EMPOWER
RF SYSTEMS, INC.

Solid State General Communication Power Amplifier

4007 - GCS1D2GPQ

1.5 – 32 MHz / 300 Watts

The GCS1D2GPQ (4007) is suitable for broadband high power applications. This rack mount amplifier utilizes high power push-pull MOSFET 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, 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#: 4007DLFAAXLXX

- Solid-state class AB design
- Instantaneous broadband
- Small form factor and lightweight
- Front panel LCD controller or manual gain adjust
- Built-in control. monitoring & protection circuits
- Suitable for all modulation types
- 50 Ohm Input/Output impedance
- High reliability and ruggedness

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

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	1.5		32	MHz
Output Power CW	P_{SAT}	300			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	200			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	54			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	30		dB
Input Return Loss	S_{11}			-10	dB
Harmonics @ P_{OUT} = 200W	H		-20		dBc
Noise Figure @ maximum gain	NF		7	10	dB
Third Order Intercept Point 2-Tone @ 44dBm/Tone, 100kHz Spacing	IP3		+58		dBm
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption @ 300W CW	P_D			1200	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions W x H x D	19 x 5.25 x 22	Inch
Weight	50	Pound
RF Connectors Input/Output	Type-N, Female	
Cooling	Built-in forced-air cooling system	

ENVIRONMENTAL SPECIFICATIONS (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 level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 200W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

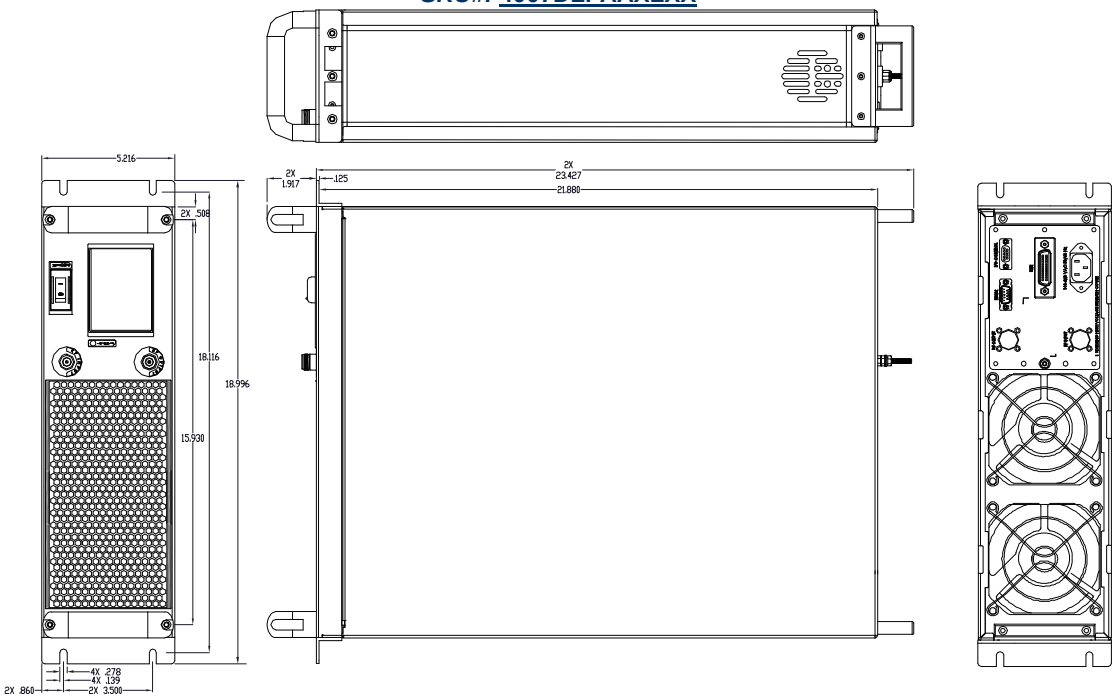
AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
4007DLFAAXLXX	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)***
4007DLRAAXLXX	LCD controller, Rear RF connectors 100-240VAC, 50/60Hz.	
4007DFFAAXXXX	FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	

