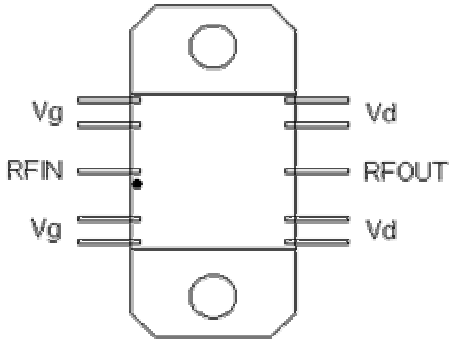
5 – 6 GHz 2 Watt Power Amplifier

Features

- **Frequency Range : 5 – 6GHz**
- **32 dBm output P1dB**
- **24.5 dB Power gain**
- **28% PAE**
- **High IP3**
- **Input Return Loss > 8 dB**
- **Output Return Loss > 12 dB**
- **Dual bias operation**
- **No external matching required**
- **DC decoupled input and output**
- **0.5 µm InGaAs pHEMT Technology**
- **SMT Metal Ceramic Package**

Functional Diagram



Typical Applications

- **RADAR**
- **Military & space**
- **LMDS, VSAT**

Description

The AMT2134021P is a C-band Power amplifier with 32dBm output P1dB. The PA uses 2 stages of amplification and operates in 5 – 6 GHz frequency range. The PA features 25 dB of gain with input and output return losses of 8 dB and 12 dB respectively. The PA has a high IP3 of 43dBm and 28% PAE. This feature enables it to be used in the applications requiring efficiency along with linearity. The chip operates with dual bias supply voltage.

The package used is a SMD Metal Ceramic Package with base metal made up of copper composite.

Absolute Maximum Ratings (1)

Parameter	Absolute Maximum	Units
Drain bias voltage (Vd)	+10	volts
Drain current (Id)	1	A
RF input power (RFin at Vd=9V)	26	dBm
Operating temperature	-50 to +85	^{o}C
Storage Temperature	-65 to +150	^{o}C

1. Operation beyond these limits may cause permanent damage to the component

Electrical Specifications [1] @ T_A = 25 °C, V_d = 8V, V_g = -1V, Z_o =50 Ω

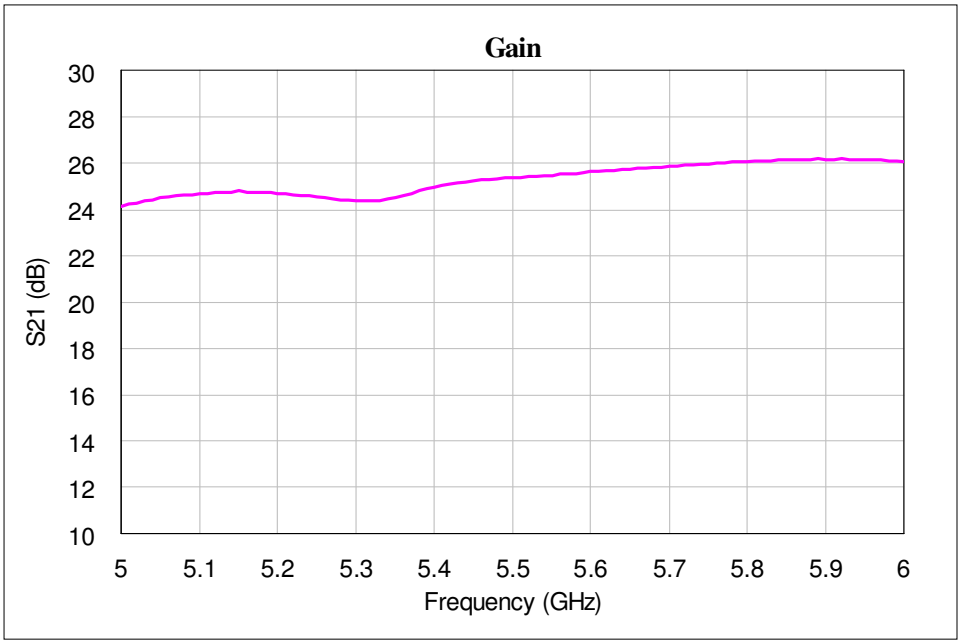
Parameter	Typ.	Units
Frequency Range	5 – 6	GHz
Gain	24.5	dB
Gain Flatness	+/-0.5	dB
Output Power (P1 dB)	32	dBm
Input Return Loss	8	dB
Output Return Loss	12	dB
Saturated output power (Psat)	33	dBm
Output Third Order Intercept (IP3)	43	dBm
Power Added Efficiency (PAE)	28%	--
Supply Current (I_{dq})	800	mA
Supply Current (I_{dsat} [2])	950	mA

