

Solid State Broadband High Power Amplifier

2054 – BBS4A6AAJ

1000 – 3000 MHz / 10 Watts

The BBS4A6AAJ (2054) amplifier is suitable for broadband RF/Microwave high power linear applications; these amplifiers are utilizing linear GaAsFET power devices that provide high gain, wide dynamic range, low distortions and excellent 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 Quality Assurance Program assures consistent performance and the highest reliability.



SKU#: 2054CLRAAXXX

- Solid-state Class A design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Standard front panel manual gain adjust
- Suitable for CW, AM, and FM (Consult factory for other modulation type)
- 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	1000		3000	MHz
Output Power CW	P _{SAT}	10	12		Watt
Output Power @ 1dB Gain Compression	P _{1dB}	8			Watt
Power Gain @ 1 dB Gain Compression	G _{1dB}	40			dB
Input Power for Rated P _{SAT}	P _{IN}		0		dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	FGA	25			dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure	NF		10		dB
Third Order Intercept Point 2-Tone @ 28dBm/Tone, 100kHz Spacing	IP3		+48		dBm
Harmonics @ P _{OUT} = 8W	H			-20	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V _{AC}	100		240	Volt
Power Consumption	P _D			100	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions – Bench Top / Rack Mount	8.5 x 3.5 x 16 / 19 x 3.5 x 18	Inch
Weight – Bench Top / Rack Mount	15 / 30	Pound
RF Connectors Input/Output	Type-N female	
Cooling	Built-in internal 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 (non-condensing)	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		

LIMITS

Input Overdrive	+10 dBm	Max
Load VSWR @ P _{OUT} = 8W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

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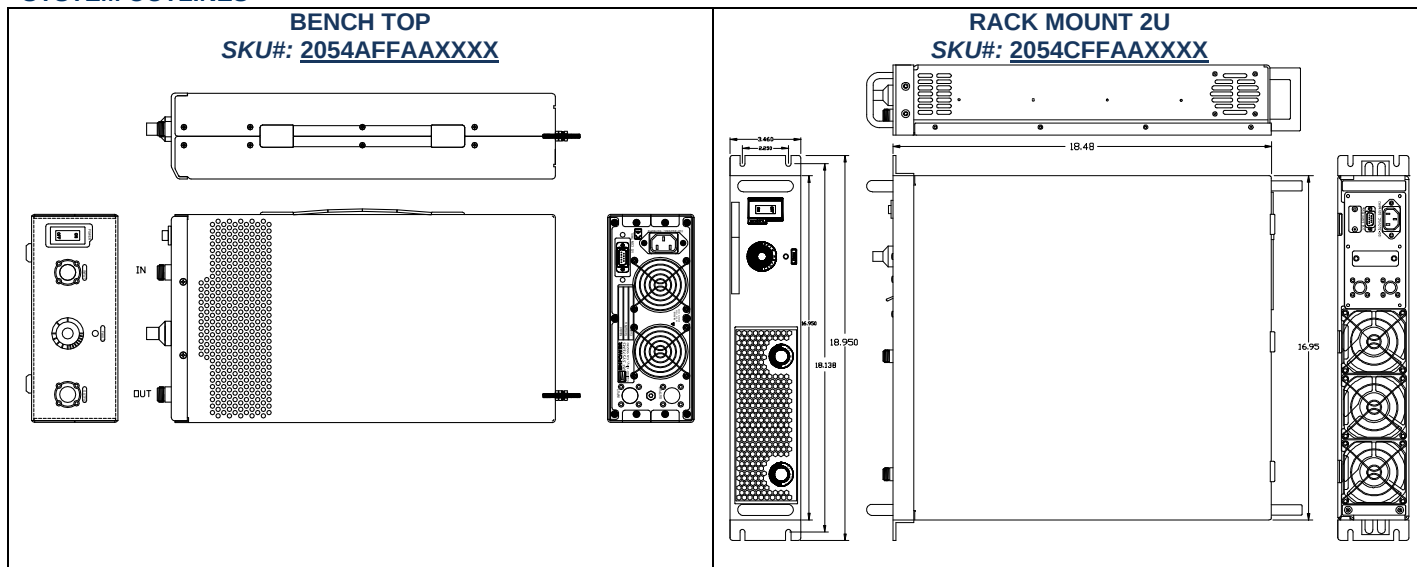
AVAILABLE OPTIONS

