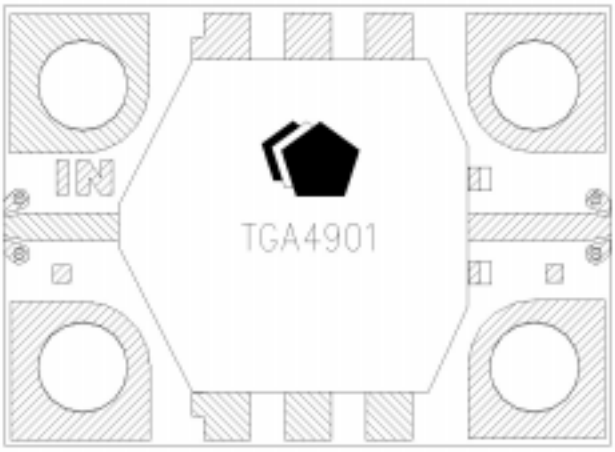
TriQuint Recommends the TGA4905-EPU-CP be used for New Designs

3 Watt Ka Band Packaged Amplifier TGA4901-EPU-CP



Key Features and Performance

- 34.8 dBm Midband Psat
- 24 dB Nominal Gain
- 8 dB Typical Input Return Loss
- 12 dB Typical Output Return Loss
- 25 - 31 GHz Frequency Range
- 0.25µm pHEMT Technology
- Bias Conditions: 6V, 2.2A
- Package Dimensions:
  13.34 x 9.65 x 1.85 mm
  (0.525 x 0.380 x 0.073 in)

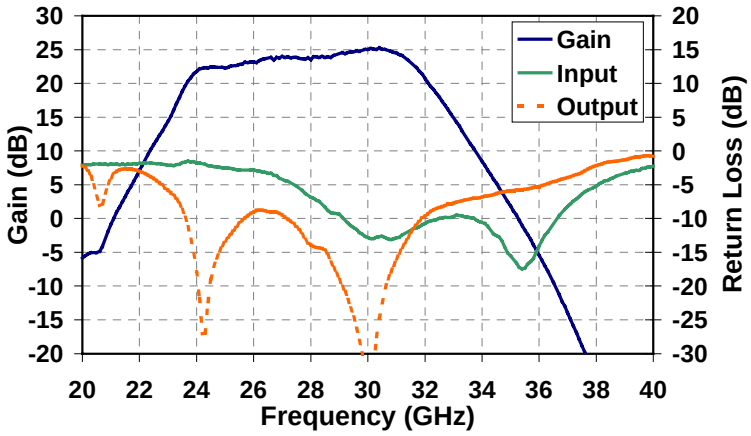
Primary Applications

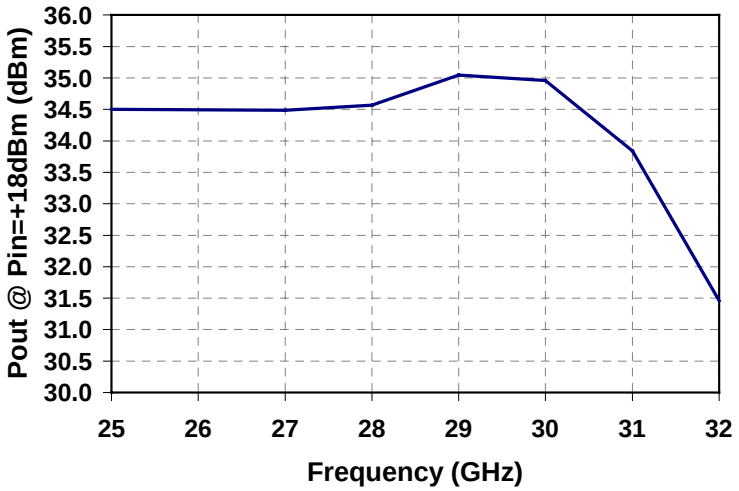
- Satellite Ground Terminal
- Point to Point

Preliminary Measured Performance

Bias Conditions: Vd=6V Idq=2.2A

TGA4901 S-Parameters





Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

TABLE I
MAXIMUM RATINGS

Symbol	Parameter 1/	Value	Notes
V_D	Drain Voltage	8 V	2/
V_G	Gate Voltage Range	-5V to 0V	
I_D	Drain Current (Quiescent)	3.0 A	2/
$\| I_G \|$	Gate Current	62 mA	
P_{IN}	Input Continuous Wave Power	24 dBm	2/
P_D	Power Dissipation	16.8 W	2/ 3/
T_{CH}	Operating Channel Temperature	150 ^{0}C	4/ 5/
T_M	Mounting Temperature (30 Seconds)	320 ^{0}C	
T_{STG}	Storage Temperature	-65 to 150 ^{0}C	

1/ These ratings represent the maximum operable values for this device.

