EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2030 - BBS3Q7EKO

800 – 4200 MHz / 100 Watts

The BBS3Q7EKO (2030) is suitable for P, L & S bands broadband high power linear applications. This amplifier utilizes high power GaAsFET devices that provide wide frequency response and dynamic range, high gain, low distortions, and excellent linearity. Employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, and all qualified components achieve exceptional performance, and high efficiency. The system includes a universal voltage, single phase, 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#: 2030FLFAAXXXX

- Solid-state class A linear design
- Instantaneous broadband
- Small and lightweight, High reliability and ruggedness
- Front panel manual gain adjust or LCD controller
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- Built in control, monitoring & protection circuits

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

Parameter		Symbol	Min	Typ	Max	Unit
Operating Frequency		BW	800		4200	MHz
Output Power CW	800-4000MHz	P_{SAT} [1]	100			Watt
	4000-4200MHz	P_{SAT} [2]	80			
Output Power @ 1dB Gain Compression		P_{1dB} [1] P_{1dB} [2]	80 70			Watt
Power Gain @ 1dB Gain Compression		G_{1dB}	50			dB
Input Power for Rated P_{SAT}		P_{IN}		0		dBm
Small Signal Gain Flatness		ΔG			±2.0	dB
Input Return Loss		S_{11}			-10	dB
Third Order Intercept Point 2-Tone @ 40dBm/Tone, 100kHz Spacing		IP3		+60		dBm
Noise Figure		NF			10	dB
Harmonics @ P_{OUT} = 70W		H			-20	dBc
Spurious Signals		Spur		70	60	dBc
Operating Voltage (1-phase)		V_{AC}	100		240	Volt
Power Consumption @ Rated P_{SAT}		P_D			1250	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	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 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		

LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 70W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

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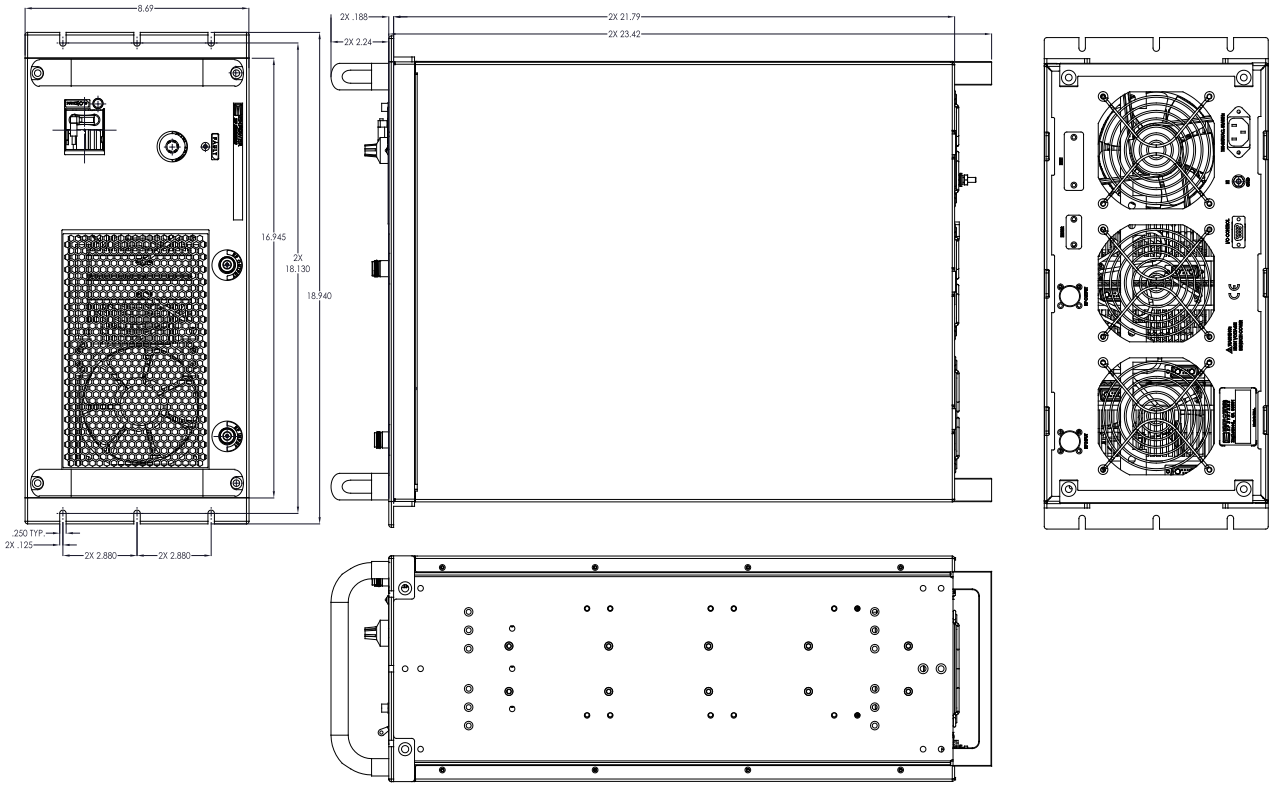
AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
2030FLFAAXXXX	LCD controller, Front 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. ***Note:*** ***(Output power is lowered by 0.5-0.75dB with this option)***
2030FFFAAXLXX	FGA (Front Gain Adjust), Front RF connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	

