

Solid State Broadband High Power Amplifier

2224
1000 – 2000 MHz / 150 Watts

Outdoor Rated Tower Mount Amplifier

The 2224 is suitable for broadband high power linear applications. This amplifier system utilizes GaN on SiC power 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, EMI/RFI filters, machined housings and qualified components.

Empower RF's ISO9001:2015 Quality Assurance Program assures consistent performance and the highest reliability

- Solid-state Class AB design
- Small form factor and lightweight
- Suitable for CW/FM modulation standards
- 50 ohm input/output impedance
- Built-in control, monitoring & protection circuits
- High reliability and ruggedness



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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		2000	MHz
Power Output CW <i>(Note 1)</i>	P _{SAT}	125	150		Watt
Power Output @ 1dB Gain Compression <i>(Note 2)</i>	P _{1dB}	65	100		Watt
Input Power for Rated Output	P _{IN}		-5	0	dBm
Small Signal Gain, P _{IN} = -30dBm	G _{SS}	56			dB
Small Signal Gain Flatness	ΔG		±1.5	±2.0	dB
Gain Adjustment Range	VVA	20			dB
Input Return Loss	S ₁₁			-10	dB
Third Order Intermodulation Distortion 2-Tone, 44dBm/Tone, 1MHz Spacing	IM3		-20	-15	dBc
Harmonics @ P _{OUT} = 125W	2 ND			-15	dBc
	3 RD			-10	
	4 TH			-20	
	5 TH			-15	
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (single phase)	V _{AC}	100		250	Volt
AC Power Consumption @ 125W CW	P _D		620	850	VA

Notes: 1. CW measurement performed in MGC Mode (Manual Gain Control)
 2. P_{1dB} measurements performed with AM 80% depth of modulation, 1 kHz modulation signal

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimension W x H x L	11.00 x 8.00 x 23.60	Inch
Weight	78	Pound
RF Connectors Input / Output	N-Type, Female	J2 / J5
RF Sample Connector	N-Type, Female	J4
RF RX connector	N-Type, Female	J3
LAN Interface Connector	Ethernet , RJ-45	J6
Cooling	Forced Air Cooling	-
AC Input Connector	Circular Connector, 4-pin (Amphenol: C016 20C003 100 12) (Mating Connector: Amphenol: C016 20D003 100 12)	J1

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _C	-40		+80	°C
Storage Temperature	T _{STG}	-40		+85	°C
Environmental Protection	RH	NEMA 4			-
Altitude (MIL-STD-810F Method 500.4)	ALT			30,000	Feet