2/ Combinations of supply voltage, supply current, input power, and output power shall not exceed P_D.

3/ P_D is the power dissipation allowed in order to reach a channel temperature of 150°C with a package base temperature of 70°C. When operated at this power dissipation with a baseplate temperature of 70°C, the MTTF is reduced from 5.3E+6 to 1.0E+6 hours.

4/ These ratings apply to each individual FET.

5/ Junction operating temperature will directly affect the device median time to failure (T_M). For maximum life, it is recommended that junction temperatures be maintained at the lowest possible levels.

Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

TABLE II
RF CHARACTERIZATION TABLE
(T_A = 25°C, Nominal)
(Vd = 6V, Idq = 2.2A ±5%)

SYMBOL	PARAMETER	TEST CONDITION	LIMITS TYPICAL	UNITS
Gain	Small Signal Gain	F = 25 – 31GHz	24	dB
IRL	Input Return Loss	F = 25 – 31GHz	8	dB
ORL	Output Return Loss	F = 25 – 31GHz	12	dB
PWR	Output Power @ Pin = +18dBm	F = 25 – 31GHz	34.5	dBm

TABLE III
THERMAL INFORMATION*

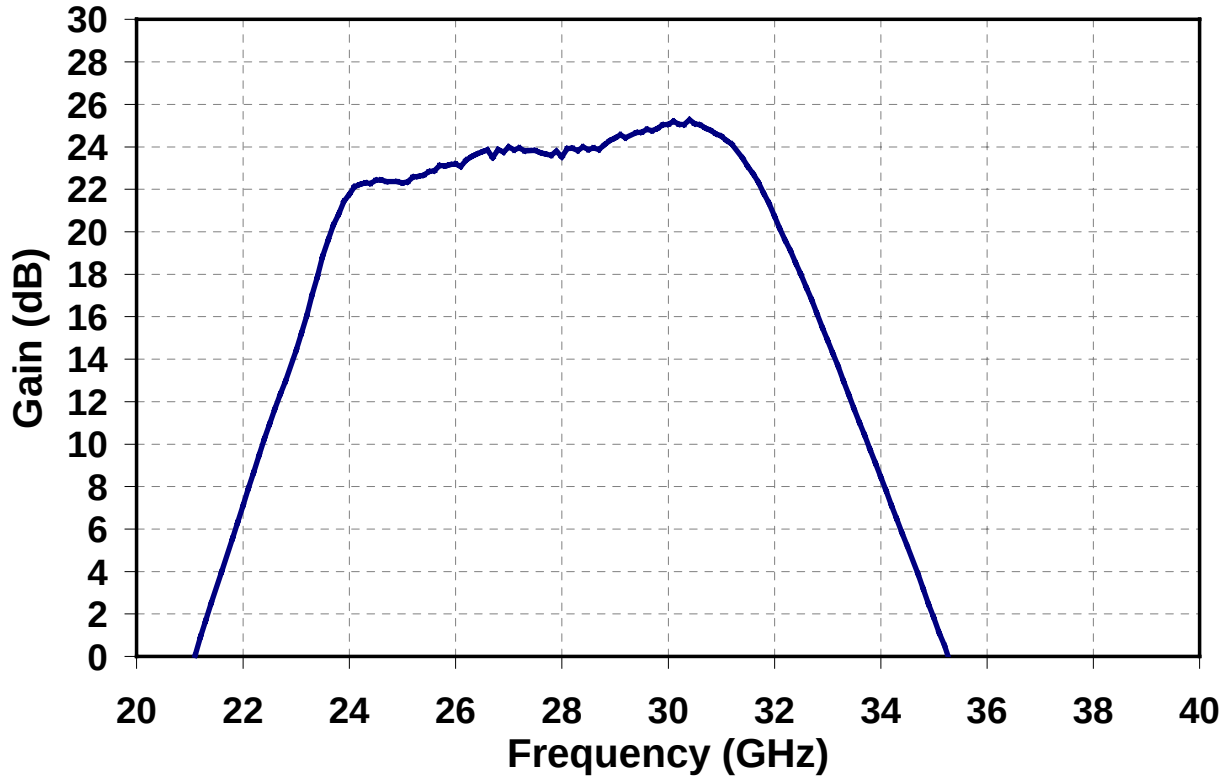
Parameter	Test Conditions	T_{CH} (°C)	$R_{\Theta JC}$ (°C/W)	T_M (hrs)
$R_{\Theta JC}$ Thermal Resistance (Channel to Backside of Package)	V_D = 6V I_D = 2.2A P_{DISS} = 13.2W	131.33	4.65	5.3E+6

