E-pHEMT MMIC

AE607

Product Features

- 5 ~ 1000MHz
- High Gain
- High linearity
- SOIC-8 SMD Type package
- Higher productivity
- Lower manufacturing cost
- Low Noise Figure
- -63dBc CSO 79 Channels @ +40dBmV/ch
- -65dBc CTB 79 Channels @ +40dBmV/ch

Applications

- Low Noise Amplifier for CATV, Satellite
- Cable Modem
- FTTH (G-PON, GE-PON)
- Optical node

Package Type : SOIC-8

Description

AE607 is designed as low cost drive amplifiers for many applications including FTTH, CATV System.
This MMIC is based on Gallium Arsenide Enhancement Mode pHEMT which shows low current draw and very low noise.
The data in this spec sheet is valid only for 75ohm application. 50ohm data is in a separate spec sheet.

Electrical Specifications

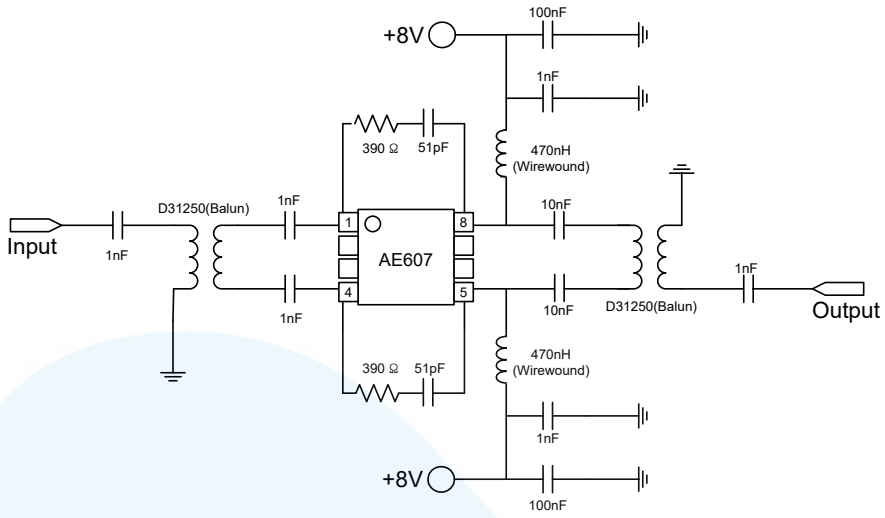
PARAMETER		UNIT	MIN	TYP	MAX	CONDITION
Frequency		MHz	5	-	1500	-
Gain		dB	10.5	12.5	-	30 ~ 1000MHz
Gain Flatness		dB	-	0.8	-	30 ~ 1000MHz
Input Return Loss		dB	-	-15	-	-
Output Return Loss		dB	-	-15	-	-
Output IP3		dBm	40	43	-	@ 500MHz/10dBm 2tone
1dB Compression Point		dBm	25	28	-	@ 500MHz
Noise Figure		dB	-	3.5	-	30 ~ 1000MHz
CTB	**30 ~ 1004MHz**	dBc	-	-69	-64	79 channel, +40dBmV/ch
CSO		dBc	-	-70	-65	
DC Current		mA	-	240	-	Vdd = 8.0V

Note
1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25℃, Vdd=8V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +10dBm/tone separated by 1MHz, Test Freq = 500MHz

Absolute Maximum Ratings

PARAMETER	UNIT	MIN	TYP	MAX
Device Voltage	VDC	-	8	12
Operating Temperature	℃	-40	-	85
Storage Temperature	℃	-40	-	150
ESD Human Body Model	-	-	Class 1B	-
Moisture Sensitivity Level	-	-	MSL1	-
Junction Temperature (Tj)	℃	-	-	180
Thermal Resistance (Rth)	℃/W	-	30	-