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

Pin #	Description	Specification	Option	
			FGA	LCD
1	Forward TP	Analog Voltage 0-5V_{DC} relative to Forward Power Level		√
2	Reverse TP	Analog Voltage 0-5V_{DC} relative to Reverse Power Level		√
3	5V TP	Test point: 5.0V_{DC} ±0.2V	√	√
4	VVA TP	Test point: 5.6V_{DC} ±0.2V	√	
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: 26.0-30.0V_{DC}	√	√
8&9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN
SKU#: 4007DLFAAXLXX



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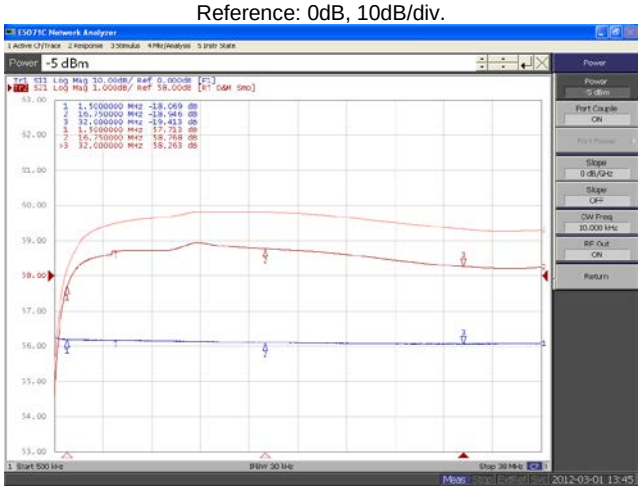
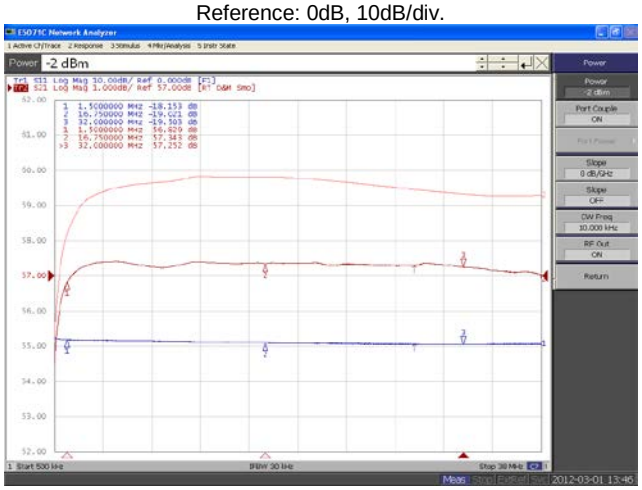
TYPICAL PERFORMANCE PLOTS

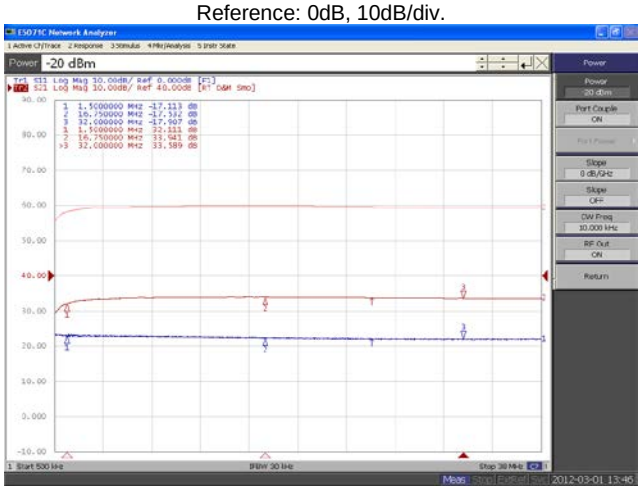
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -5.0dBm
Reference: 58dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = -2.0dBm
Reference: 57dB, 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: 40dB, 5dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.



Plot 4 – ALC Flatness @ 150W & 30W
Top Curve: ALC @ 150W, P_{IN} = 0dBm
Middle Curve: ALC @ 30W, P_{IN} = 0dBm
Reference: 48dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.