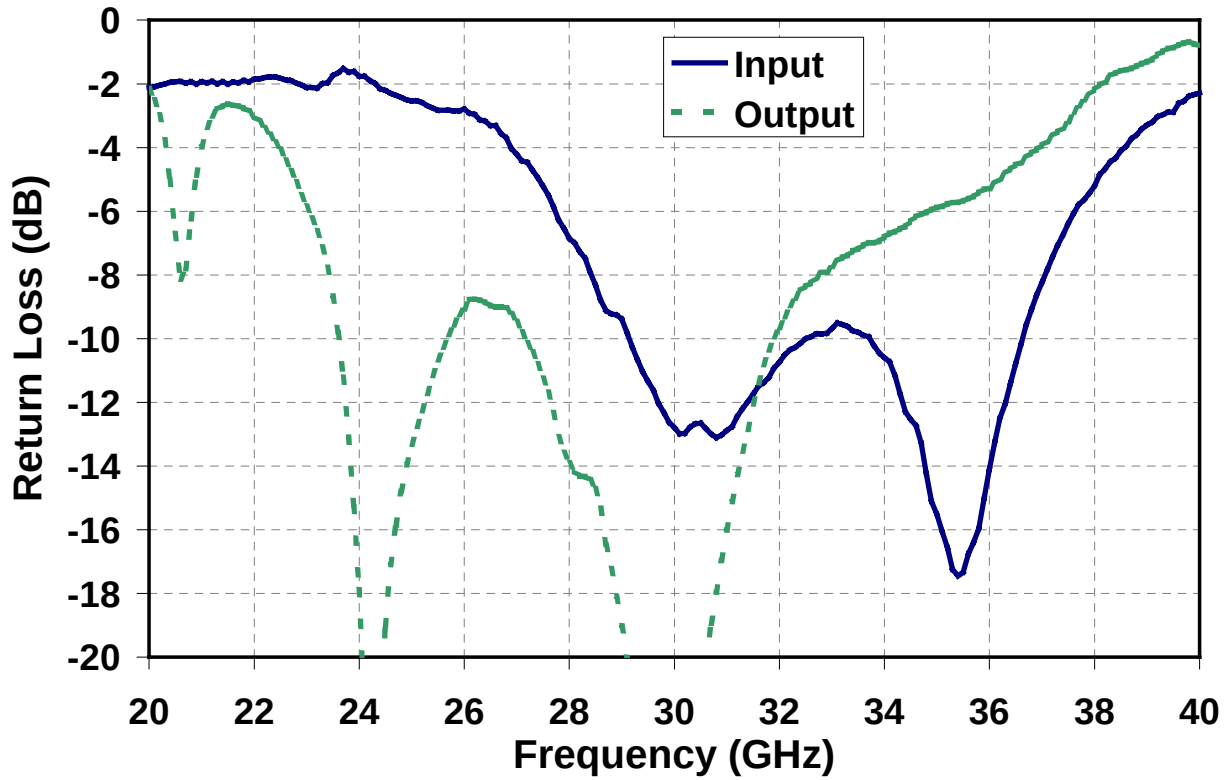
* The thermal information is a result of a detailed thermal model

Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

Typical Performance

V_D = 6V I_{Dq} = 2.2A

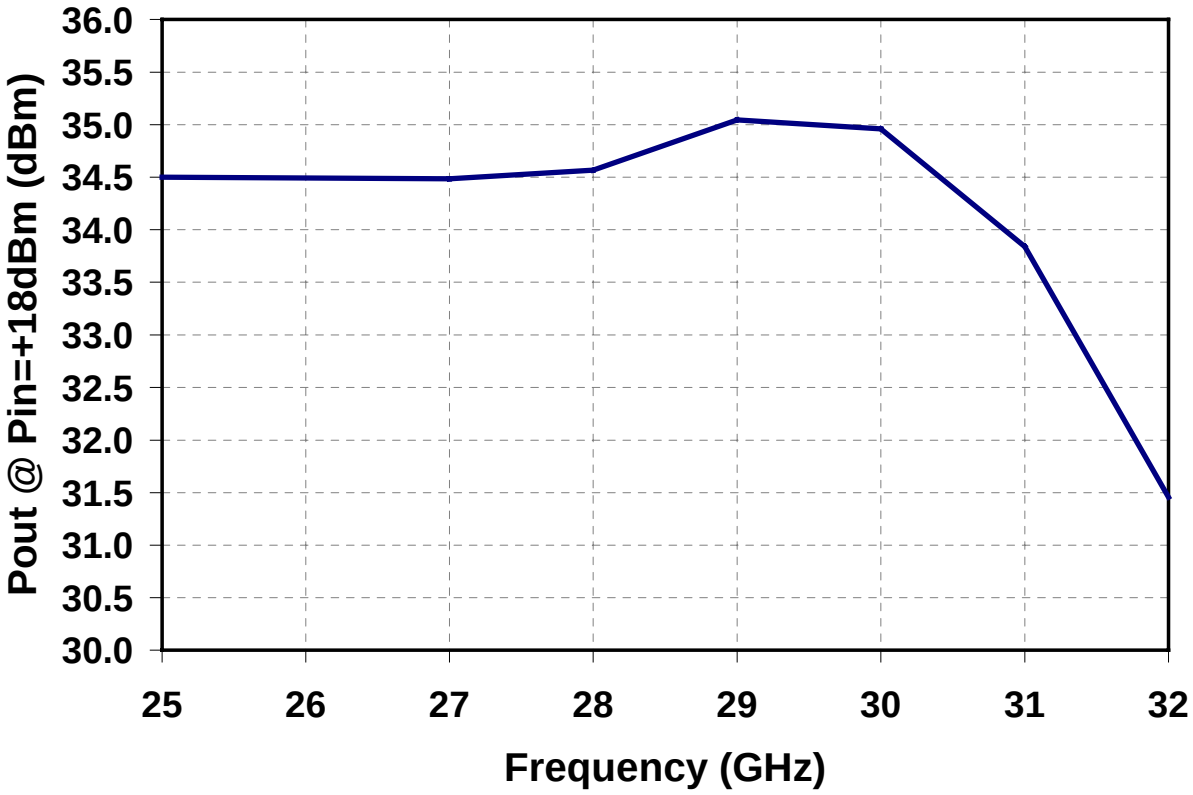




Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

Typical Performance

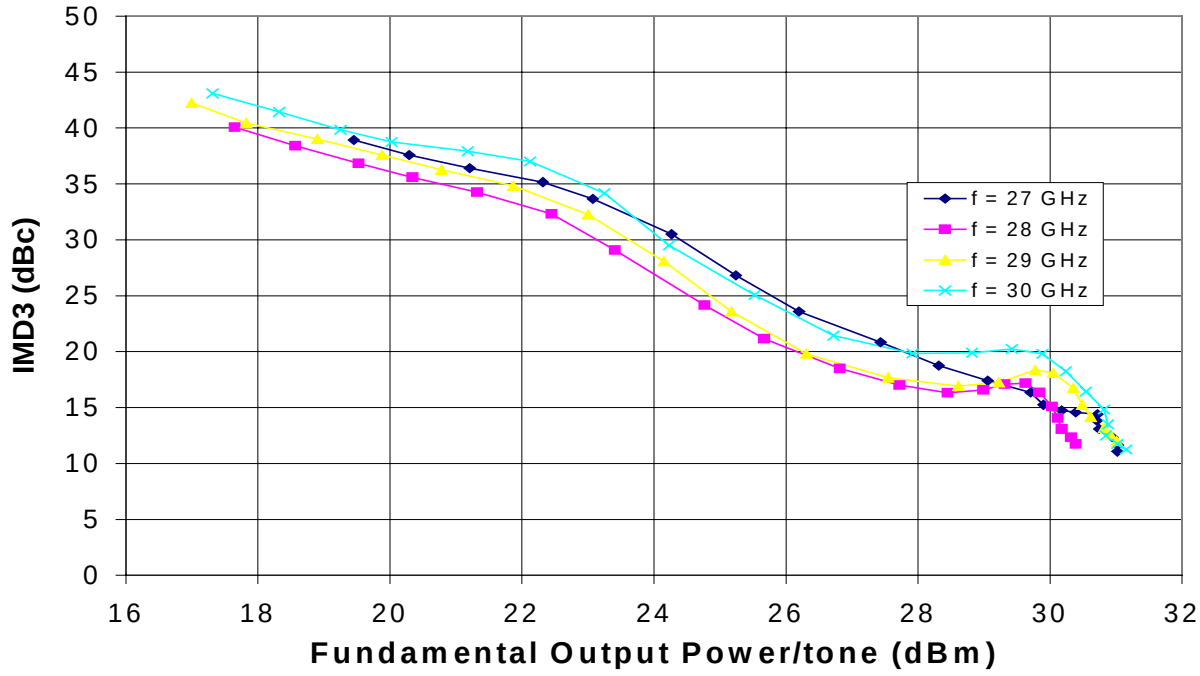
V_D = 6V I_{Dq} = 2.2A

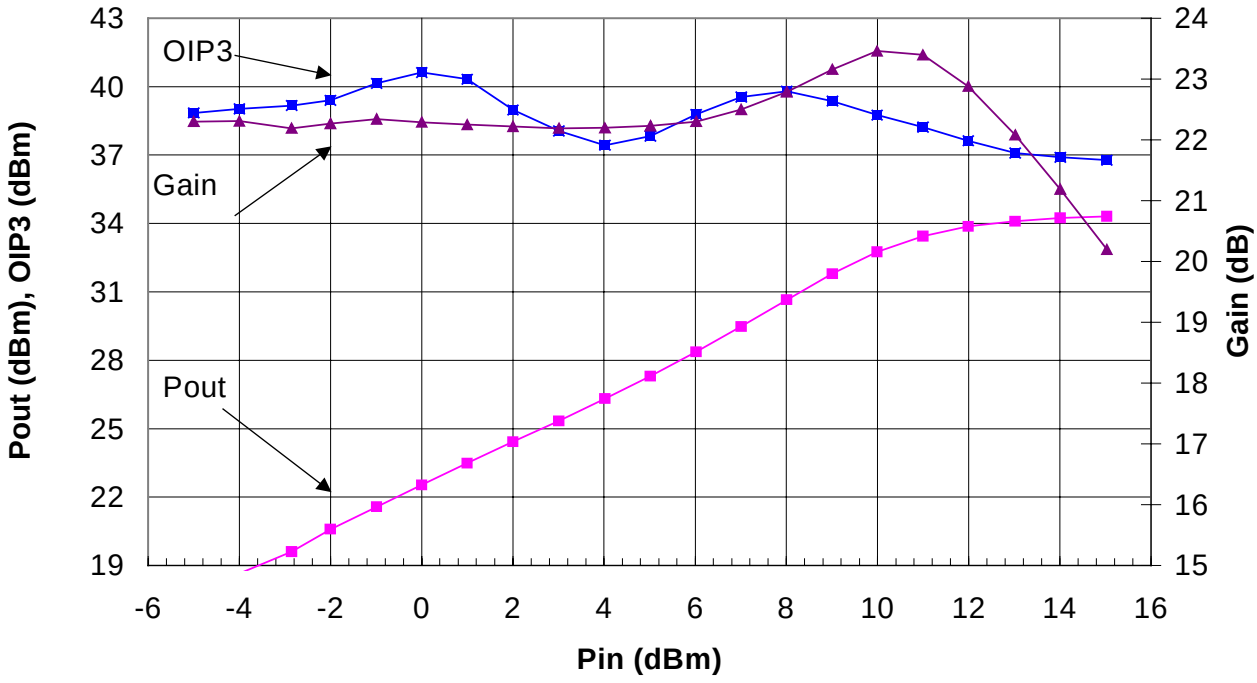


Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

Typical Performance

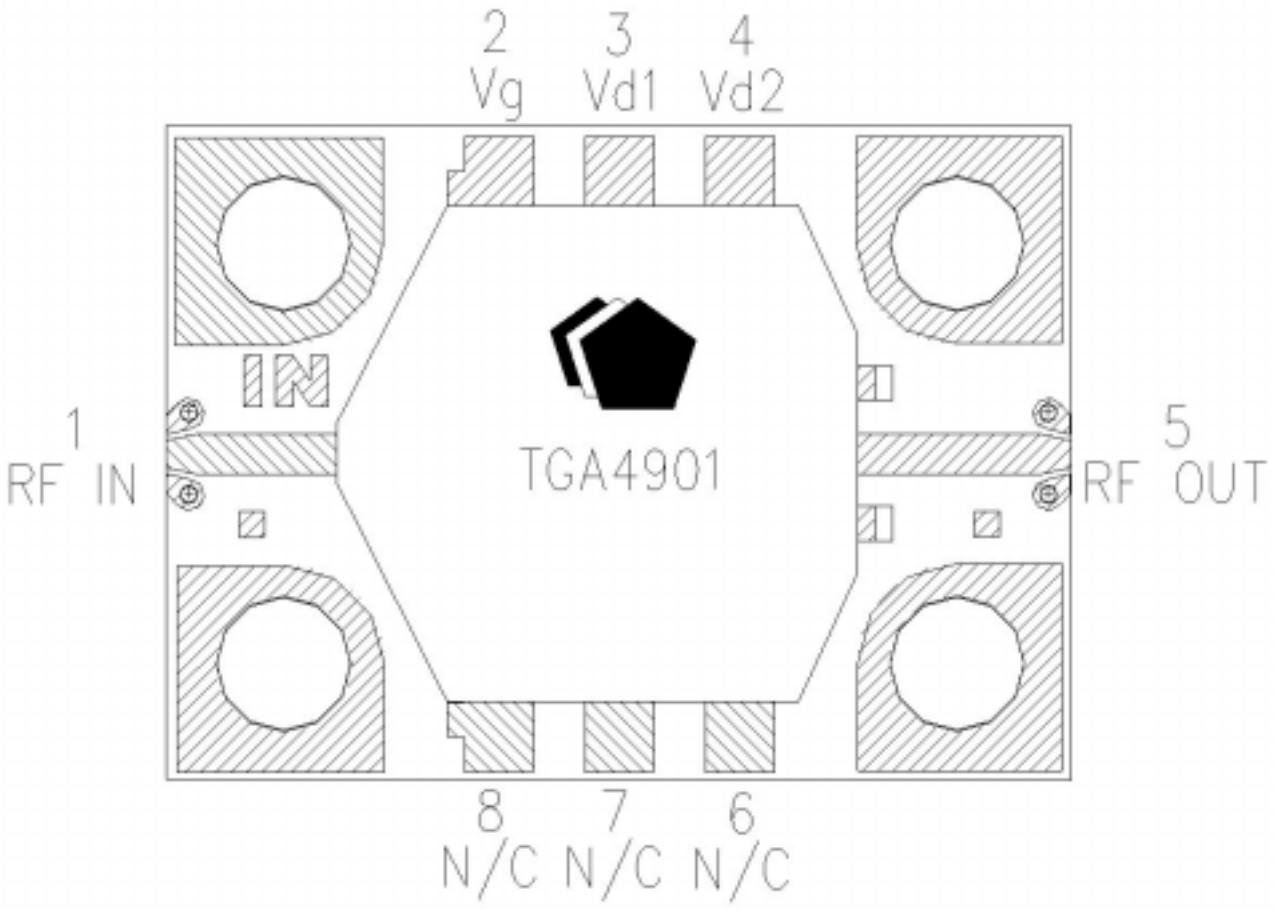
V_D = 6V I_{Dq} = 2.2A
(Data reflects die level performance)





Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

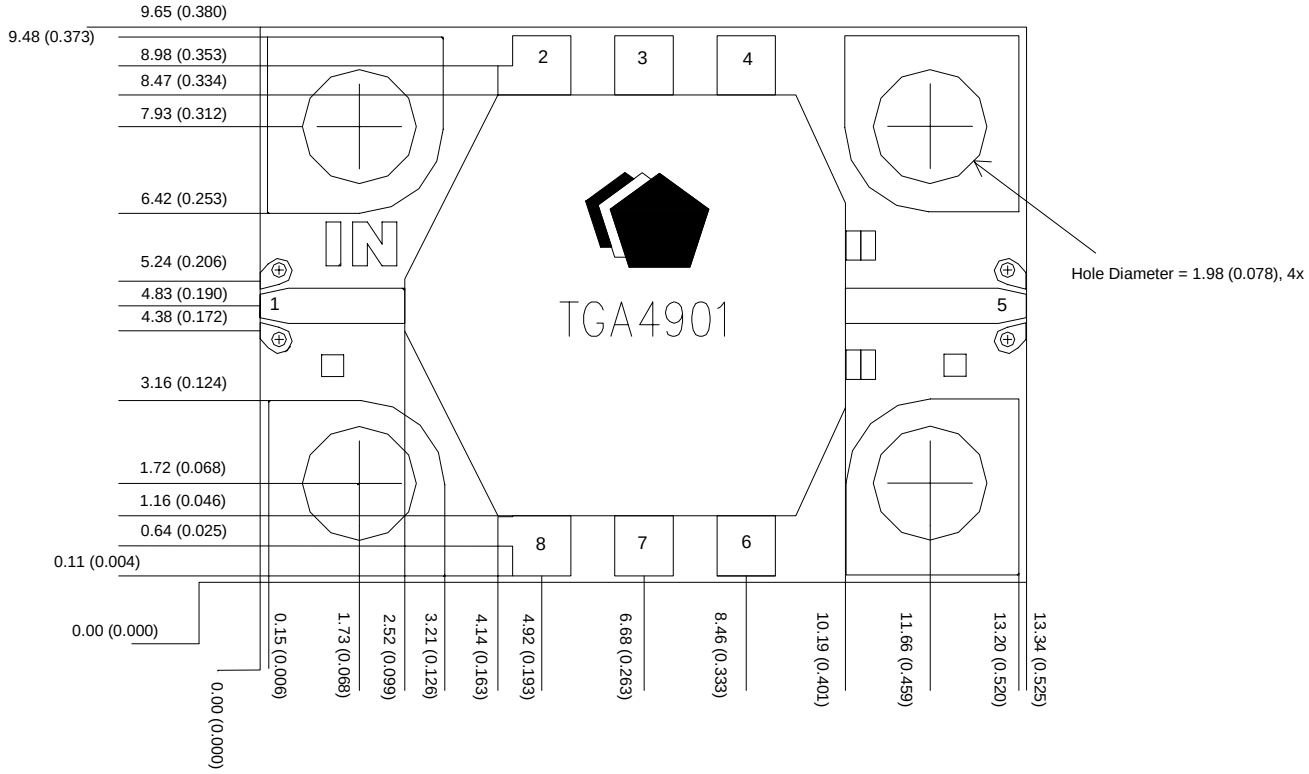
Package Pinout Diagram



GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

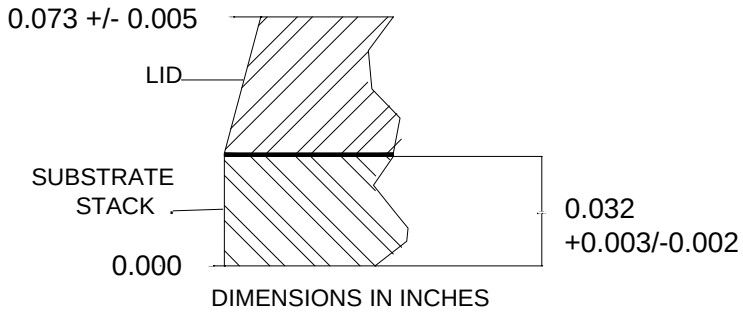
Mechanical Drawing



Units: millimeters (inches) Tolerance: +/-0.08 (0.003)
RF Ground through Backside

Bond Pad #1 (RF Input)	2.03 x 0.57	(0.080 x 0.022)
Bond Pad #2 (Vg)	1.02 x 1.03	(0.044 x 0.040)
Bond Pad #3 (Vd1)	1.02 x 1.03	(0.044 x 0.040)
Bond Pad #4 (Vd2)	1.02 x 1.03	(0.044 x 0.040)
Bond Pad #5 (RF Output)	2.66 x 0.61	(0.105 x 0.240)
Bond Pad #6 (N/C)	1.02 x 1.05	(0.044 x 0.041)
Bond Pad #7 (N/C)	1.02 x 1.05	(0.044 x 0.041)
Bond Pad #8 (N/C)	1.02 x 1.05	(0.044 x 0.041)

