

Solid State General Communication Power Amplifier

4015 - GCS4P4RUT
1750 – 1850 MHz / 1000 Watts

The GCS4P4RUT (SKU 4015) is suitable for L-Band high power linear applications. This amplifier utilizes high power Push-Pull 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. The amplifier is constructed of three modular drawers all housed in a modern and rugged rack cabinet. Each LRU 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.

- Solid-state class AB linear design
- Instantaneous bandwidth
- Standard front panel manual gain adjust
- Optional Touchscreen LCD for local and remote interface
- Suitable for all modulations standards
- 50 ohm input/output impedance
- High reliability and ruggedness



ELECTRICAL SPECIFICATIONS @ 208 VAC, 3 ϕ , 25°C, 50 Ω System

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	1750		1850	MHz
Power Output CW	P _{SAT}	1000			Watt
Power Output @ 1 dB Gain Compression Point	P _{1dB}		600		Watt
Power Gain @ P1 dB Gain Compression Point	G _{1dB}	60			dB
Input Power for Rated Pout	P _{IN}		0		dBm
Gain Flatness	Δ G			\pm 1.0	dB
Gain Adjustment Range	FGA	25	30		dB
Input/Output Return Loss	S11/S22			-10	dB
Harmonics @ rated 1dB Gain Compression Point	H		-40		dBc
Noise Figure	NF			10	dB
Third Order Intercept Point	IP3		+69		dBm
2-tone IMD @ 57 dBm/Tone, Δ = 0.5 MHz			-70	-60	dBc
Spurious Signals	Spur		-70	-60	dBc
Supply Voltage - 3 ϕ , 120 VAC/Phase	VAC		208		Volt
Power Consumption	P _D			7000	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions W x H x D/ Weight with enclosure	21.79"x33.53"x30.71" / 400lb.	Typ
Dimensions W x H x D / Weight w/o enclosure	19"x26.25"x22" / 300 lb.	Typ
RF Connectors FCN or RCN option	Input: Type-N female, Output: 7/16 female	
Cooling	Built in forced-air system	

ENVIRONMENTAL SPECIFICATIONS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	T _c	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	10,000		30,000	Feet
Shock / Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		-

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PROTECTIONS

Input Overdrive	+10 dBm	Max
Load VSWR @ rated P1 dB Gain Compression Point	5:1 @ any angle & magnitude	Nom
Thermal Overload	85°C shutdown	Max

AVAILABLE OPTIONS (Refer to www.empowerrf.com for detailed available options)

Option	Number	Description	Price
FGA	061	Front panel manual gain adjustment 10 turns	Standard
LCD	062	Local: Front panel touch screen LCD controller including Fwd/Rev Power indication (dB or Watt scale), Gain Adjustment, ALC Fast/Slow & On/Off, Standby mode, Fault indication. Remote: Rear panel HPIB IEEE-488.2 or full duplex RS232 serial interface. Note: Output Power is lowered by 0.5 - 0.75dB with this option.	Call
FCN	051	Front Panel Type-N, SC or 7/16	N/C
RCN	052	Rear Panel Type-N, SC or 7/16	N/C

