

# Solid State Broadband High Power Amplifier

**2074 - BBS3C3KUT**
**100 – 500 MHz / 1000 Watts**

The BBS3C3KUT (SKU 2074) is suitable for broadband or band specific high power linear, CW and pulse applications. This amplifier utilizes high power push-pull MOSFET devices that provide wide frequency response, high gain, high peak power capability, and low distortions. Exceptional performance, long-term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, and all qualified components. The amplifier is constructed of two modular drawers and is housed in an optional rack cabinet. The main LRU includes the RF power section while the second LRU holds the main power supply and control circuits. The system operates from a single phase power supply and has a built in control, monitoring and protection functions and forced air-cooling system. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



- Solid-state linear design
- Instantaneous broadband
- Suitable for most modulation standards (AM, FM, PM, Pulse, Digital)
- Modular design
- 50 ohm input/output impedance
- Built in Control, Monitoring and Protection functions
- High reliability and ruggedness

## ELECTRICAL SPECIFICATIONS @ 208 VAC, 3 $\phi$ , 25°C, 50 $\Omega$ System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	100		500	MHz
Power Output CW	P <sub>SAT</sub>	1100	1200		Watt
Power Output @ 1 dB Gain Compression Point	P <sub>1dB</sub>	800	1000		Watt
Gain @ P1 dB Gain Compression Point	G <sub>1dB</sub>	60			dB
Input Power for rated output power	P <sub>IN</sub>			1.0	mW
Gain Flatness / Leveled ALC	$\Delta$ G			$\pm 2.0 / \pm 0.5$	dB
Gain Adjustment Range	VVA	20	25		dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure @ maximum gain	NF		10		dB
Third Order Intercept Point	IP <sub>3</sub>		+69		dBm
Harmonics @ 100-200 MHz, 200-500 MHz	2 <sup>nd</sup>		-40	-30	dBc
	3 <sup>rd</sup>		-15		
Spurious Signals	Spur			-70	dBc
Operating Voltage (3 phase)	V <sub>AC</sub>	180	208	260	Volt
AC Power Consumption @ 1000 W CW	P <sub>D</sub>			5000	Watt

## MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions W x H x D / Weight w/o enclosure	17 x 14 x 22 (432 x 35 x 560)	Inc (mm)
Weight	150	lb.
RF Connectors Input/Output	Type-N female / SC-Type Female	
Cooling	Built in forced-air system	

## ENVIRONMENTAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	T <sub>c</sub>	0		+50	°C
Non-operating Temperature	T <sub>stg</sub>	-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 P1dB Gain Compression Point	$\infty$ @ any angle & magnitude	Nom
Thermal Overload	85°C shutdown	Max

**SELECTED AVAILABLE OPTIONS** (Refer to [www.empowerrf.com](http://www.empowerrf.com) for complete options listing)

Option	Number	Description	Price
<b>FGA</b>	<b>061</b>	Front panel manual gain adjustment 10 turns	Standard
<b>LCD</b>	<b>062</b>	<b>Local:</b> Front panel touch screen color LCD controller including Fwd/Rev Power indication (dB or Watt scale), VSWR, RF Gain, Gain Adjustment, ALC Fast/Slow & On/Off, Standby mode, Fault indication, Fault reset. <b>Remote:</b> Rear panel HPIB IEEE-488.2 or full duplex RS232 serial interface. <b>Note: Output Power is lowered by 0.5 - 0.75 dB with this option.</b>	Call
<b>ACC</b>	<b>033</b>	208 VAC, 3-Phase, 50-400 Hz	Call
<b>DCC</b>	<b>043</b>	28 VDC external voltage source, steady state voltage range of 24-29 VDC, ripple (10-1000 Hz) $\pm 2$ V max within above range. To be undamaged by steady state voltage in the range of 18-29 Vdc, over-voltage surges of +80 VDC for 100 mSec, under-voltage surges of +8 VDC for 50 mSec, and voltage spikes of $\pm 600$ V for $\mu$ Sec for both polarities.	Call
<b>INT</b>	<b>063</b>	Rear Panel Interlock function – <b>Blanking</b> via TTL Command	N/C
		Rear Panel 7/16 output available upon special request.	Call

