EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2041 - BBS4A5ANP

1000 – 2000 MHz / 200 Watts

The BBS4A5ANP (2041) is suitable full octave L-Band broadband high power linear applications. This rack mount amplifier utilizes advanced GaAsFET power devices that provide high gain, wide dynamic range, low distortions and excellent 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. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

SKU#: 2041FFRBAXXXX

- Solid-state class A linear design
- Instantaneous octave bandwidth
- Standard front panel manual gain adjust
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built in protection and monitoring circuits

ELECTRICAL SPECIFICATIONS @ $220V_{AC}$, 25°C, 50Ω system

Parameter	Symbol	Min	Typ	Max	Unit
Frequency Response	BW	1000		2000	MHz
Output Power CW	P_{SAT}	200			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	160			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	52			dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	FGA	25			dB
Input Return Loss	S_{11}			-10	dB
Noise Figure @ maximum gain	NF		7	10	dB
Harmonics @ P_{OUT} = 160W	H		-20		dBc
Third Order Intercept Point 2-Tone @ 43dBm/Tone, 100kHz Spacing	IP3		+63		dBm
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		260	Volt
Power Consumption @ P_{OUT} = 200W CW	P_D		1200	1500	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions W x H x D	19 x 8.75 x 22	Inch
Weight	80	Pound
RF Connectors Input / Output	Type-N, Female	
Cooling	Built-in internal forced-air cooling system	

ENVIRONMENTAL SPECIFICATIONS (Designed 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	+10 dBm	Max
Load VSWR @ P_{OUT} = 160W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude	-
Thermal Overload	85°C shutdown	Max

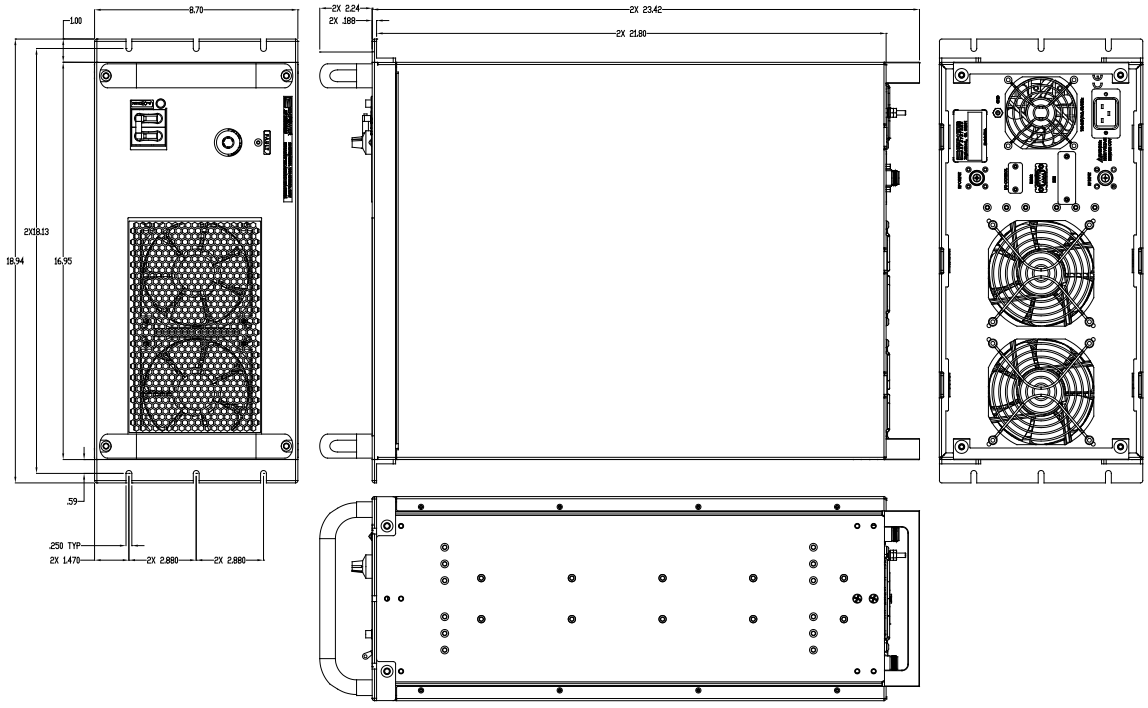
AVAILABLE OPTIONS

SKU Number	Description
2041FFFBCXLXX	FGA (Front Gain Adjust) Front RF Connectors, 180-260VAC, 50/60Hz, circular AC connector
2041FFRBAXXXX	FGA (Front Gain Adjust) Rear RF Connectors, 180-260VAC, 50/60Hz, IEC AC connector
Optional	Rack Slides (Call for price)

