EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2095 - BBS0D3FUT

0.15 – 230 MHz / 1000 Watts

The BBS0D3FUT (SKU 2095) is suitable for EMI/RFI testing, laboratory and ultra broadband high power linear applications. This amplifier utilizes high power push-pull MOSFET devices that provide high gain, wide dynamic range and good linearity. Exceptional performance, long-term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, built-in high quality power supply, EMI/RFI filters, machined housings and all qualified components. The amplifier is constructed of modular replaceable drawers and is housed in a modern rack cabinet. Each LRU includes a universal voltage, single phase, power supply and a built in forced air-cooling system. The system is provided with a combine/controller drawer and is available with an optional color LCD for local and remote interface. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state linear design
- Instantaneous ultra broadband
- Three drawers modular design
- Standard front panel manual gain adjust
- Built-in control, monitoring & protection circuits
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ $208V_{AC}$, 3-Phase, 25°C, 50Ω System

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	0.15		230	MHz
Power Output CW	P_{SAT}	1000	1200		Watt
Power Output @ 1dB Gain Compression	P_{1dB}	650	800		Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	60			dB
Input Power for Rated P_{SAT}	P_{IN}		0		dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	VVA	25	30		dB
Input Return Loss	S_{11}			-10	dB
Noise Figure @ maximum gain	NF		10		dB
Harmonics @ P_{OUT} = 650W	2^{ND} / 3^{RD}		-30 / -20		dBc
Third Order Intercept Point 2-Tone @ 50dBm/Tone, 100kHz Spacing	IP3		+64		dBm
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage, 3-phase Delta Connection (Line to Line)	V_{AC}	180		264	Volt
Power Consumption @ P_{OUT} = 1000W	P_D			6250	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions W x H x D/ Weight with enclosure	21.8" x 33.6" x 30.8" / 400	lb.	Max
Dimensions W x H x D / Weight w/o enclosure	19"x26.25"x22" / 300	lb.	Typ
RF Connectors Input / Output	Type-N, Female		
Cooling	Built-in forced-air cooling system		

ENVIRONMENTAL SPECIFICATIONS (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 (non-condensing)	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		

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LIMITS

Input RF drive level without damage	+6 dBm	Max
Load VSWR @ P_{OUT} = 650W	5:1 @ any angle & magnitude	Max
Thermal Overload	85°C shutdown	Max

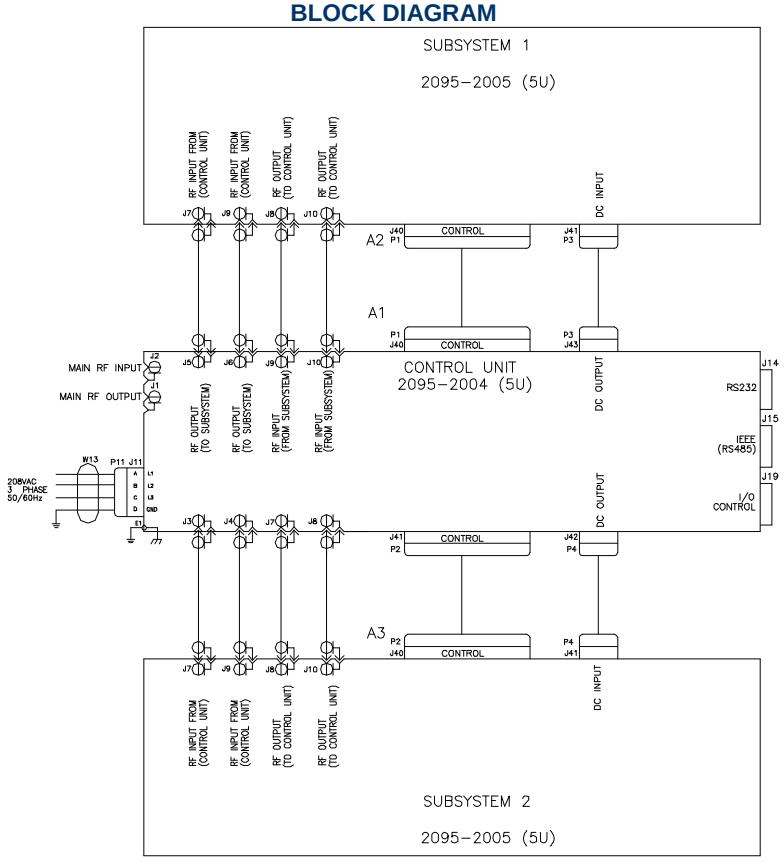
SELECTED AVAILABLE OPTIONS (Refer to www.empowerrf.com for complete options listing)

