EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2037 - BBS3C3KPQ

100 – 500 MHz / 300 Watts

The BBS3C3KPQ (2037) is suitable for broadband VHF & UHF high power applications. This rack mount amplifier is utilizing advanced Push-Pull MOSFET and LDMOS devices technology combination that provides 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, 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#: 2037DERAAXLXX

- Solid-state class AB design
- Instantaneous ultra broadband
- Small and lightweight
- 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

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	100		500	MHz
Output Power CW	P_{SAT}	300			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	240			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	54			dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	FGA	20	25		dB
Input Return Loss	S_{11}			-10	dB
Noise Figure @ max gain	NF		10		dB
Third Order Intercept Point 2-Tone, 44 dBm/Tone, 100kHz Spacing	IP3		+63		dBm
Harmonics @ P_{OUT} = 240W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption @ P_{OUT} = 300W CW	P_D			1500	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions	19 x 5.25 x 22	Inch
Weight	55	lb.
RF Connectors Input/Output	Type-N, Female	
Cooling	Built-in internal forced air cooling system	

ENVIRONMENTAL CHARACTERISTICS (Design o 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				%
Altitude (MIL-STD-810F Method 500.4)	ALT			30,000	Feet
Vibration/Shock MIL-STD-810F – Method 514.5/516.5 – Proc 1	VI / SH		Airborne		

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LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 240W	5:1 @ any angle & magnitude	-
Thermal Overload	85°C shutdown	Max

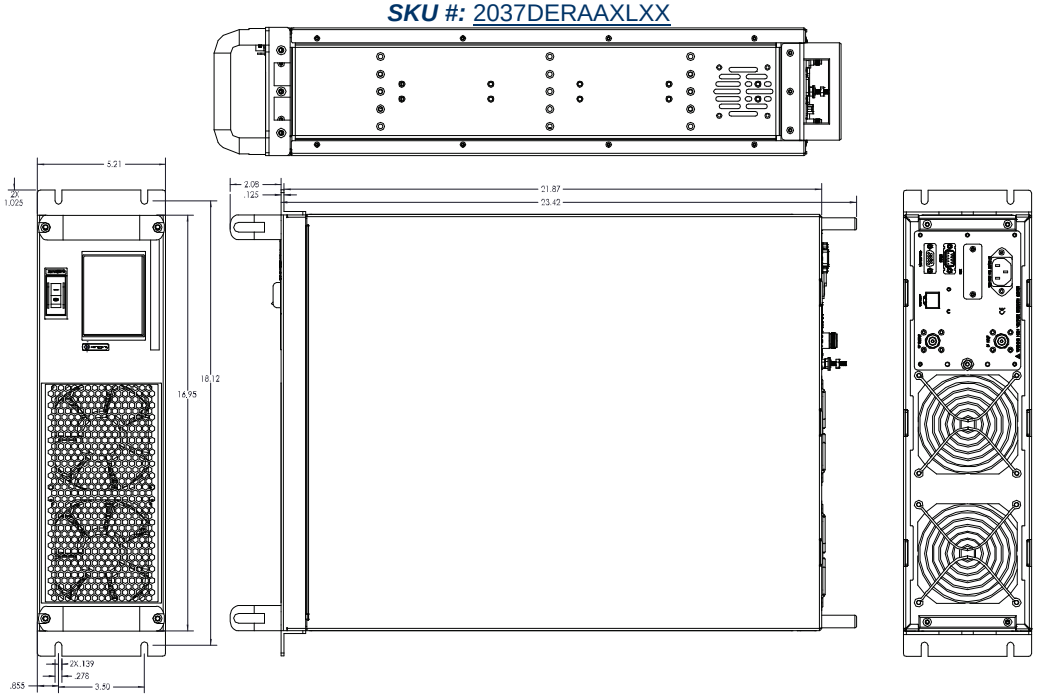
AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
2037DLRAAXLXX	LCD controller, Rear RF connectors 100-240VAC, 50/60Hz.	Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232. (***Ethernet equipped – no GPIB***)
2037DERAAXLXX	LCD controller, Ethernet, Rear RF connectors 100-240VAC, 50/60Hz.	
2037DFRAAXLXX	FGA (Front Gain Adjust) Rear RF Connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	

