HIGH GAIN, LOW CURRENT

Monolithic Amplifier

PSA-8A+

50Ω DC to 4 GHz

THE BIG DEAL

- Wideband, DC to 4 GHz
- High Gain, 31 dB typ. at 0.1GHz
- Low NF 3.0 dB typ. at 0.1GHz
- Low Current, 36 mA typ.
- Protected by US Patent 6,943,629



Generic photo used for illustration purposes only

CASE STYLE: CA1389

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

APPLICATIONS

- Cellular
- PCS
- Communication receivers & Transmitters
- Satellite communication
- Military

PRODUCT OVERVIEW

The PSA-8A+ is a HBT based wideband low noise MMIC Amplifier with high gain and low current. This design operates on a single 5V supply, is well matched for 50 Ohms and comes in a SOT-363 package, accommodating dense circuit board layouts.

KEY FEATURES

Feature	Advantages
High Gain, 31 dB typ. at 0.1GHz	Enables signal amplification without the need for multiple gain stages.
Low Noise, 3.0 dB typ. at 0.1GHz	Enables lower system noise figure performance. Low NF and High Gain results in lower NF systems
SOT-363 Package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

REV. A
ECO-011279
PSA-8A+
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ELECTRICAL SPECIFICATIONS[1] AT 25°C, ZO=50Ω

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range[4]		DC		4.0	GHz
Gain	0.01	26.7	30.8	36.2	dB
	0.1	26.9	31	36.4	
	1.0	22.1	25.4	29.9	
	2.0	17.5	20.1	23.6	
	3.0	—	15.6	—	
	4.0	—	11.2	—	
Input Return Loss	0.01		11		dB
	0.1		12		
	1.0		18		
	2.0		18		
	3.0		12		
	4.0		8		
Output Return Loss	0.01		20		dB
	0.1		19		
	1.0		7		
	2.0		9		
	3.0		16		
	4.0		9		
P1dB	0.01		12.1		dBm
	0.1		12.8		
	1.0		11.9		
	2.0		9.6		
	3.0		6.5		
	4.0		3.1		
OIP3 (Pout = -5dBm/Tone)	0.01		26.1		dBm
	0.1		25.8		
	1.0		23.2		
	2.0		20		
	3.0		16.2		
	4.0		11.3		
Noise Figure	0.01		3.1		dB
	0.1		3		
	1.0		3.7		
	2.0		4		
	3.0		4.4		
	4.0		4.8		
Supply Voltage (Vs)	DC	4.75	5	5.25	V
Device Operating Current (Is)	DC		36	39	mA
Device Current Variation vs. Voltage[2]			0.024		mA/mV
Device Current Variation vs. Temperature[3]			7.7		µA/°C
Thermal Resistance, Junction to ground lead			140		°C/W

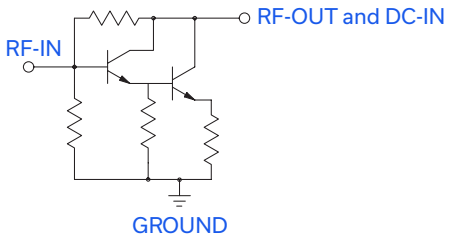
1. Measured on Mini-Circuits Characterization Test Board TB-PSA-8A+. See Characterization Test Circuit (Fig. 1)
2. Device Current Variation vs. Voltage = (Current at 5.25V - Current at 4.75V)/(5.25V-4.75V)*1000)
3. Device Current Variation vs. Temperature = (Current at 85°C - Current at -45°C)/130
4. Guaranteed specifications DC to 4 GHz. Low frequency cut-off determined by external coupling capacitor.

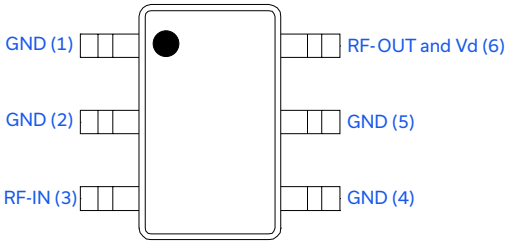
MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Input Power (CW)	13 dBm
Operating Current on Pin 6	65mA

5.Permanent damage may occur if any of these limits are exceeded. Electrical Maximum rating are not intended for continuous normal operation.

SIMPLIFIED SCHEMATIC AND PIN DESCRIPTION





Function	Pin Number	Description (See Application Circuit, Fig. 1)
RF-IN	3	RF input pin (connect to RF-IN via C1)
RF-OUT & DC-IN	6	RF output pin (connected to RF-OUT via blocking cap C2 and supply voltage VDD via RF Choke (CHK) & Resistor R1)
GND	1,2,4,5	Connections to ground

CHARACTERIZATION TEST / APPLICATION CIRCUIT

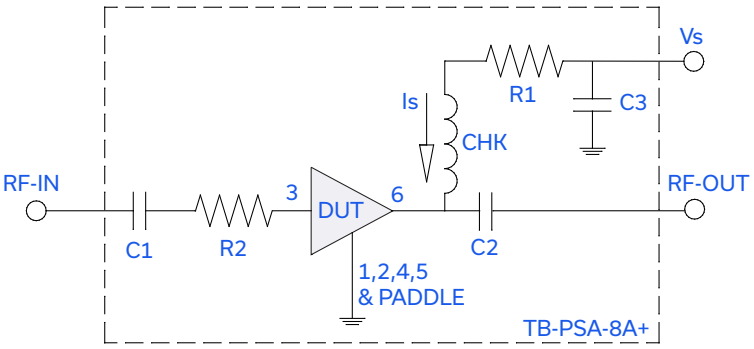
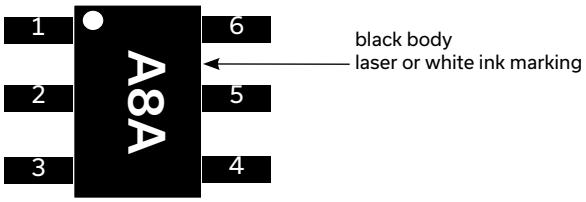


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization Test Board TB-PSA-8A+) Gain, Return loss, Output power at 1dB compression (P1 dB), Output IP3 (OIP3) and Noise Figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:
1. Gain: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -5 dBm/tone at output.

Component	Size	Value	Part Number	Manufacturer
DUT	SOT-363	--	PSA-8A+	MCL
C1,C2	0402	2400pF	GRM155R71H-242JA01D	Murata
C3	0603	0.1uF	GCJ188R71H-104KA12D	Murata
R1	0805	36.5Ohms	RK73H2ATTD36R5F	KOA
CHK	0.15x0.15	--	TCCH-80+	MCL
R2	402	10Ohms	RK73H1ETTP10R0F	KOA

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

Monolithic Amplifier PSA-8A+

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	CA1389 Plastic molded SOT-363 package, lead finishi: Matte-Tin
Tape & Reel **Standard quantities available on reel**	F101 7" reels with 20, 50, 100, 200, 500, 1K, or 2K devices
Suggested Layout for PCB Design	PL-643
Evaluation Board	TB-PSA-8A+
Environmental Ratings	ENV08T2

ESD RATING

Human Body Model (HBM): Class 1B (500 v to < 1,000 v) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (< 100 v) in accordance with ANSI/ESD STM 5.2 - 1999

MSL TEST FLOW CHART