I/O CONNECTOR – D-sub 9-Pin, Female

Pin #	Description	Specification	Options FGA	Options LCD
1	FWD Test Point	Analog voltage 0-5V_{DC} relative to Forward Power Level		√
2	REV Test Point	Analog voltage 0-5V_{DC} relative to Reverse Power Level		√
3	5V Test Point	Test point voltage +5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	Test point voltage +5.60V_{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5 V) (*Internally Pulled-low*)	√	√
6	12V Test Point	Test point voltage 12.0V_{DC} ±0.5 Test Point	√	√
7	P/S Test Point	Test point voltage 12.0-15.0V_{DC}	√	√
8&9	GND	Ground	√	√

OUTLINE DRAWING SHOWN
***SKU#:* 2030FLFAAXXXX**



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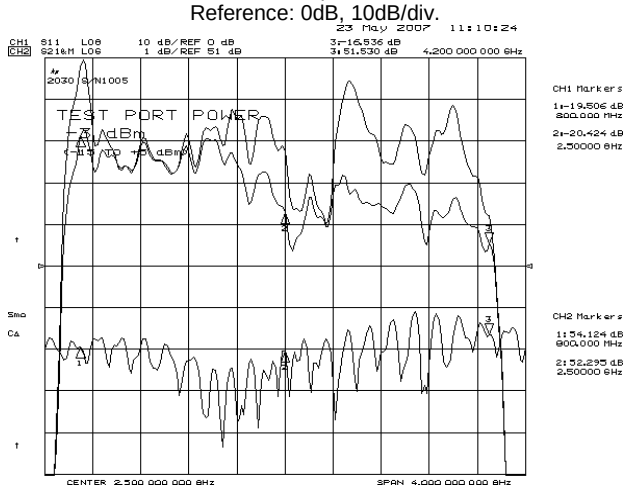
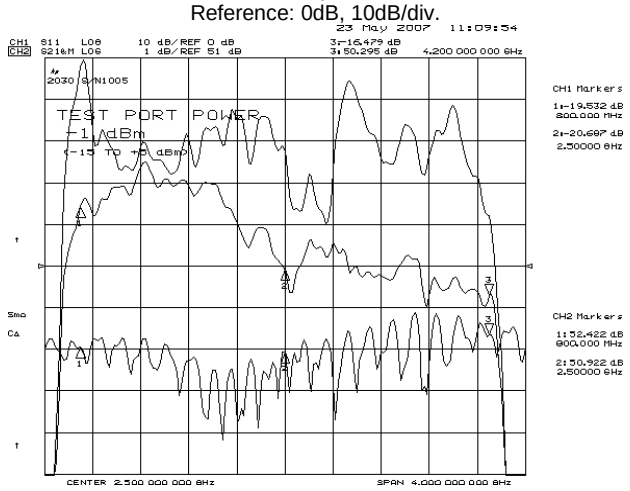
TYPICAL PERFORMANCE PLOTS

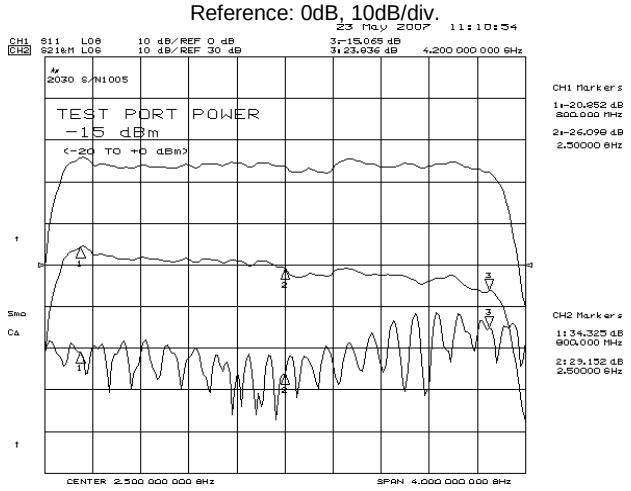
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -3.0dBm
Reference: 51dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



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: 51dB, 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 @ 50W & 10W
Top Curve: ALC @ 50W, P_{IN} = 0dBm
Bottom Curve: ALC @ 10W, P_{IN} = 0dBm
Reference: 44dB, 1dB/div.
Middle Curve: Input Return Loss
Reference: 0dB, 10dB/div.