SKU Number	Description	LCD Touchscreen
2054CLRAAXXXX	LCD controller, Rear 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. Note: (Output power is lowered by 0.5-0.75dB with this option)
2054CFFAAXXXX	FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	
2054AFFAAXXXX	Bench Top, FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	

I/O CONTROL CONNECTOR – D-Sub 9-Pin, Female

Pin #	Description	Specification	Bench Top	Option FGA	LCD
1	Forward Test Point	Analog Voltage 0-5V _{DC} relative to Forward Power Level			√
2	Reverse Test Point	Analog Voltage 0-5V _{DC} relative to Reverse Power Level			√
3	5V Test Point	Test point: 5.0V _{DC} ±0.2V		√	√
4	VVA Test Point	Test point: 5.6V _{DC} ±0.2V	√	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) <i>(Internally Pulled-Low)</i>	√	√	√
6	12V Test Point	Test point 12.0V _{DC} ± 0.5V	√	√	√
7	P/S Test Point	Test point: 12.0-15.0V _{DC}		√	√
8&9	GND	Ground	√	√	√

SYSTEM OUTLINES



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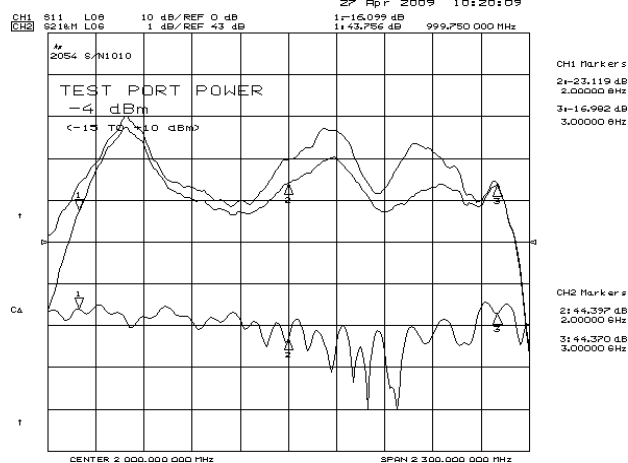
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TYPICAL PERFORMANCE PLOTS

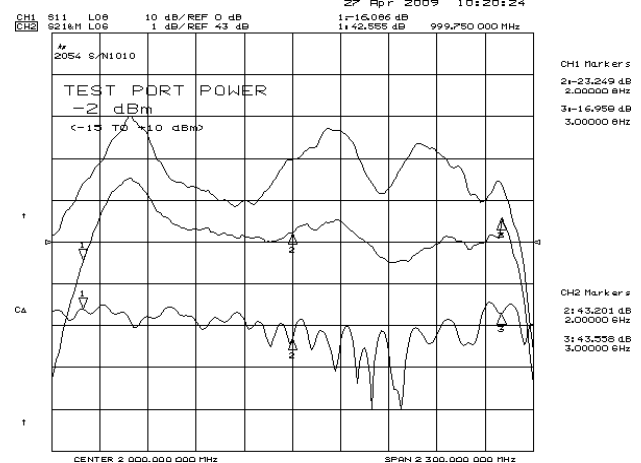
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ $P_{IN} = -15dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -4dBm$
 Reference: 43dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -15dBm$
 Middle Curve: Power Gain @ P_{SAT} , $P_{IN} = -2dBm$
 Reference: 43dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range

Top Curve: Maximum Gain @ $P_{IN} = -15dBm$
 Middle Curve: Minimum Gain @ $P_{IN} = -15dBm$
 Reference: 20dB, 10dB/div.
 Bottom Curve: Input Return Loss @ Minimum Gain
 Reference: 0dB, 10dB/div.

