

Solid State General Communication Power Amplifier

4030 – GCS3C3FRR
100 - 250MHz / 500 Watts

The GCS3C3FRR (4030) is suitable for broadband VHF high power applications. This rack mount amplifier utilizes push-pull MOSFET 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, 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#: 4030DLRAAXLXX

- Solid-state class AB design
- Instantaneous broadband
- Small form factor and lightweight
- Front panel manual gain adjust
- Suitable for CW, AM and FM (Consult factory for other modulation types)
- 50 Ohm Input/Output impedance
- High reliability and ruggedness

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	100		250	MHz
Output Power CW	P _{SAT}	500			Watt
Output Power @ 1dB Gain Compression	P _{1dB}	300	400		Watt
Power Gain @ P _{1dB}	G _{1dB}	56			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	25		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ maximum gain	NF		10		dB
Third Order Intercept Point 2-Tone @ 47dBm/tone, 100kHz spacing	IP3		+62		dBm
Harmonics @ P _{OUT} = 300W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V _{AC}	100		240	Volt
Power Consumption @ P _{OUT} = 500W	P _D			1650	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 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 w/o condensation	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	+6dBm	Max
Load VSWR @ P _{OUT} = 500W	5:1 @ all load phase & amplitude	-
Thermal Overload	85°C shutdown	Max

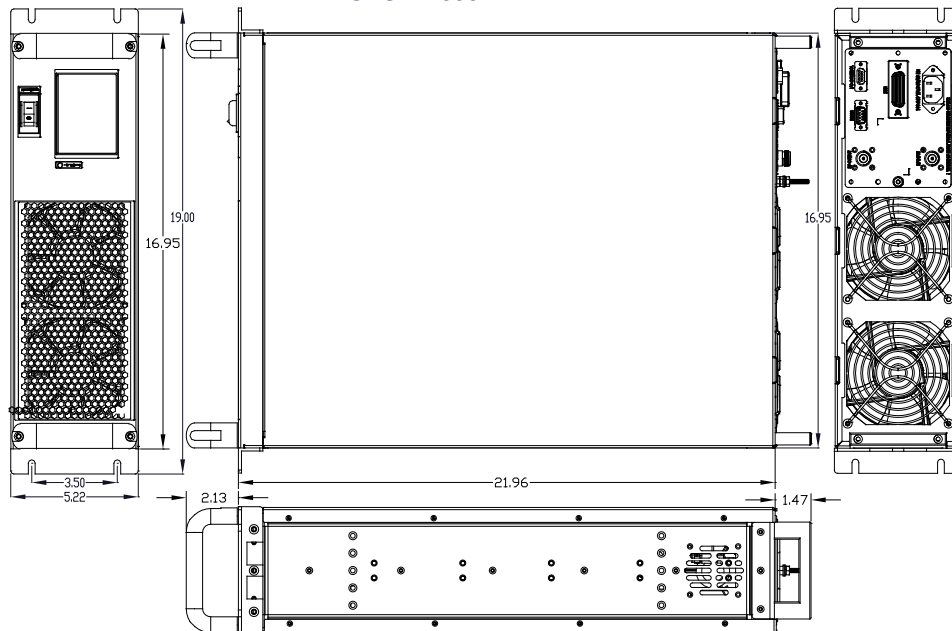
AVAILABLE OPTION

SKU #	Description	LCD Touchscreen
4030DLRAAXLXX	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. <i>Note: (Output power is lowered by 0.5-0.75dB with this option)</i>
Optional	Rack Slides (Call for price)	

I/O CONNECTOR – D-Sub 9-Pin, Female

Pin#	Description	Specification
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	N/C	No Connection
5	EXT Shutdown	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#: 4030DLRAAXLXX



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PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -4.0dBm$
 Reference: 57dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



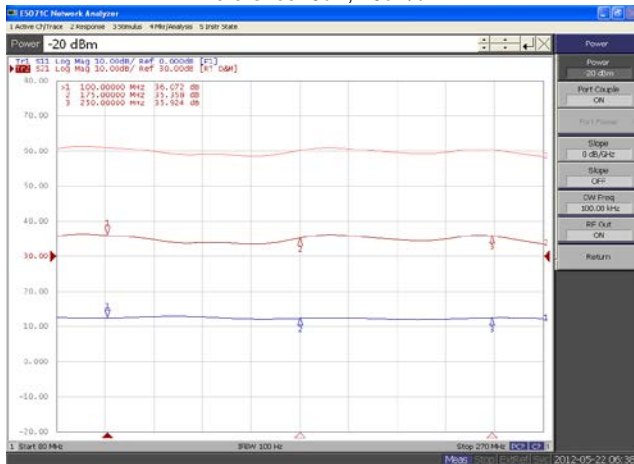
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{SAT} , $P_{IN} = 0.0dBm$
 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: 30dB, 10dB/div.
 Bottom Curve: Input Return Loss @ Minimum Gain
 Reference: 0dB, 10dB/div.



Plot 4 – ALC Response @ 250W & 50W

Top Curve: ALC @ 250W, $P_{IN} = 0dBm$
 Bottom Curve: ALC @ 50W, $P_{IN} = 0dBm$
 Reference: 50dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div.