Application Circuit @ 30 ~ 1000MHz, 75ohm System, VDD=8V

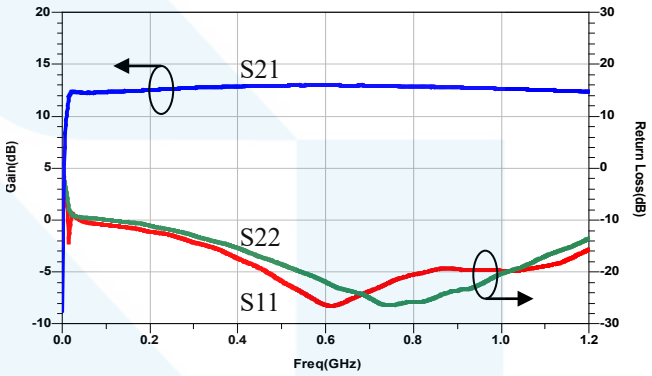


Typical Performance @ VDD=8V, IDS=240mA, T=25℃, 75ohm System

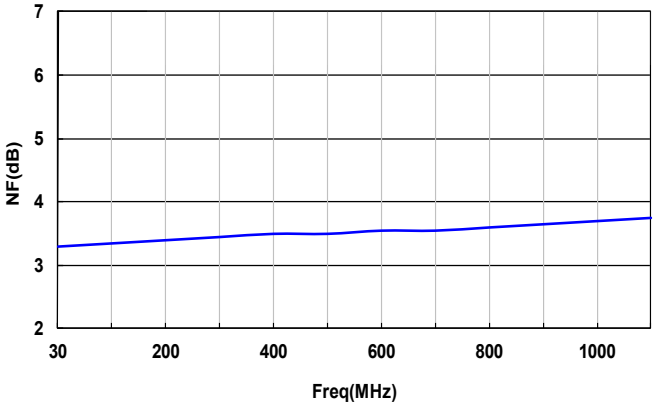
PARAMETER	Units	Typical		
Frequency	MHz	30	500	1000
Gain(S21)	dB	12.3	12.9	12.2
Input Return Loss(S11)	dB	-10.2	-21.8	-19.7
Output Return Loss(S22)	dB	-9.5	-18.5	-20.3
Output IP3	dBm	41.5	43.5	39.5
1dB Compression Point	dBm	26.1	28.4	26.8
Noise Figure	dB	3.5	3.5	3.7
CSO*	dBc	-69		
CTB*	dBc	-70		
Current	mA	240		