Option	Number	Description	Price
FGA	**061**	Front panel 10 turns manual gain adjustment.	Standard
FCN	**051**	Front Panel Type-N, Female Input / Output Connectors	
ACC	**033**	208V_{AC} Line to Line, 3-Phase, Delta connection	

I/O INTERFACE CONNECTOR – D-sub 9-pin, Female

Pin #	Description	Specifications	Option: FGA
1	N/C	No Connection	
2	N/C	No Connection	
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	PS1 Test Point	P/S1 Output voltage: +26.0-30.0V_{DC}	√
7	P/S2 Test Point	P/S2 Output voltage: +26.0-30.0V_{DC}	√
8	N/C	No Connection	
9	GND	Ground	√

BLOCK DIAGRAM



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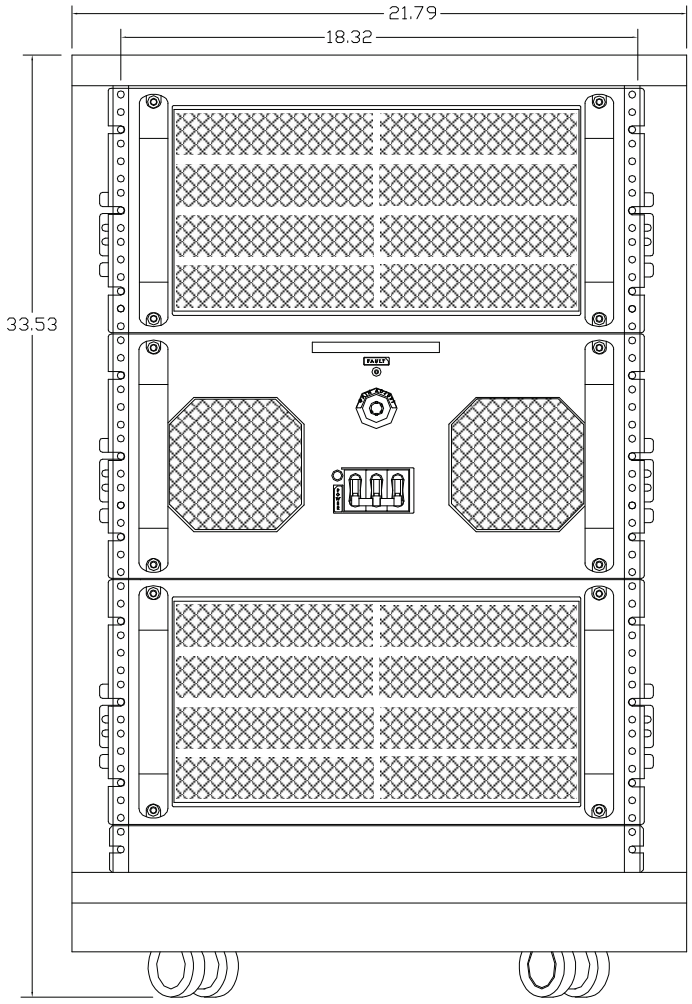
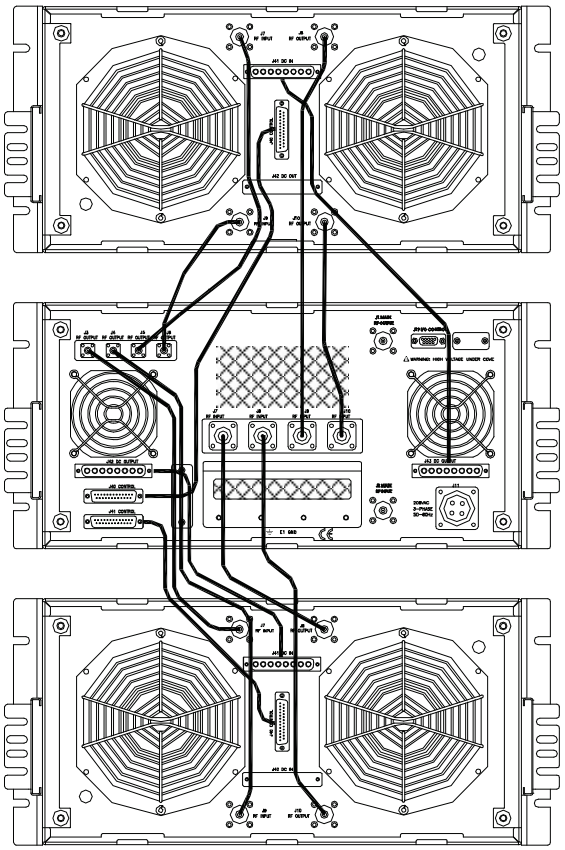
OUTLINE DRAWING - FRONT VIEW