I/O CONNECTOR – Dsub, 9 Pin

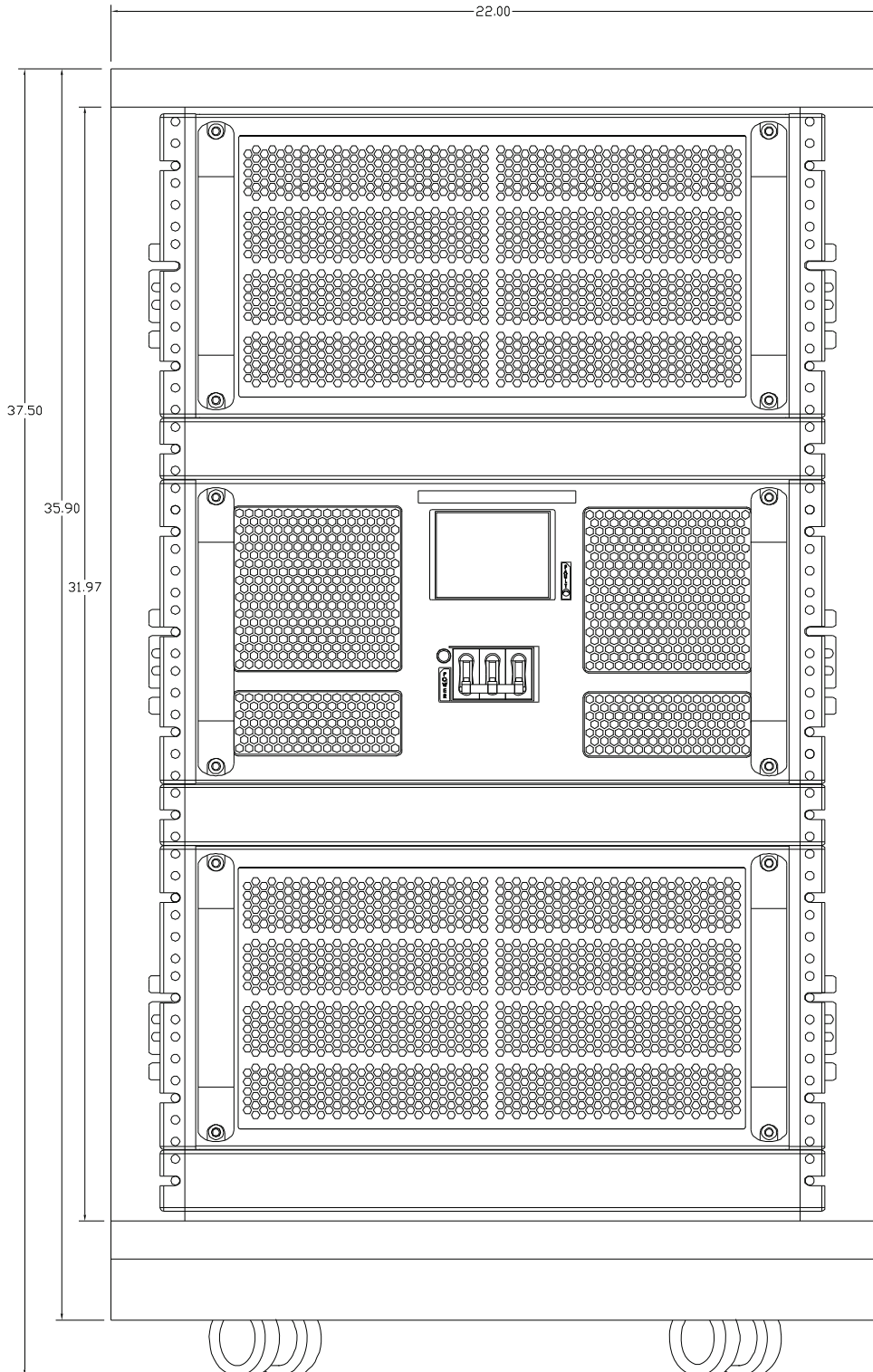
Pin #	Description	Specifications			
1	Forward Test Point	Analog Voltage 0-5 V Test Point relative to Forward Power Output			
2	Reverse Test Point	Analog Voltage 0-5 V Test Point relative to Reverse Power			
3	+5 V Test Point	Measurement Voltage Output 5 V			
4	N/C	Reserved			
5	EXT Shutdown	Amplifier Enable: TTL "Low" (0 V) or Open or Ground Amplifier Disable: TTL "High" (5 V)			
6	+12 V (Test Point)	Output 12 V Test Point			
7	PS+ (Test Point)	Unit supply voltage 28 V Test Point			
8	N/C	Reserved			
9	GND	Ground			

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SYSTEM OUTLINE DRAWING - FRONT VIEW