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PROTECTIONS

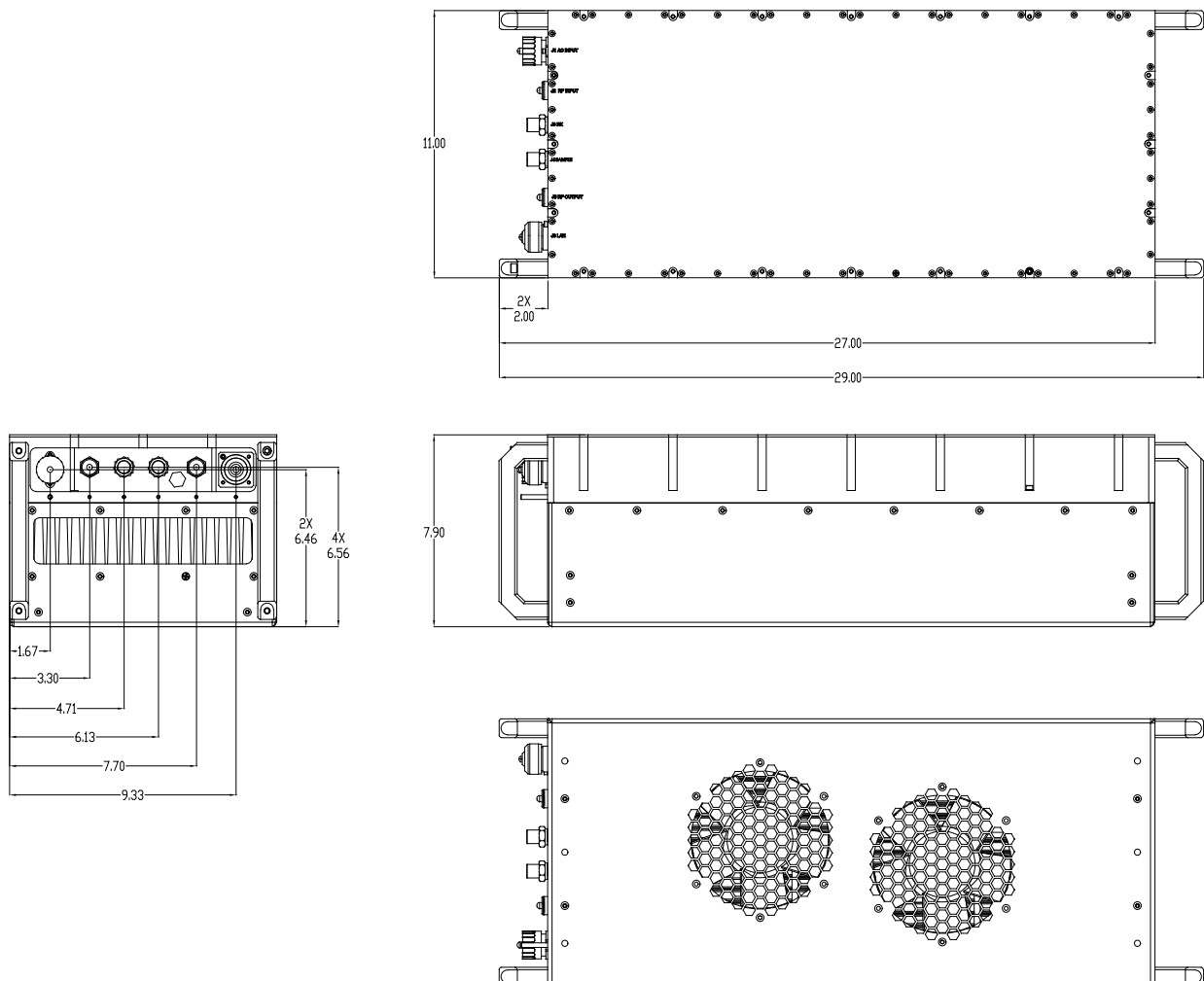
Parameter	Symbol	Specification	Unit
VSWR Protection	Ψ	At 3:1 – PA backs-off output power to safe level	-
Thermal Overload	T _{OL}	95°C Case – Shutdown per GUI reported temperature	Max
Overdrive	P _{OD}	+10	dBm

COMMUNICATION INTERFACE

Function	Utility	Connector
Ethernet	Network management of device / web interface	RJ45

EXTERNAL AC CIRCULAR CONNECTOR, 4 Pin

Pin #	Function	Specification
1	Line 1	100 to 250VAC Single phase (Line 2 is neutral for 120VAC application)
2	Line 2	
3	N/C	No Connection
4	GND	Ground

MECHANICAL OUTLINE


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TYPICAL PERFORMANCE PLOTS

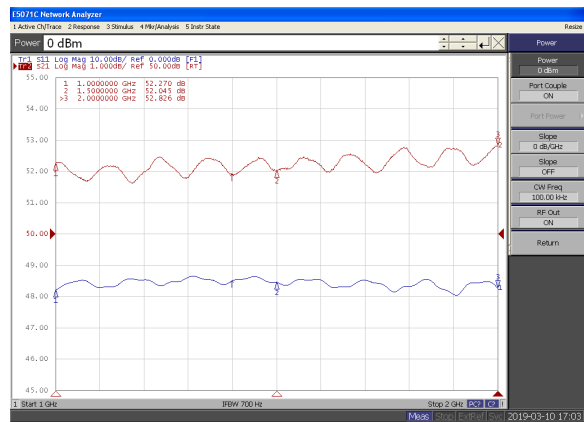
Plot 1 – Small Signal Gain

Top Curve: Small Signal Gain @ $P_{IN} = -30\text{dBm}$
Reference: 65dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – ALC Flatness @ 150W

Top Curve: Mode ALC @ $P_{IN} = 0\text{ dBm}$
Reference: 50dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range @ $P_{IN} = -30\text{dBm}$

Top Curve: Maximum Gain
Middle Curve: Minimum Gain
Reference: 30dB, 10dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.

