

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 | Spur | | -70 | -60 | dBc |
| Supply Voltage - 3 ϕ , Delta Connection Line to Line | VAC | 180 | 208 | 264 | 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 (Design to Meet)

| 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 – D-sub, 9-Pin

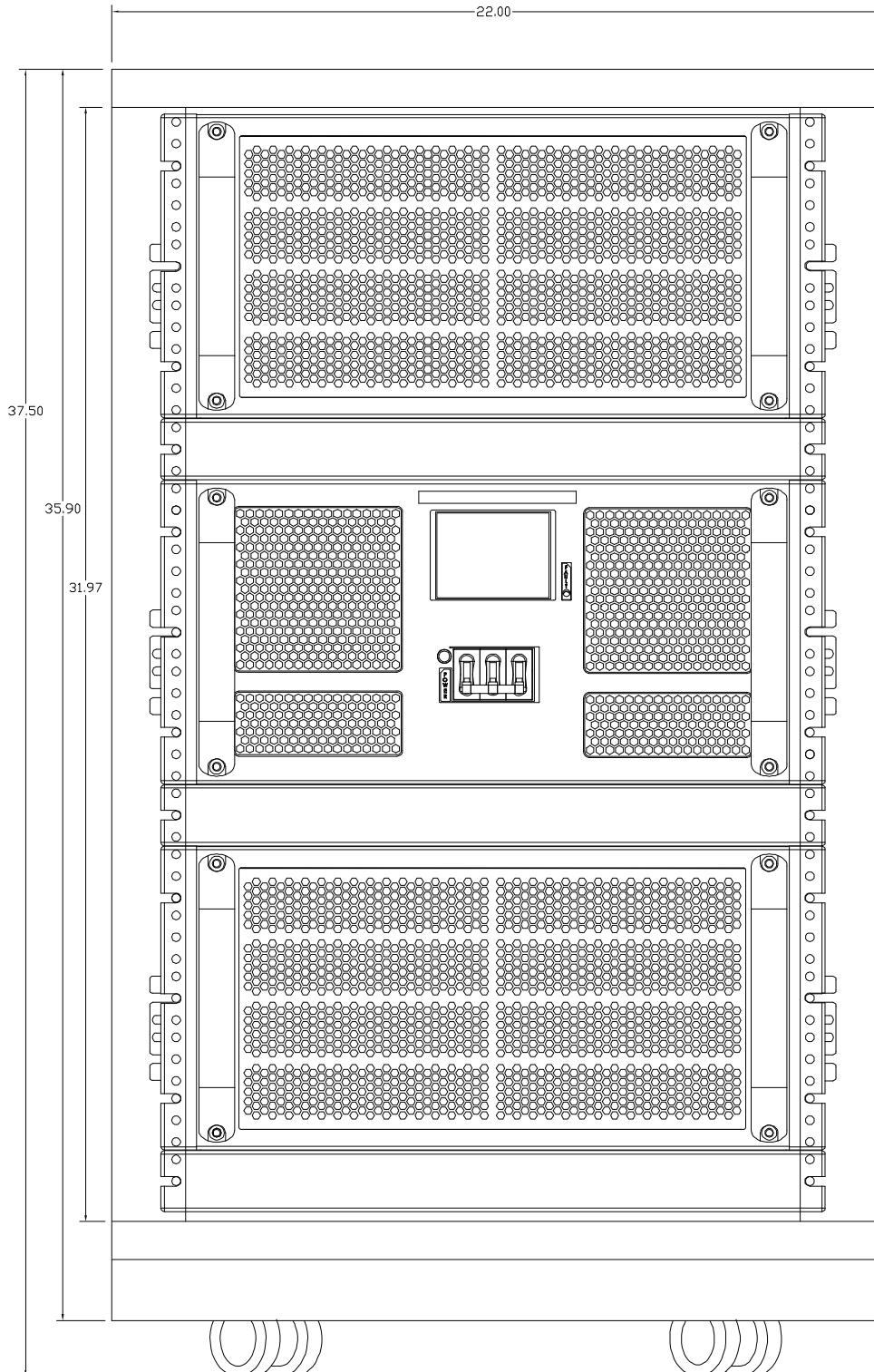
| Pin # | Description | Specifications | | | |
|-------|--------------------|--|--|--|--|
| 1 | Forward Test Point | Analog Voltage 0-5 V Test Point relative to Forward Power Output | | | |
| 2 | Reverse Test Point | Analog Voltage 0-5 V Test Point relative to Reverse Power | | | |
| 3 | +5 V Test Point | 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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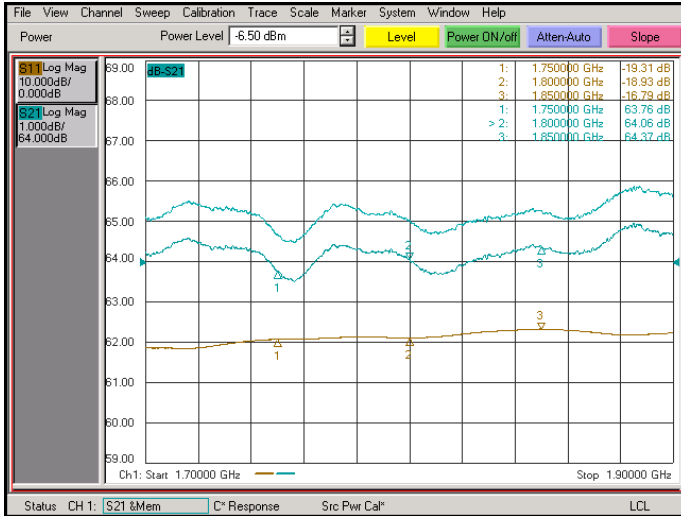
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TYPICAL PERFORMANCE PLOTS

