EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2057 - BBS3Q5KCK

800 – 2500 MHz / 15 Watts

The BBS3Q5KCK (2057) is suitable for RF/Microwave broadband power applications. This amplifier utilizes GaAsFET power devices that provide wide frequency response and dynamic range, high gain, 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, EMI/RFI filters, and all qualified components. The system includes a universal voltage, single phase PFC power supply and a built-in forced air-cooling system. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

SKU#: 2057CFFAAXXXX

- Solid-state Class A design
- Instantaneous ultra broadband
- Small form factor and lightweight
- 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

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	800		2500	MHz
Output Power CW	P_{SAT}	15			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	12			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	42			dB
Input Power for Rated P_{SAT}	P_{IN}		0		dBm
Small Signal Gain Flatness. P_{IN} = -20dBm	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 @ 32dBm/Tone, 100kHz Spacing	IP3		+52		dBm
Harmonics @ P_{OUT} = 12W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption @ 15W CW	P_D			100	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions – Bench Top / Rack Mount	8.5 x 3.5 x 16 / 19 x 3.5 x 18	Inch
Weight	15 / 30	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 (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 without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 12W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

AVAILABLE OPTIONS

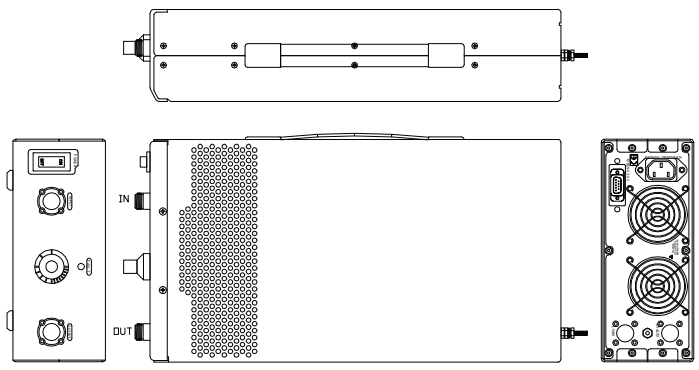
SKU #	Description	LCD Touchscreen
2057CFFAAXXXX	FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	
2057AFFAAXXXX	Bench Top, FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	

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

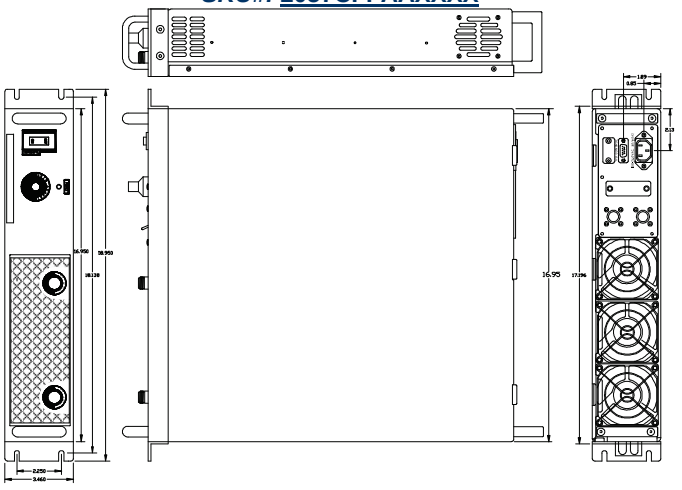
Pin #	Description	Specification	Option	
			Bench Top	Rack mount
1	N/C	No Connection		
2	N/C	No Connection		
3	5V TP	Test point: 5.0V_{DC} ±0.2V		√
4	VVA TP	Test point: 5.6V_{DC} ±0.2	√	√
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)	√	√
6	12V TP	Test point: 12.0V_{DC} ±0.5V	√	√
7	P/S TP	Test point: 12.0-15.0V_{DC}	√	√
8&9	GND	Ground	√	√

SYSTEM OUTLINES

BENCH TOP
***SKU#:* 2057AFFAAXXXX**



RACK MOUNT
***SKU#:* 2057CFFAAXXXX**



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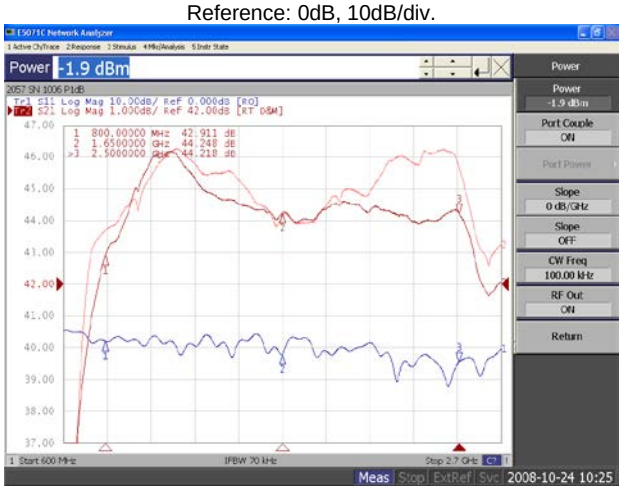
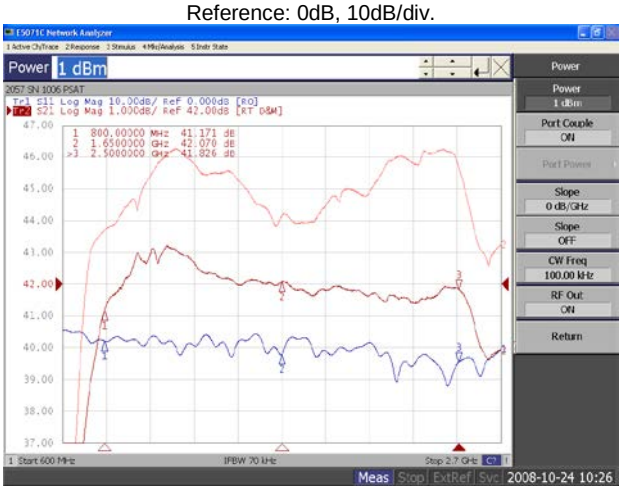
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -1.9dBm
Reference: 42dB, 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} = 1.0dBm
Reference: 42dB, 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: 20dB, 10dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.