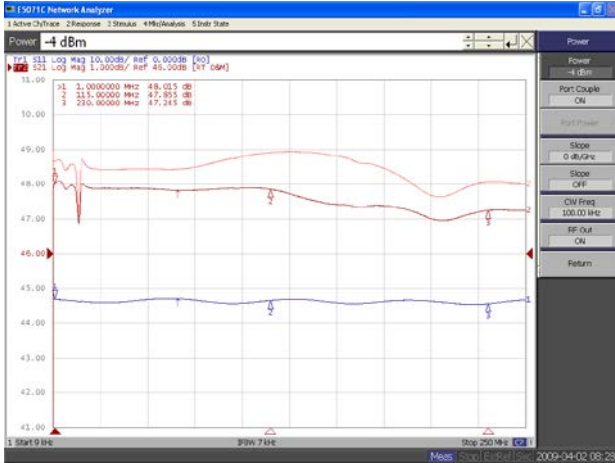
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TYPICAL PERFORMANCE PLOTS

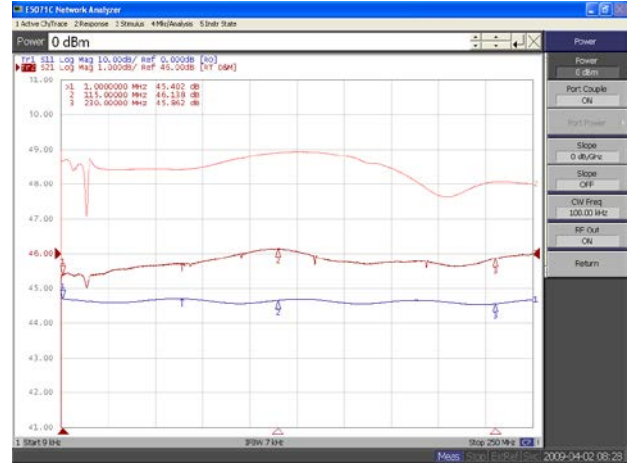
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -4.0dBm$
 Reference: 46dB, 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: Power Gain @ P_{SAT} , $P_{IN} = 0.0dBm$
 Reference: 46dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range

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