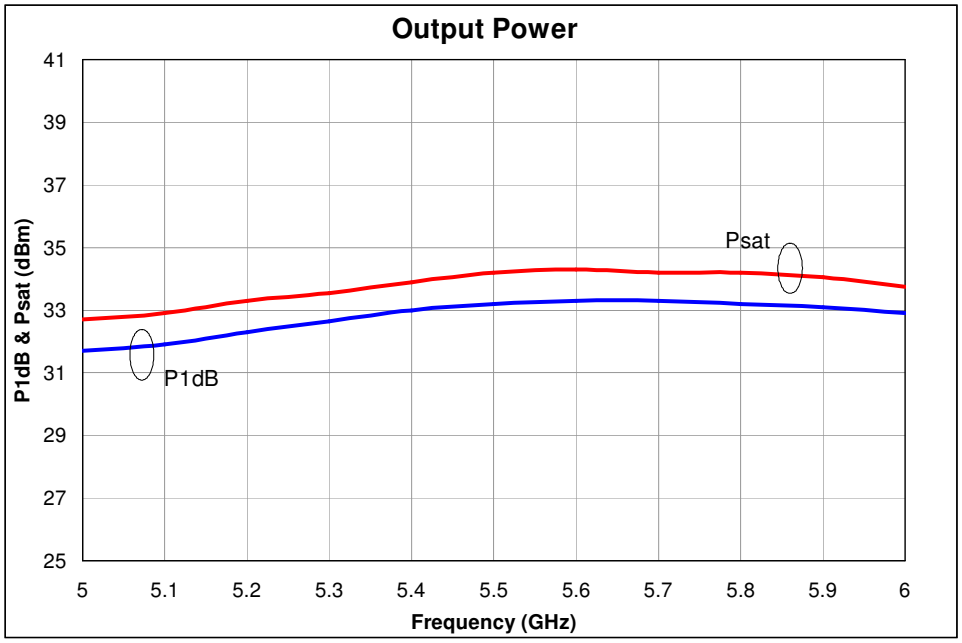
Note:

1. Electrical specifications as measured in test fixture.
2. Idsat is the maximum current under input RF drive.

Test fixture data

V_d = 8V, V_g = -1V, Total Current =800mA, T_A = 25 °C





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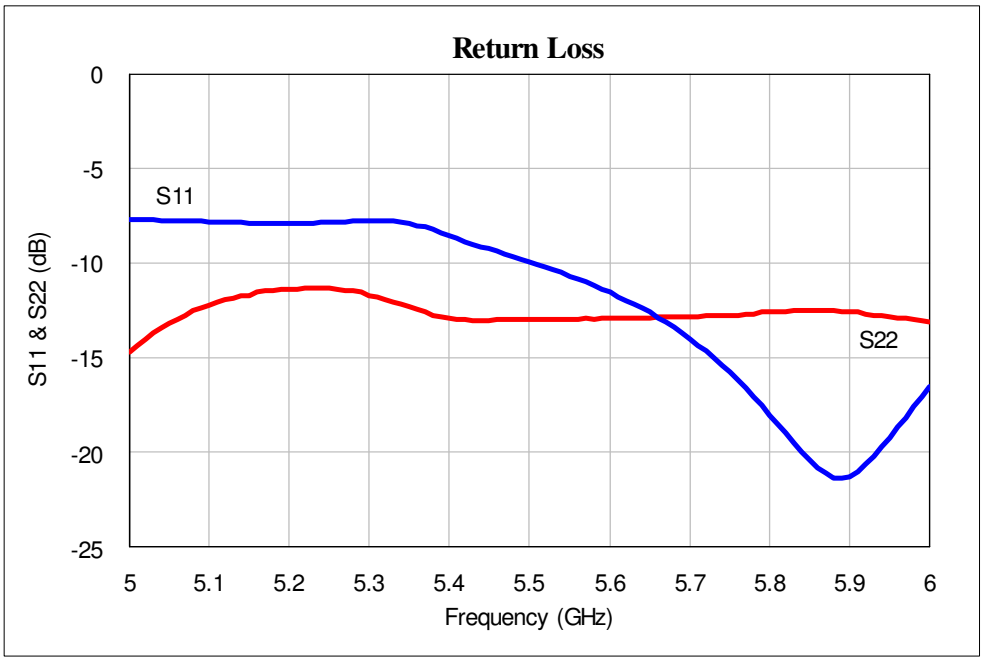
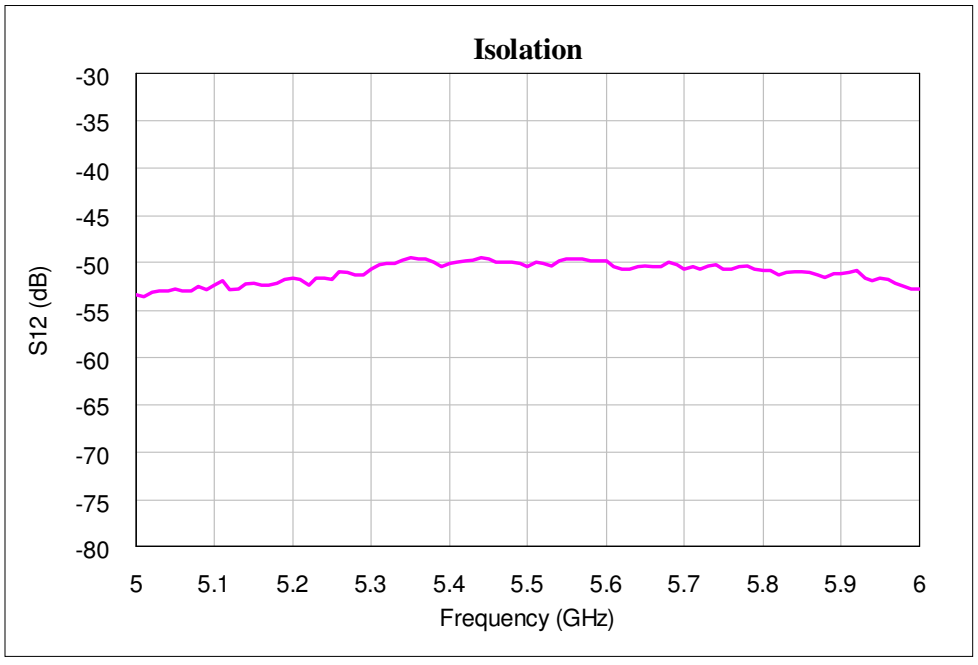
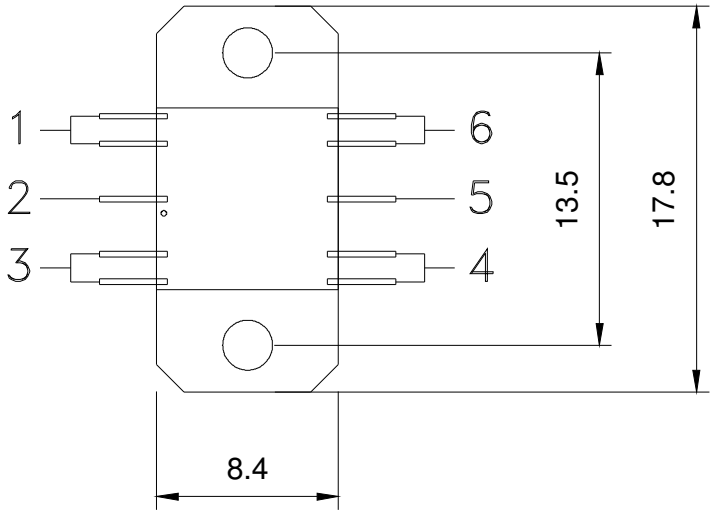




Pin details

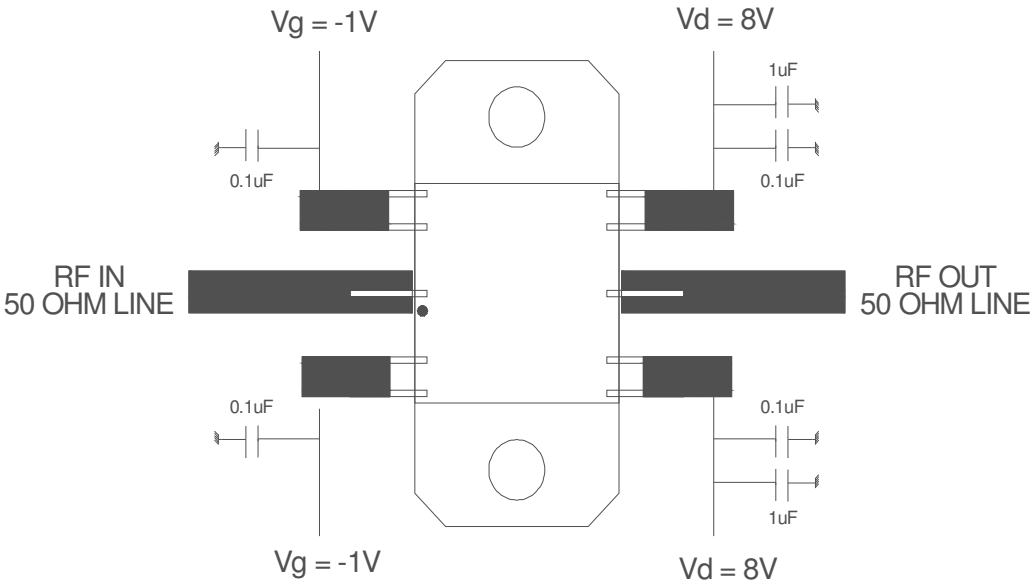


Units: millimeters

Note:

1. Pad no. 2 : RF IN
2. Pad no. 1,3 : Vg
3. Pad no. 6,4 : Vd
4. Pad no. 5 : RF OUT

Recommended Assembly Diagram



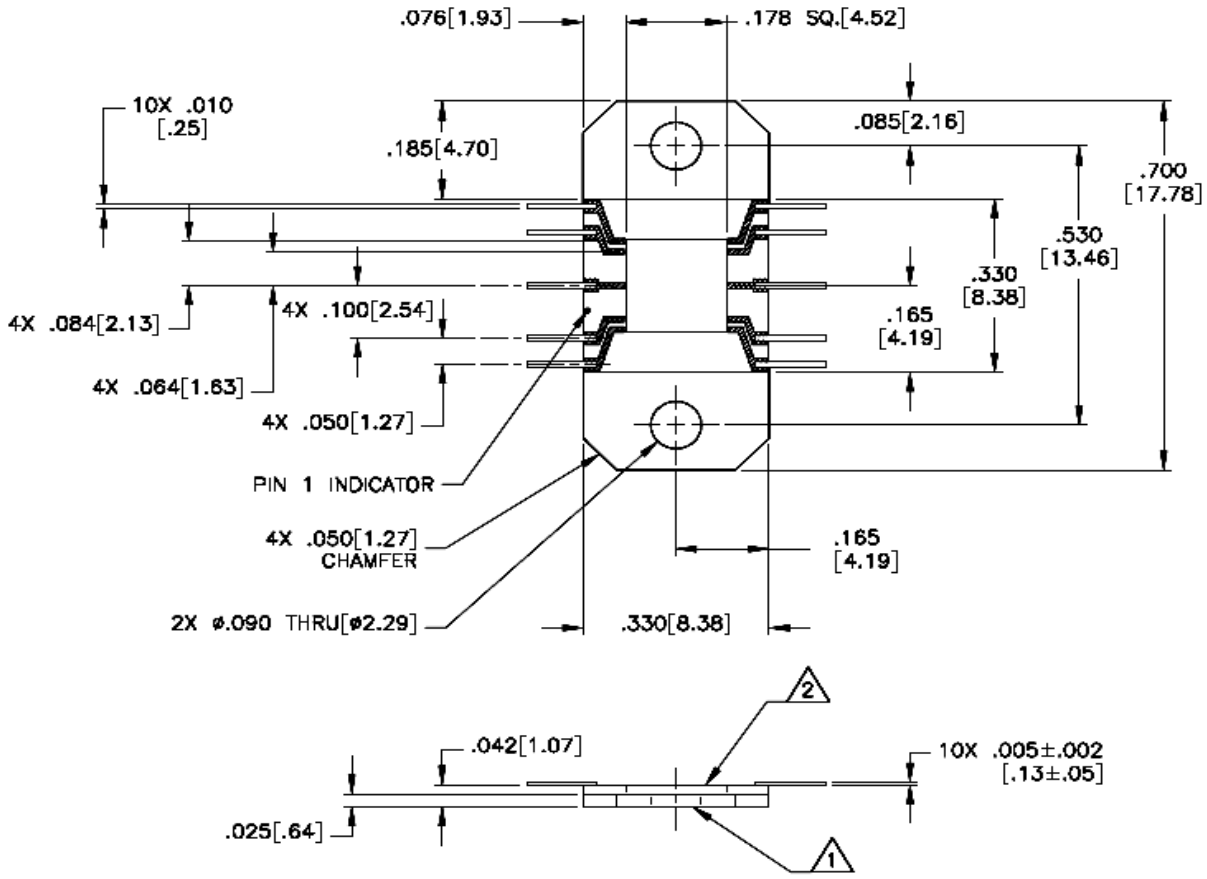
Note :

1. Input and output 50 ohm lines are on 5 mil RT Duroid substrate
2. 0.1 µF and 1µF capacitors may be additionally used as a second level of bypass for reliable operation
3. The RF input & output ports are DC decoupled on-chip.
4. Proper heat sink like Alluminium or copper to be used for better reliability of package

Die attach: For Epoxy attachment, use of a two-component conductive epoxy is recommended. An epoxy fillet should be visible around the total die periphery. If Eutectic attachment is preferred, use of fluxless AuSn (80/20) 1-2 mil thick preform solder is recommended. Use of AuGe preform should be strictly avoided.

Wire bonding: For DC pad connections use either ball or wedge bonds. For best RF performance, use of 150 - 200µm length of wedge bonds is advised. Single Ball bonds of 250-300µm though acceptable, may cause a deviation in RF performance.

Package Outline Diagram



Units: Inches [mm]

GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing

All information and Specifications are subject to change without prior notice