EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1100 – 003

20 – 1000 MHz, 80 Watts

The SKU 1100-003 is suitable for ultra-broadband or band specific high power applications. This amplifier utilizes silicon LDMOS power devices that provide high gain, wide dynamic range, low distortion 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.

- Solid-state Class AB design
- Extremely wide instantaneous bandwidth
- Compact and lightweight
- Built-in control, monitoring and protection circuits
- Suitable for CW, AM and FM (Consult factory for other modulation types)
- 50 ohm input and output impedance
- Highly rugged and reliable

ELECTRICAL SPECIFICATIONS @ +28.0V_{DC}, 25 °C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	20		1000	MHz
Output Power CW	P_{SAT}	80			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	25			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	49	52	55	dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	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 @ Max Gain	NF			10	dB
Third Order Intercept Point 2-Tone @ 43dBm/Tone, 1MHz Spacing	IP3		53		dBm
Harmonics @ P_{OUT} = 50W	2^{nd} / 3^{rd}		-40 / -20		dBc
Spurious Signals	Spur			-60	dBc
Operating Voltage	V_{DC}	26	28	30	Volt
Current Consumption @ P_{OUT} = 80W	I_{DD}			10	Amp
Quiescent Current	I_{DQ}		6.2	6.5	Amp
Switching Time (10% to 90%)	T_{SW}		2	5	µs

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimension	6.4 x 3.4 x 1.1	Inch
Weight	1.0	Pound
RF Connectors Input/Output	Type-SMA, Female	
DC Interface Connector	D-Sub 9-Pin, Male	
Cooling	External Heatsink (Not Supplied)	

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	-40		+85	°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		

EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1100 – 003	20 – 1000 MHz, 80 Watts

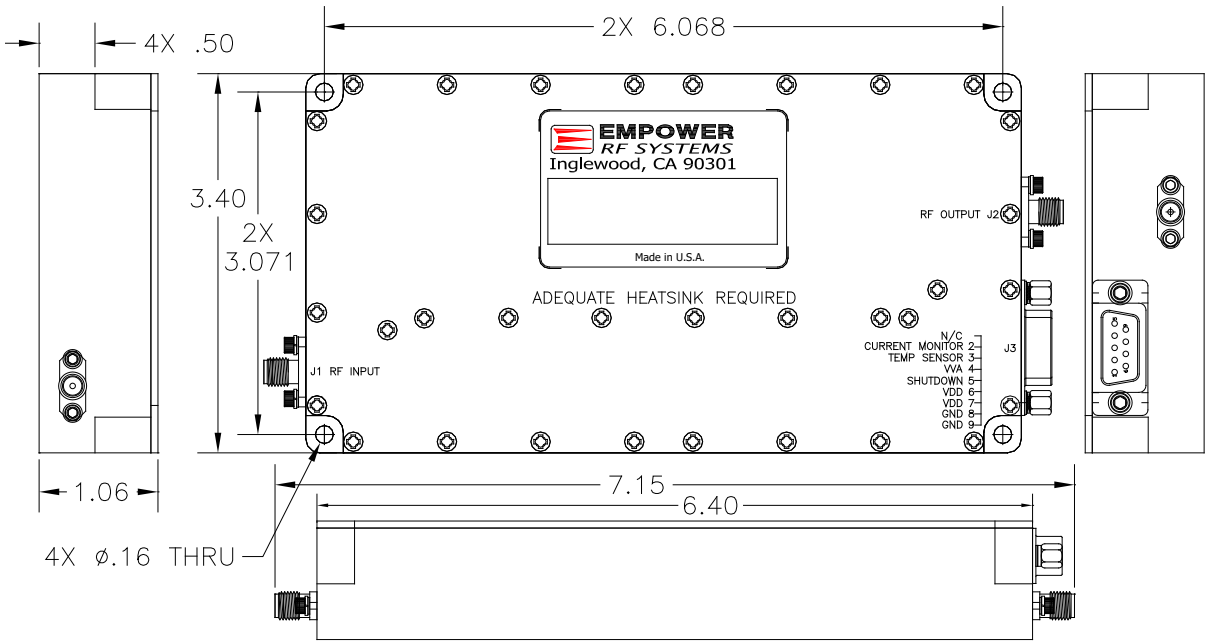
LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 80W	∞ @ any angle & amplitude for duration of 1 minute 3:1 @ any angle & amplitude continuous	-
Thermal Overload	Graceful degradation	-

DC INTERFACE CONNECTOR – D-Sub 9-Pin, Male

Pin #	Description	Specification
1	N/C	No Connection
2	Current Monitor	Analog voltage relative to I_{DD} @ 50mV/100mA
3	Temp Sensor	Analog voltage relative to module's temperature @ 10mV/°C
4	VVA	Control voltage range, 0-5V_{DC} Maximum Gain: 0V_{DC}, Minimum Gain: 5V_{DC}
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)
6&7	VDD	+26.0-30.0V_{DC}
8&9	GND	Ground

OUTLINE DRAWING



Features:

a. Fast-switching Shutdown function
b. Reverse polarity protection
c. Over-temperature protection
d. Temperature indication
e. High-temp graceful degradation
f. Current limit protection
g. Current consumption indication

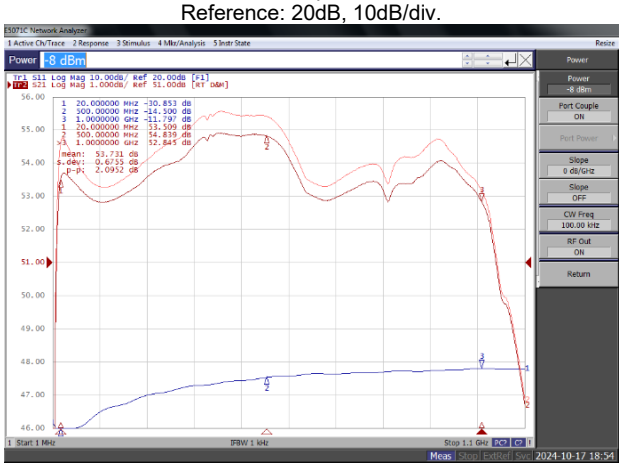
EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

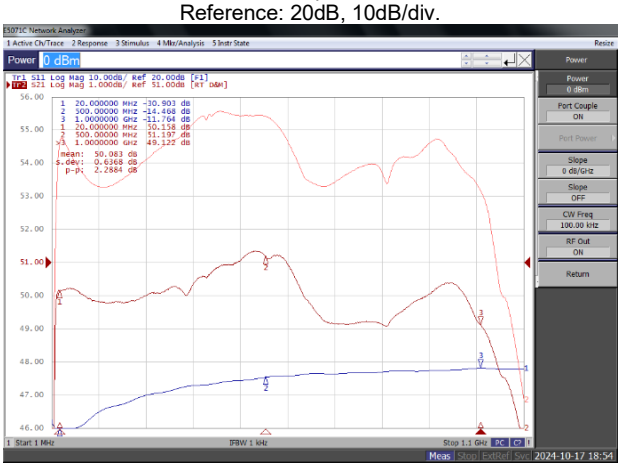
1100 – 003 | 20 – 1000 MHz, 80 Watts

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} = -8dBm
Reference: 51dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 20dB, 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} = 0dBm
Reference: 51dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div.



Plots 3 – Gain Adjustment Range @ P_{IN} = -20dBm
Top Curve: Max. Gain @ VVA_{CTRL} = 0V
Middle Curve: Min. Gain @ VVA_{CTRL} = 5V
Reference: 30dB, 10dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 20dB, 10dB/div.