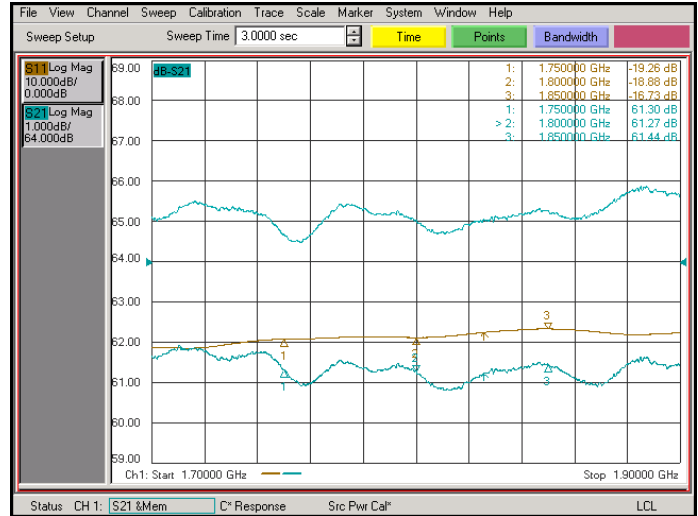
Plots 1 - Small Signal and P_{1dB} Gain

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.



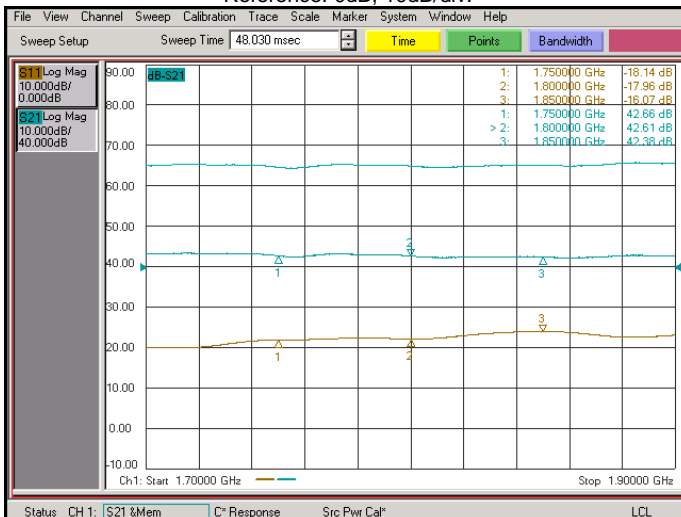
Plot 2 - Small Signal and P_{SAT}

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.