**I/O CONNECTOR – Dsub, 9 Pin**

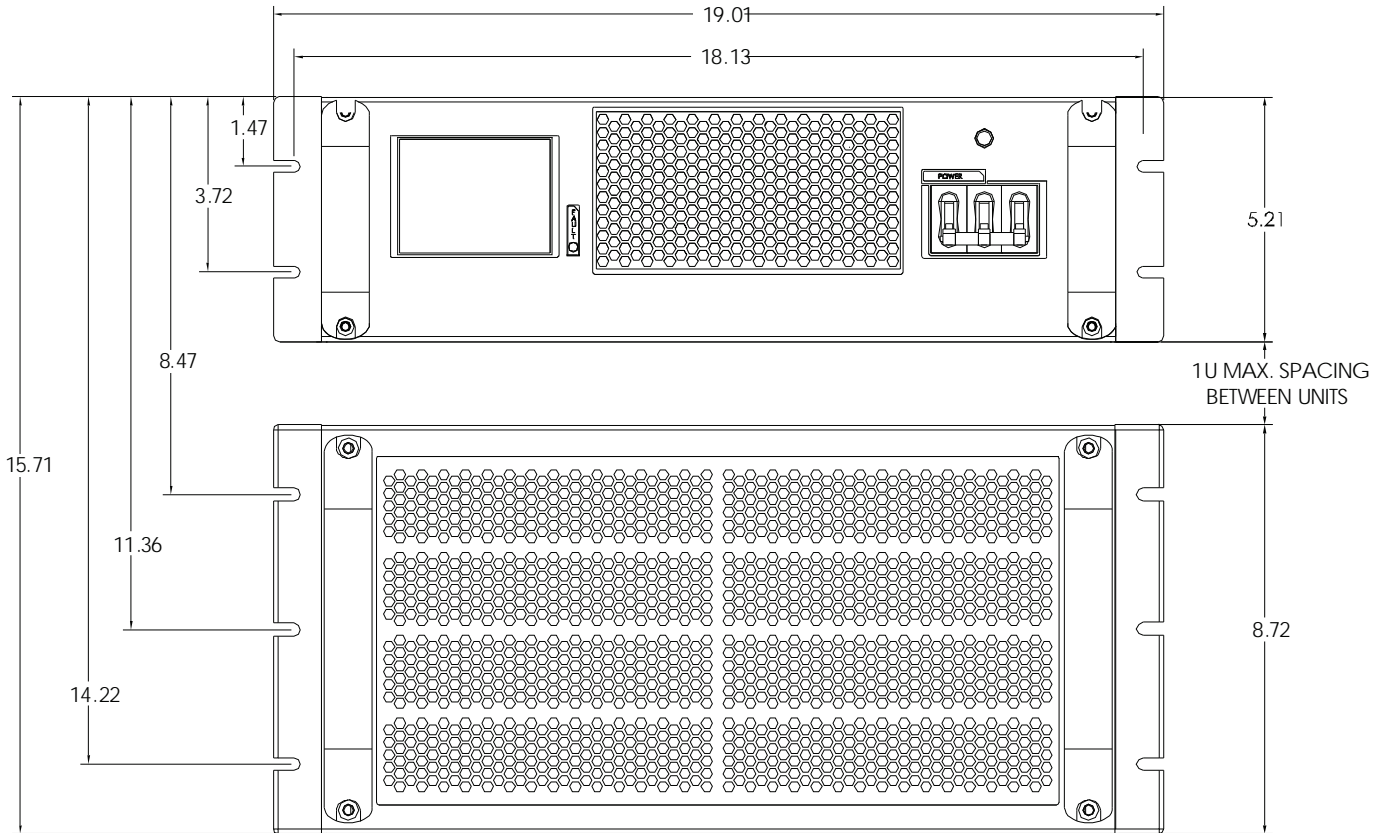
Pin #	Description	Specifications			
1	Forward Test Point	Analog Voltage 0-5 V Test Point relative to Forward Power Output			
2	Reverse Test Point	Analog Voltage 0-5 V Test Point relative to Reverse Power			
3	+5 V Test Point	Measurement Voltage Output 5 V			
4	N/C	Reserved			
5	EXT Shutdown	Disable: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

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OUTLINE DRAWING - FRONT VIEW