I/O CONNECTOR – D-sub 9-pin, Female

Pin #	Description	Specification	Option FGA	Option 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	Test point: 5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	Test point: 5.6V_{DC} ±0.5V	√	
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-low*)	√	√
6	12V Test Point	Test point: 12.0V_{DC} ±0.5V	√	√
7	P/S Test Point	Test point: 12.0-15.0V_{DC}	√	√
8&9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN
***SKU#:* 2041FFRBAXXXX**



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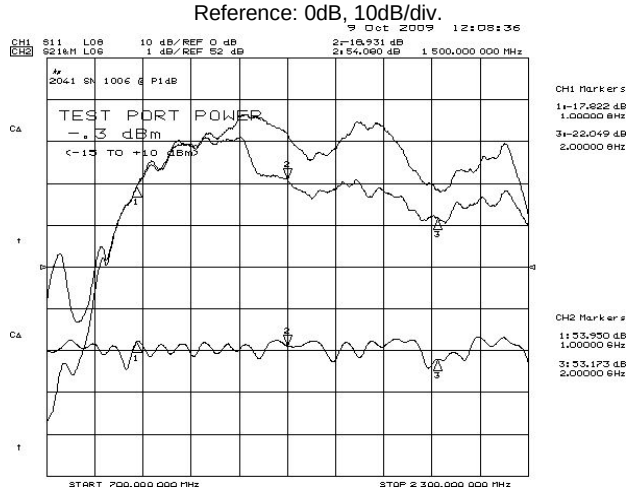
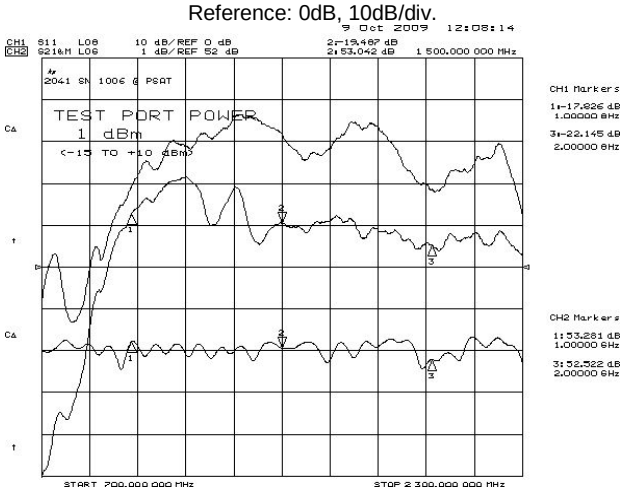
TYPICAL PERFORMANCE PLOTS

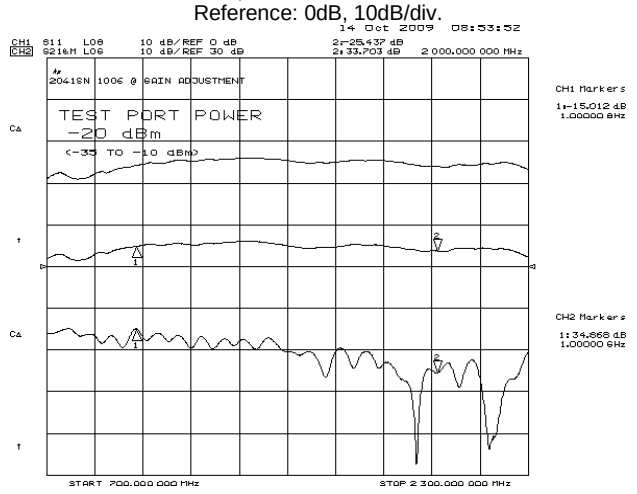
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -0.3dBm
Reference: 52dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = +1dBm
Reference: 52dB, 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: 30dB, 10dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.



Plot 4 – ALC Flatness @ 50dBm & 43dBm
Top Curve: ALC @ 50dBm, P_{IN} = 0dBm
Middle Curve: ALC @ 43dBm, P_{IN} = 0dBm
Reference: 43dB, 2dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.