* 79channels_Flat, +40dBmV

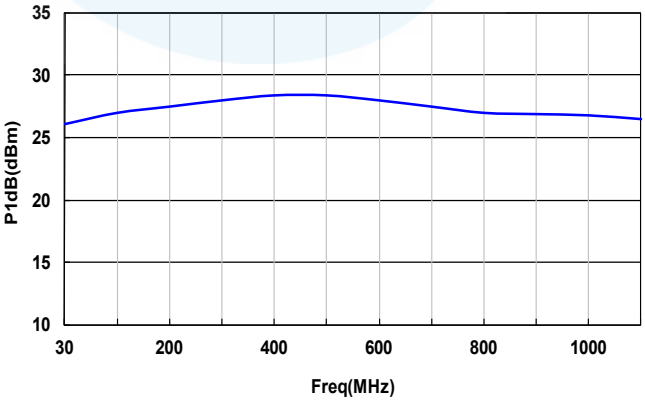
S-Parameter



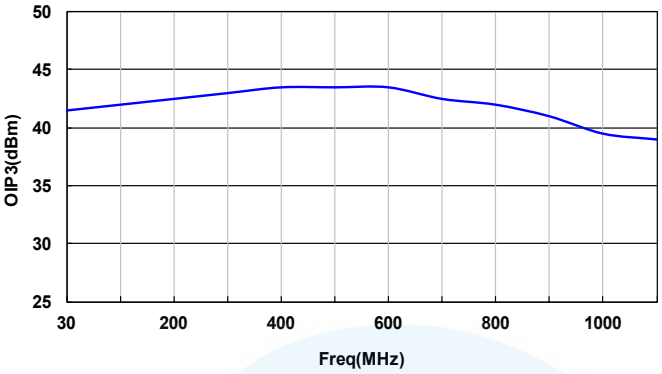
Frequency vs. Noise Figure



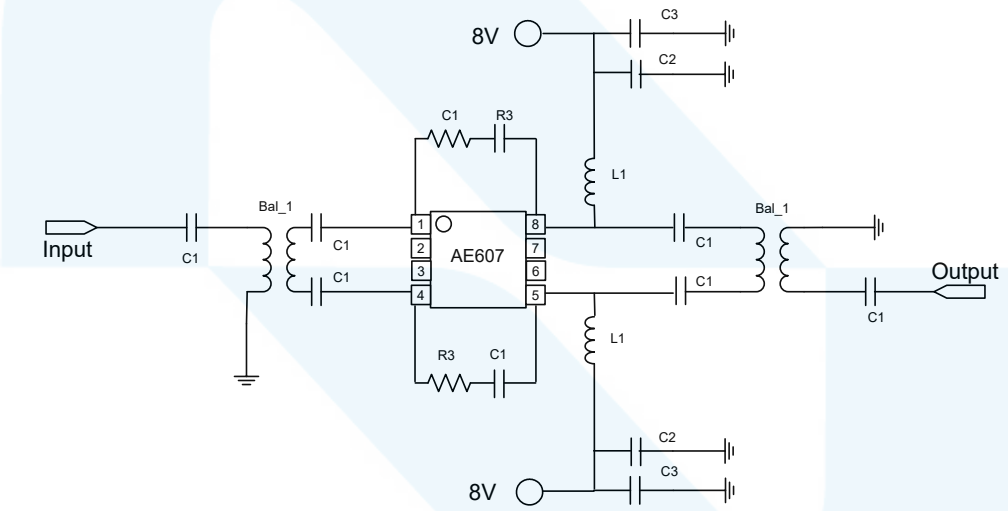
Frequency vs. P1dB



Frequency vs. OIP3



Application Circuit @ 30~1000MHz

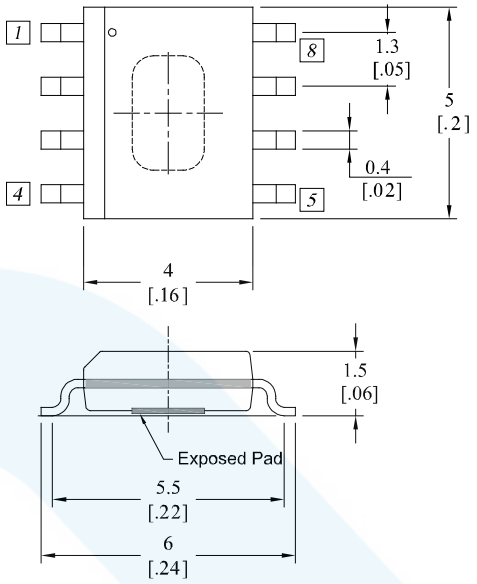


Evaluation Part List @ 30~1000MHz

Location	Model No.	Spec.	Maker	Quantity
C1	GRM188R71H103KA01D	10nF	Murata	10
C2	GRM188R71C104KA01D	100nF	Murata	2
C3	TAJA475M016RNJ, 4.7uF	4.7uF	AVX	2
R1	MCR06 EZPJ102~302	1K~3KΩ	ROHM	2
R2	MCR03 EZPJ271	270Ω	ROHM	2
R3	MCR03 EZPJ201	200Ω	ROHM	2
R4	MCR10 EZHJ100 (>0.25W)	10Ω	ROHM	4
L1	LEM2520TR56K	560nH	Taiyo-yuden	2
BAL_1	D60465A	2.5T	LS Comm.	2

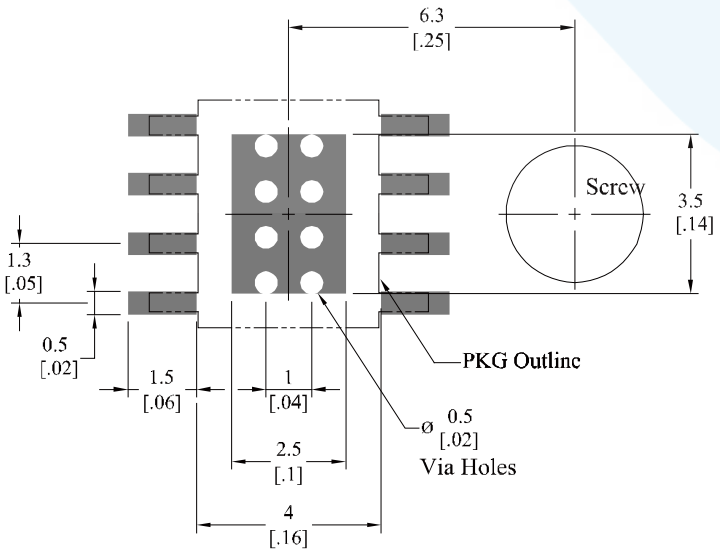
Package Dimensions (Type: SOIC-8)

* Unit: mm[inch] | Tolerance ±0.2[.008]



Pin Description			
Pin No	**Function**	**Pin No**	**Function**
1	RF IN(2)	5	RF OUT(1)
2	GND	6	GND
3	GND	7	GND
4	RF IN(1)	8	RF OUT(2)

Recommended Pattern



Mounting Configuration Notes

1. Ground / thermal via holes are critical for the proper performance of this device.
2. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
3. Mounting screws can be added near the part to fasten the board to a heat sink. Ensure that the ground / thermal via hole region contacts the heat sink.
4. Do not put solder mask on the backside of the PCB in the region where the board contacts the heat sink.
5. RF trace width depends upon the PCB material and construction.
6. Use 1 oz. Copper minimum.

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
AE607	2014.04.18	1.1	Thermal Resistance	-
AE607	2012.10.10	1.0	Document revision	-

Certification

This product is manufactured by a company that is certified for the AS9100D quality management system.