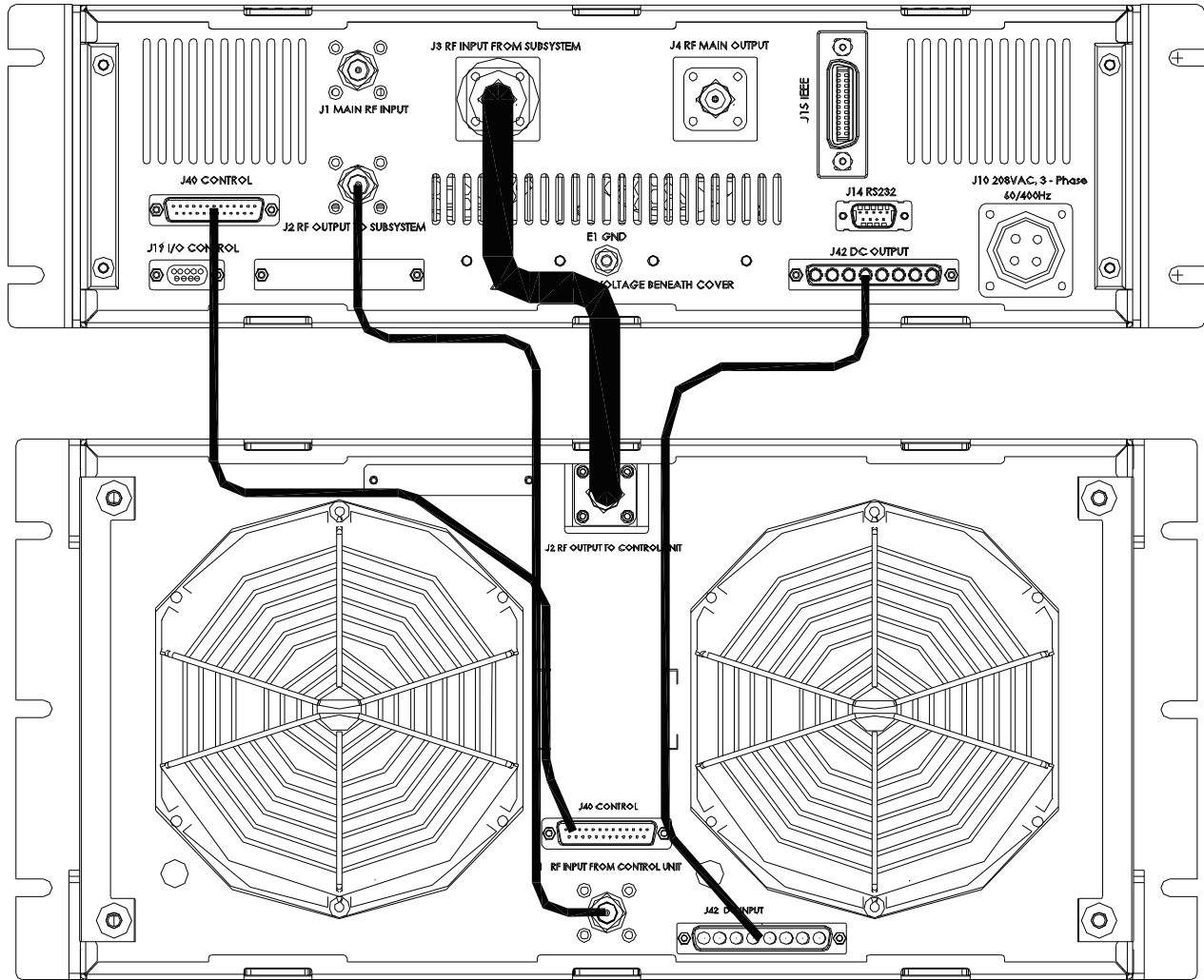


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OUTLINE DRAWING - REAR VIEW



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## TYPICAL PERFORMANCE PLOTS

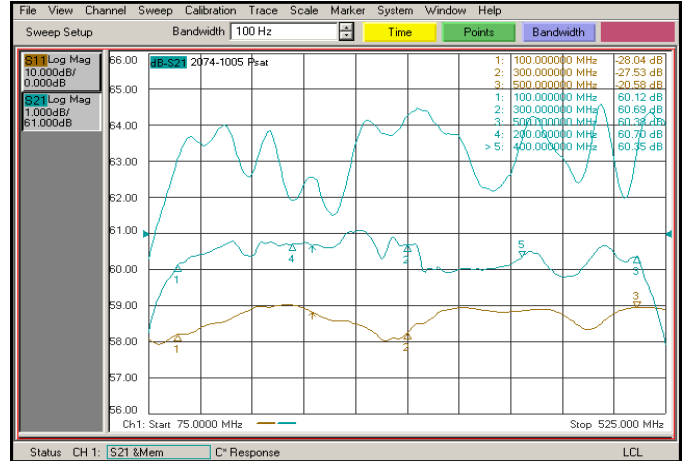
### Plots 1 - Small Signal and $P_{1dB}$ Gain

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -1.0dBm$   
 Reference: 62dB, 1dB/Div.  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/Div.



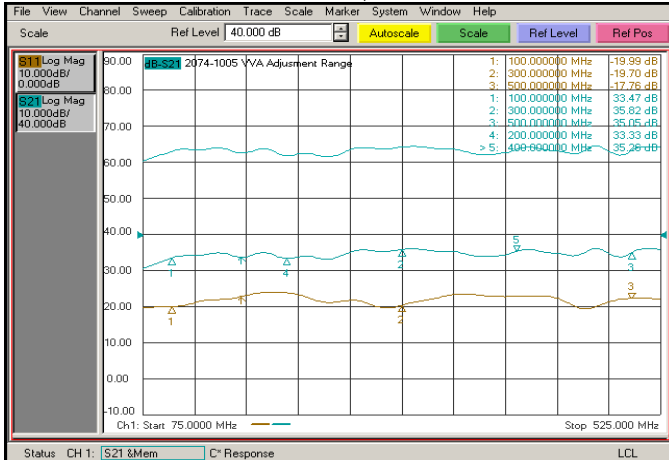
### Plot 2 - Small Signal and $P_{SAT}$

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve:  $P_{SAT}$  @  $P_{IN} = 1.0dBm$   
 Reference: 61dB, 1dB/Div.  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/Div.



### Plot 3 - Gain Adjust Dynamic Range

Top Curve: Maximum Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Minimum Gain  
 Reference: 40dB, 5dB/Div.  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/Div.



### Plot 4 - ALC Flatness @ 500W & 100W

Top Curve: ALC @ 500W,  $P_{IN} = 0dBm$   
 Middle Curve: ALC @ 100W,  $P_{IN} = 0dBm$   
 Reference: 53dB, 2dB/Div.  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/Div.