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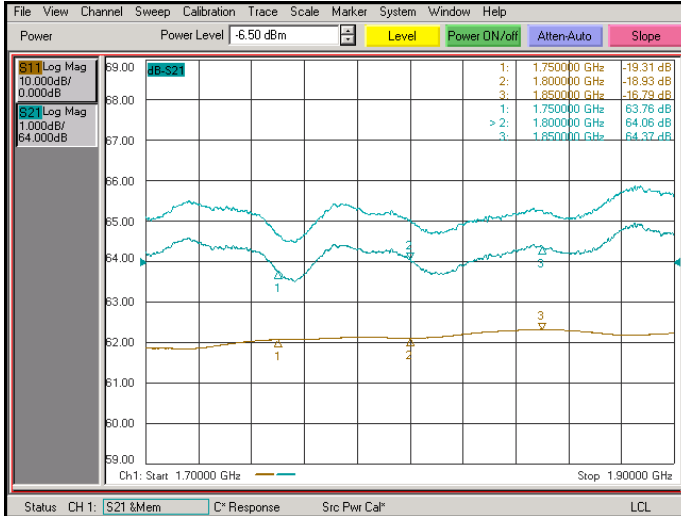
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TYPICAL PERFORMANCE PLOTS

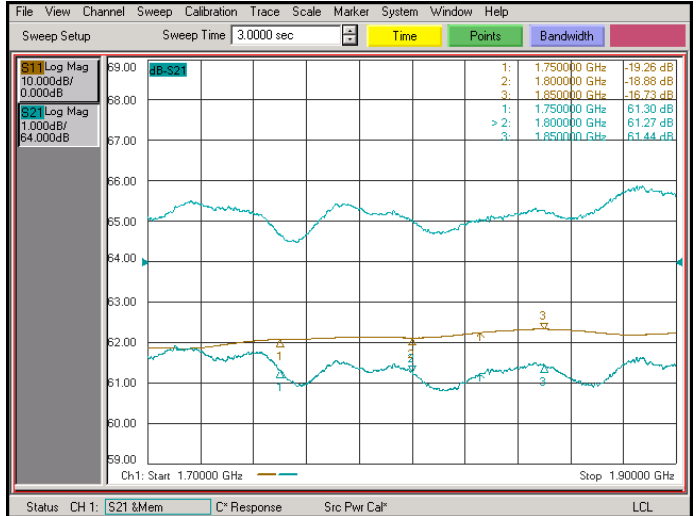
Plots 1 - Small Signal and P_{1dB} Gain

Top Curve: Small Signal Gain @ P_{IN} = -10dBm
 Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -6.5dBm
 Reference: 64dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



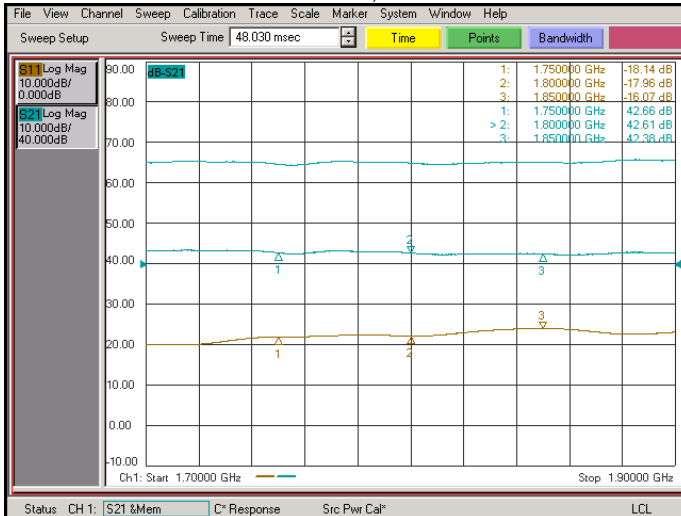
Plot 2 - Small Signal and P_{SAT}

Top Curve: Small Signal Gain @ P_{IN} = -10dBm
 Bottom Curve: P_{SAT} @ P_{IN} = -1dBm
 Reference: 64dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 3 - Gain Adjust Dynamic Range

Top Curve: Maximum Gain @ P_{IN} = -10dBm
 Middle Curve: VVA @ Minimum Gain
 Reference: 40dB, 10dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



ALC Flatness @ 500W & 100W

Top Curve: ALC @ 500W, P_{IN} = 0dBm
 Bottom Curve: ALC @ 100W, P_{IN} = 0dBm
 Reference: 54dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div.