FRONT VIEW



REAR VIEW



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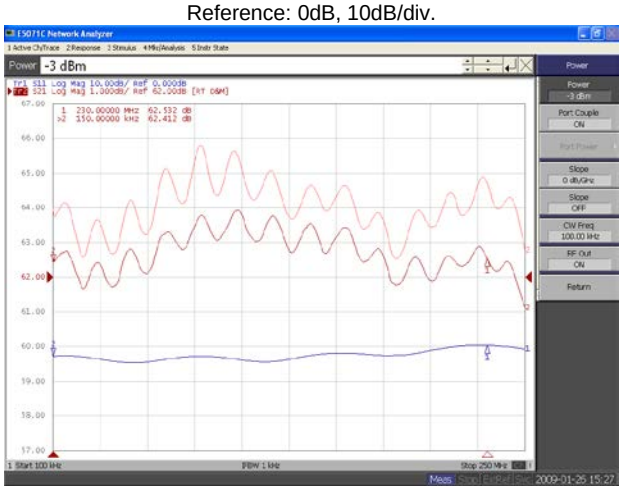
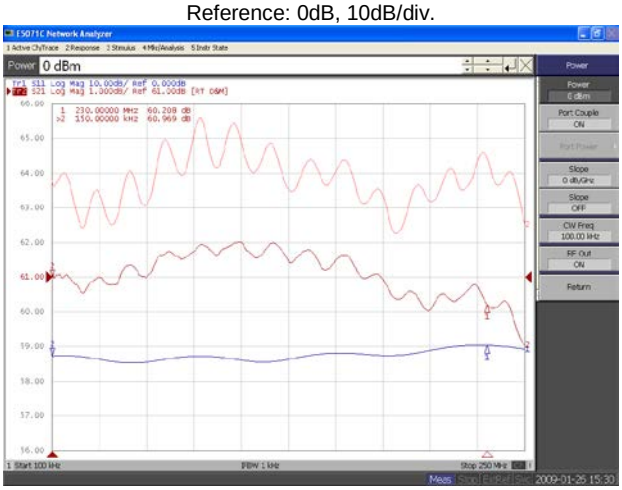
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -3.0dBm
Reference: 62dB, 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: 61dB, 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: 10dB, 10dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.