EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1021-BBM1C4AHA	1 – 1000 MHz / 50 Watts

The BBM1C4AHA (SKU 1021) is suitable for ultra broadband high power linear applications. This amplifier module utilizes high power MOSFET push-pull 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. The amplifier has a built in control, monitoring and protection functions. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state Class A linear design
- Instantaneous ultra broadband
- Small and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation type)
- 50 ohm input/output impedance
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ $28V_{DC}$, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1		1000	MHz
Power Output CW	P_{SAT}	50	100		Watt
Power Output @ 1dB Gain Compression	P_{1dB}	30	50		Watt
Power Gain @ 1dB Gain Compression	G_{1dB}		20		dB
Input Power for Rated P_{SAT}	P_{IN}		30		dBm
Small Signal Gain Flatness	ΔG		±1.5	±2.0	dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tone @ 37dBm/Tone, 100kHz Spacing	IP3		+54		dBm
Harmonics @ P_{OUT} = 30W	H		-25		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DC}	26	28	30	Volt
Current Consumption @ P_{OUT} = 50W	I_{DD}		20		Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	7.6 x 7.2 x 1.2	Inch
Weight	4.0	Pound
RF Connectors Input / Output	Type-SMA, Female	
DC Interface Connector	Hybrid, D-Sub, 7-Pin, Male	
Cooling	External Heatsink (not supplied)	

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	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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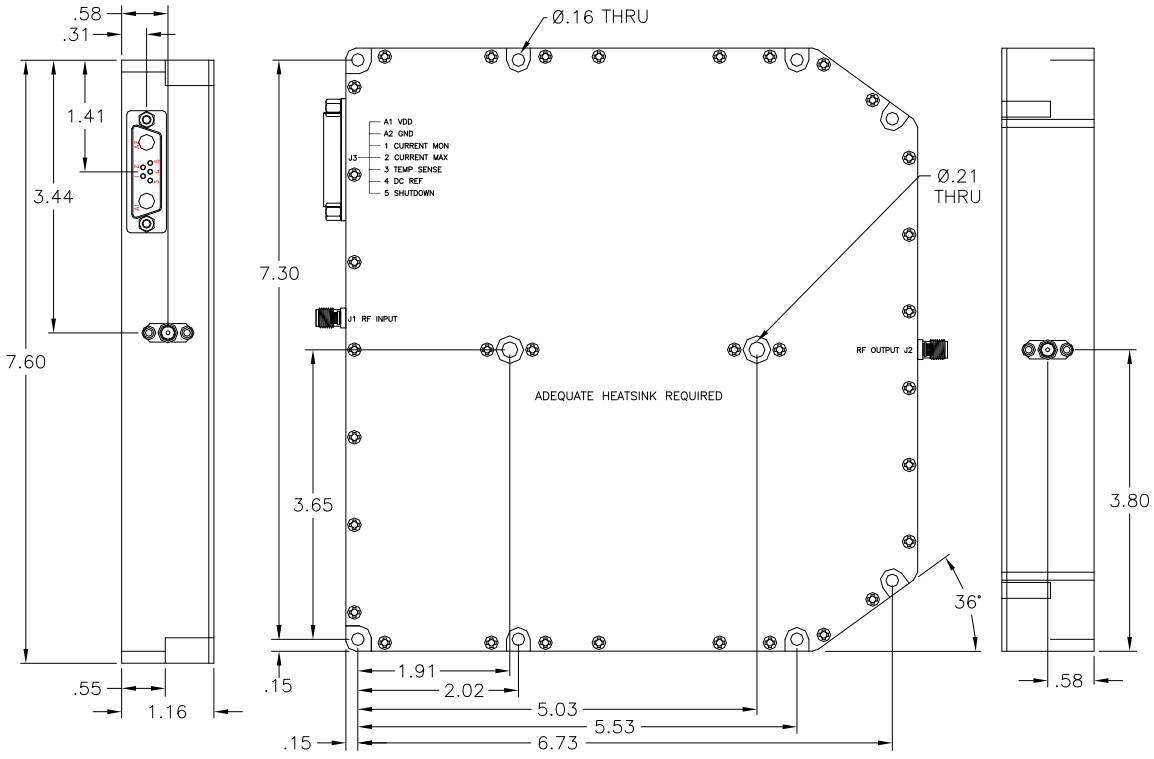
LIMITS

Input RF drive level without damage	+35dBm	Max
Load VSWR @ P_{OUT} = 50W	5:1 @ all load phase & amplitude	-
Thermal Overload	85°C shutdown	Max

DC INTERFACE CONNECTOR – Hybrid, D-Sub 7-Pin, Male

Pin #	Description	Specification
A1	VDD	26.0-30.0V_{DC}
A2	GND	Ground
1	Current Monitor	Analog voltage relative to module's current @ 10mV/100mA
2	Current Max	Factory use only (2.5V_{DC})
3	Temp Sense	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	DC REF	Factory use only (7.5V_{DC})
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-low*)

OUTLINE DRAWING



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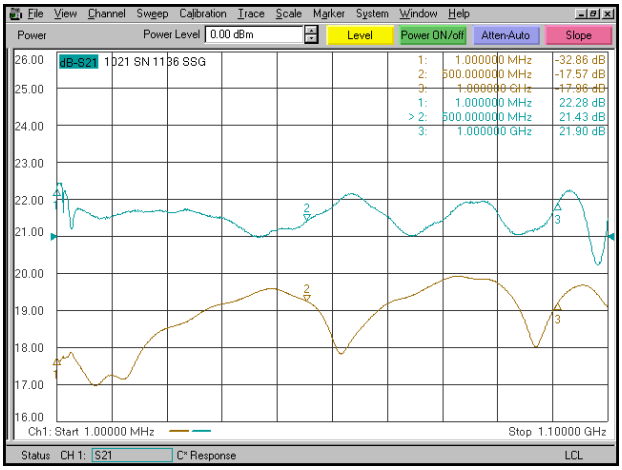
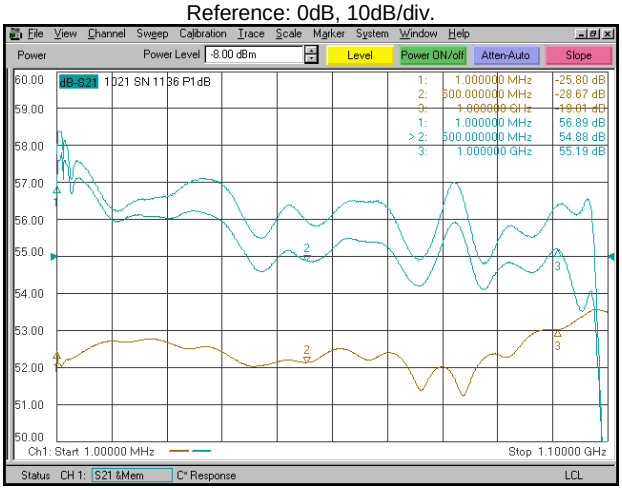
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain
Top Curve: Small Signal Gain @ P_{IN} = 0dBm
Reference: 21dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{1dB} with Driver
Top Curve: Small signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -8.0dBm
Reference: 55dB, 1dB/div.
Bottom Curve: Input Return Loss of Driver
Reference: 0dB, 10dB/div.



Plot 3 – Small Signal Gain and P_{SAT} with Driver
Top Curve: Small signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = -4.0dBm
Reference: 55dB, 1dB/div.
Bottom Curve: Input Return Loss of Driver
Reference: 0dB, 10dB/div.