

Solid State Broadband High Power Amplifier

1053 - BBMOD4A3F
0.15 – 1000 MHz / 2 Watts

The BBMOD4A3F (SKU 1053) is suitable for ultra broadband and band specific high power linear applications. This amplifier utilizes Silicon RF Power MOSFET devices that provide high gain, wide dynamic range and good 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.



- Solid-state Class A linear design
- Instantaneous ultra-broadband
- Built-in Variable Voltage Attenuator
- Small and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ +28V_{DC}, 25°C, 50Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	0.15		1000	MHz
Power Output CW	P _{SAT}	2	3		Watt
Power Output @ 1dB Gain Compression	P _{1dB}	1			Watt
Power Gain @ 1dB Gain Compression	G _{1dB}	30			dB
Input Power for Rated P _{SAT}	P _{IN}		0	3	dB
Gain Adjustment Range	FGA	25	30		dB
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ maximum gain	NF		7	10	dB
Harmonics @ P _{OUT} = 1W	H		-25		dBc
Third Order Intercept Point 2-Tone @ 24dBm/Tone, 100kHz Spacing	IP3		+39		dBm
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V _{DC}	24	28	32	Volt
Current Consumption @ P _{OUT} = 2W CW	I _{DD}		1.0	2.0	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimension	6.0 x 3.0 x 1.0	Inch
Weight	1.0	Pound
RF Connectors Input / Output	Type-SMA, Female	
DC Interface Connections	Feed Thru	
Cooling	External Heatsink (not supplied)	

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _C	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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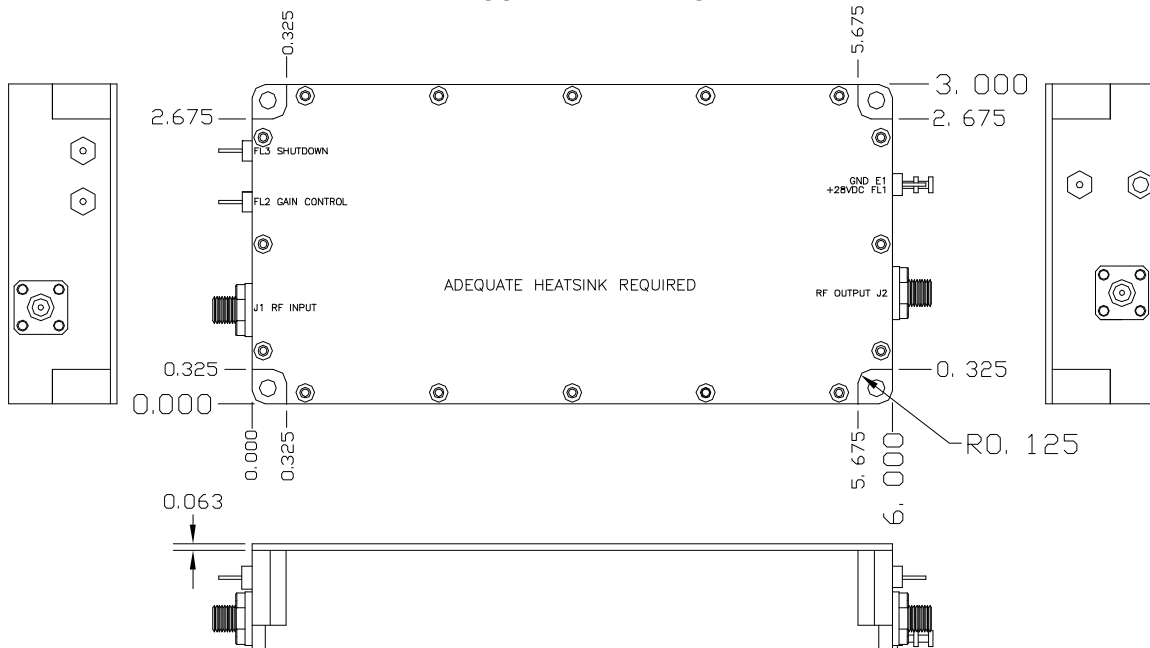
LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P _{OUT} = 2W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	80°C shutdown	Max

DC INTERFACE CONNECTIONS

Pin #	Description	Specification
FL1	+28.0V _{DC}	24.0-32.0V _{DC}
FL2	Gain Control (VVA)	Control voltage range: 0-5V _{DC} ; Minimum Gain = 0V _{DC} , Maximum Gain = 5.0V _{DC}
FL3	Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-low)
E1	GND	Ground

OUTLINE DRAWING



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TYPICAL 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: 33dB, 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: P_{SAT} @ $P_{IN} = 1.0dBm$
 Reference: 33dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range

Top Curve: Max. Gain @ $VVA_{CTRL} = 5.0V$, $P_{IN} = -20dBm$
 Middle Curve: Min. Gain @ $VVA_{CTRL} = 2.4V$, $P_{IN} = -20dBm$
 Reference: 10dB, 10dB/div.
 Bottom Curve: Input Return Loss @ Minimum Gain
 Reference: 0dB, 10dB/div.