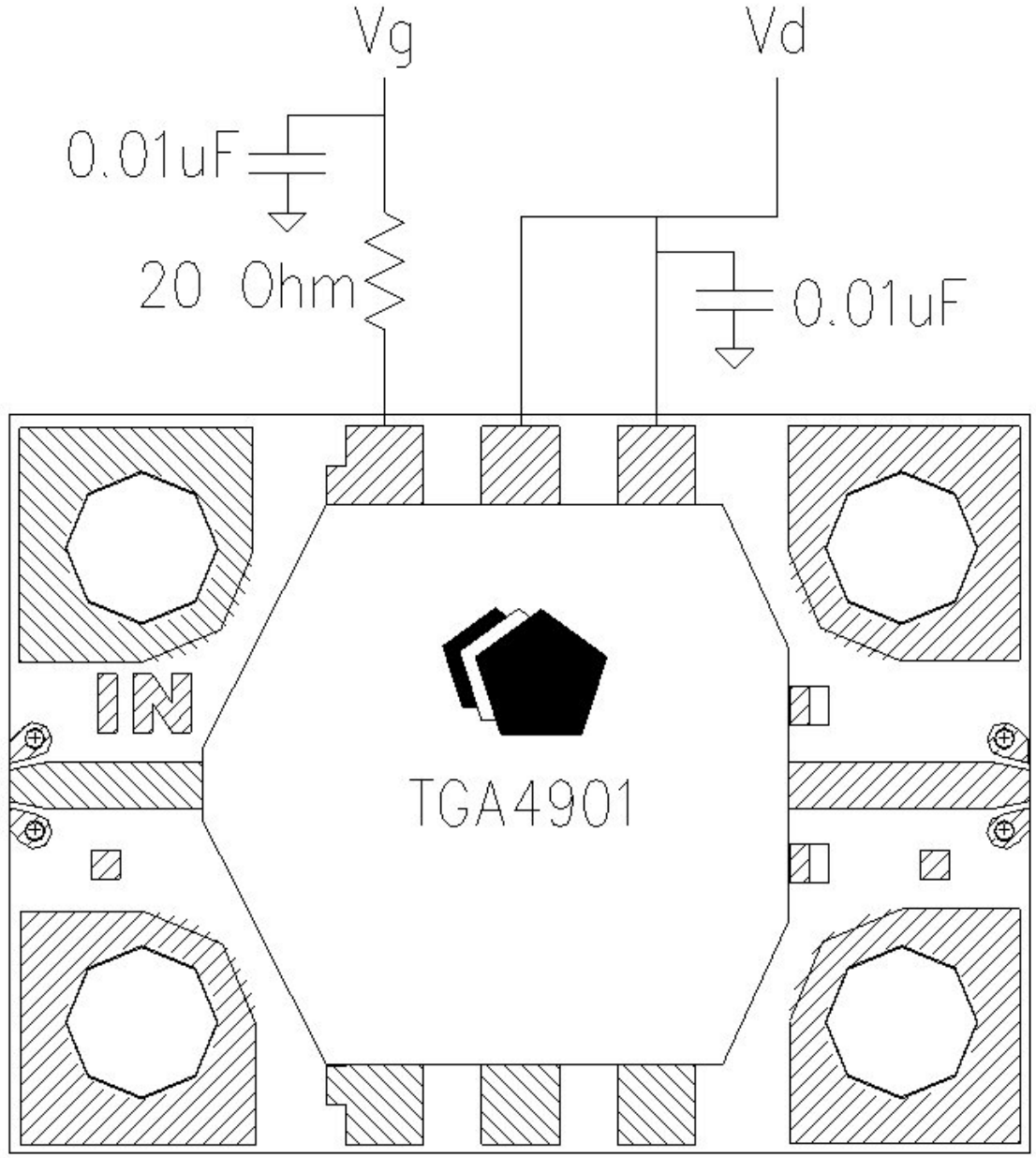
Top View



Side View

Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

Bias Schematic



WHEN USING 1 MIL DIAMETER BONDWIRES, IT IS RECOMMENDED AND A MINIMUM THAT 2 WIRES BE USED FOR THE RF INPUT, RF OUTPUT, VG & VD1. IT IS RECOMMENDED THAT 6 BONDWIRES BE USED FOR VD2, MINIMUM OF 4.

Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.

ORDERING INFORMATION

PART	PACKAGE STYLE
TGA4901-EPU-CP	CARRIER PLATE

Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.