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

Pin #	Description	Specifications	Options FGA	Options 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	+5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	+5.6V_{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5 V) (*Internally Pulled-Low*)	√	√
6	12V Test Point	+12.0V_{DC} ± 0.5V	√	√
7	P/S Test Point	+26.0-30.0V_{DC}	√	√
8	N/C	No Connection		
9	GND	Ground	√	√

OUTLINE DRAWING SHOWN
SKU #: 2037DERAAXLXX



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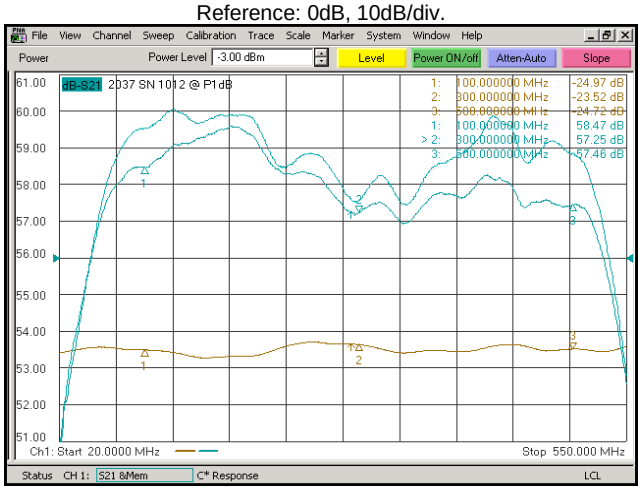
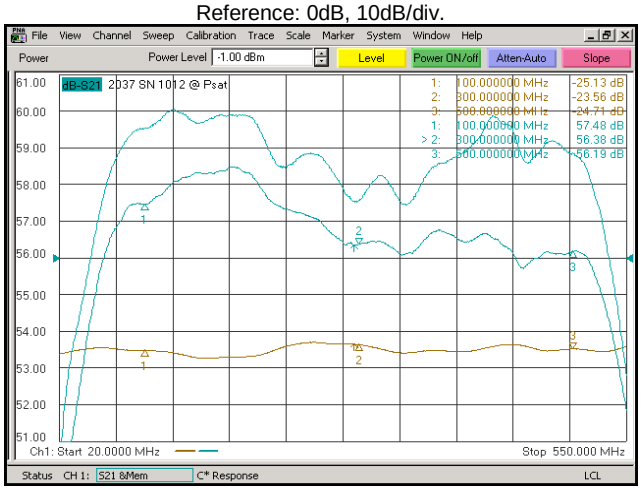
TYPICAL PERFORMANCE PLOTS

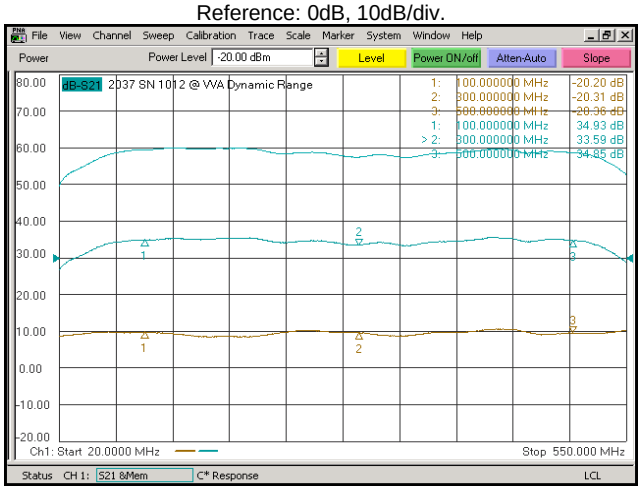
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} -3.0dBm
Reference: 56dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



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: 58dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range
Top Curve: Maximum Gain @ P_{IN} = -20dBm
Bottom Curve: Minimum Gain @ P_{IN} = -20dBm
Reference: 30dB, 10dB/div.
Middle Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.



Plot 4 – ALC Flatness @ 150W & 30W
Top Curve: ALC @ 150W, P_{IN} = 0dBm
Bottom Curve: ALC @ 30W, P_{IN} = 0dBm
Reference: 49dB, 1dB/div.
Middle Curve: Input Return Loss
Reference: 0dB, 10dB/div.