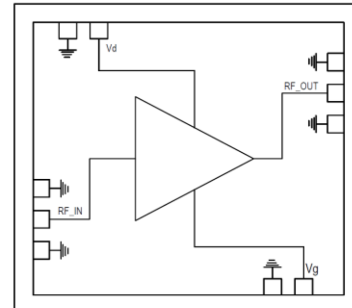
1.5 – 35.0 GHz Driver Amplifier

Features

- **Frequency Range: 1.5GHz – 35GHz**
- **Nominal Gain:16.5dB (Typ)**
- **Noise Figure : 3.6dB (Typ)**
- **P1dB: >19dBm**
- **50 Ohm Matched Input / Output**
- **Die Size: 2.8 mm ×2.0 mm × 0.1mm**

Functional Diagram



Typical Applications

- ECCM
- C-to-Ku Band Point-to-Point
- Instrumentation
- Military & Space

Description

The ASL 5004 is an ultra-wide bandwidth Low Noise Amplifier cum Driver Amplifier covering the frequency from 1.5 to 35GHz with Saturated power of 21dBm & P1dB of 19dBm over the band. The device offers a typical small signal gain of 16.5dB over the operating frequency band and has a Noise figure less than 3.8dB(typ) over band. The Input & output are matched to 50Ω with a VSWR better than 1.9:1. The chip is unconditionally stable over the entire operating frequency range.
The ASL 5004 is suitable for a variety of wideband electronic warfare systems such as radar warning receivers, jammers and instrumentation.

Absolute Maximum Ratings[1]

Parameter	Absolute Maximum	Units
Drain supply voltage	+9	V
Gate Voltage	-2.0	V
Drain current	400	mA
RF input power	25	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

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Electrical Specifications @ T_A = 25 °C, Z_o =50Ω[1],

	Typical Values	Units
Frequency range	1.5 – 35.0	GHz
Gain	16.5	dB
Gain Flatness	±1	dB
P1dB	19	dBm
Psat	21	dBm
Input Return Loss	>10	dB
Output Return Loss	>10	dB
Noise Figure	3.6	dB
Voltage -- Vd1 & Vd1	7 & 7	V
Current (Id1+Id2)	100[2] & 150[3]	mA

Note:

1. The above parameters specified are measured in 50-Ohm test fixture.
2. Adjust Vg1 between -1V to -0.6V to achieve Id1 current as 50mA and also adjust Vg2 between -1V to -0.6V to achieve Id2 current as 50mA for total drain current of 100mA operation.
3. Adjust Vg1 between -1V to -0.6V to achieve Id1 current as 50mA and also adjust Vg2 between -0.6V to -0.3V to achieve Id2 current as 100mA for total drain current of 150mA operation

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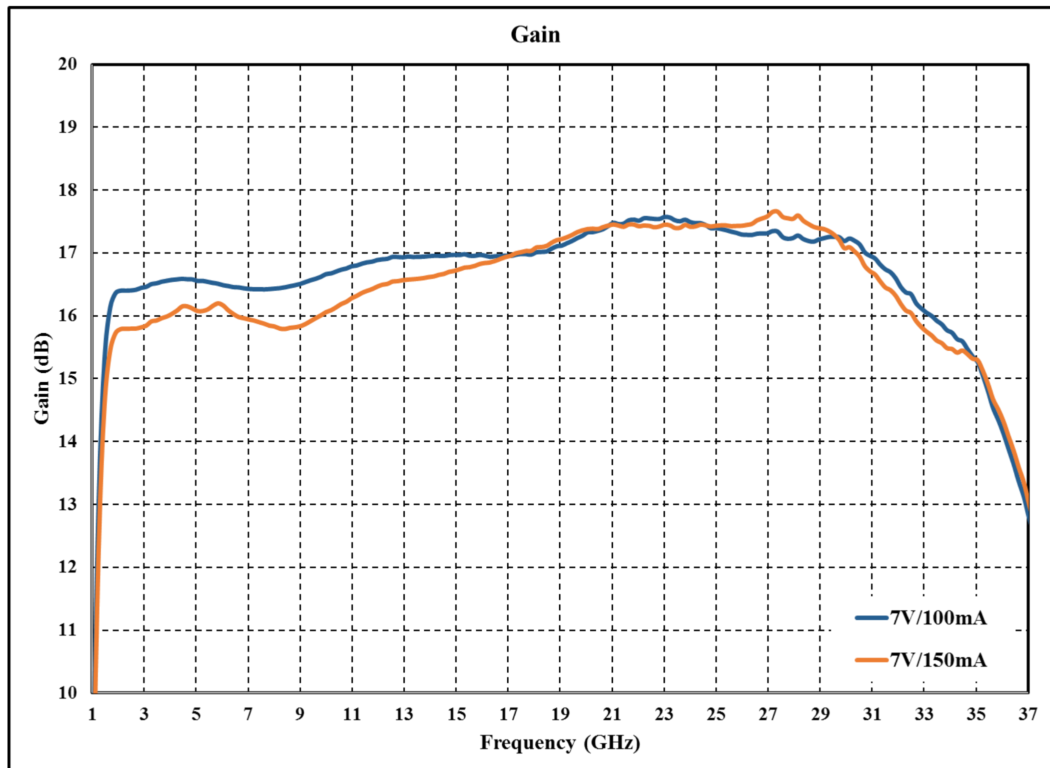
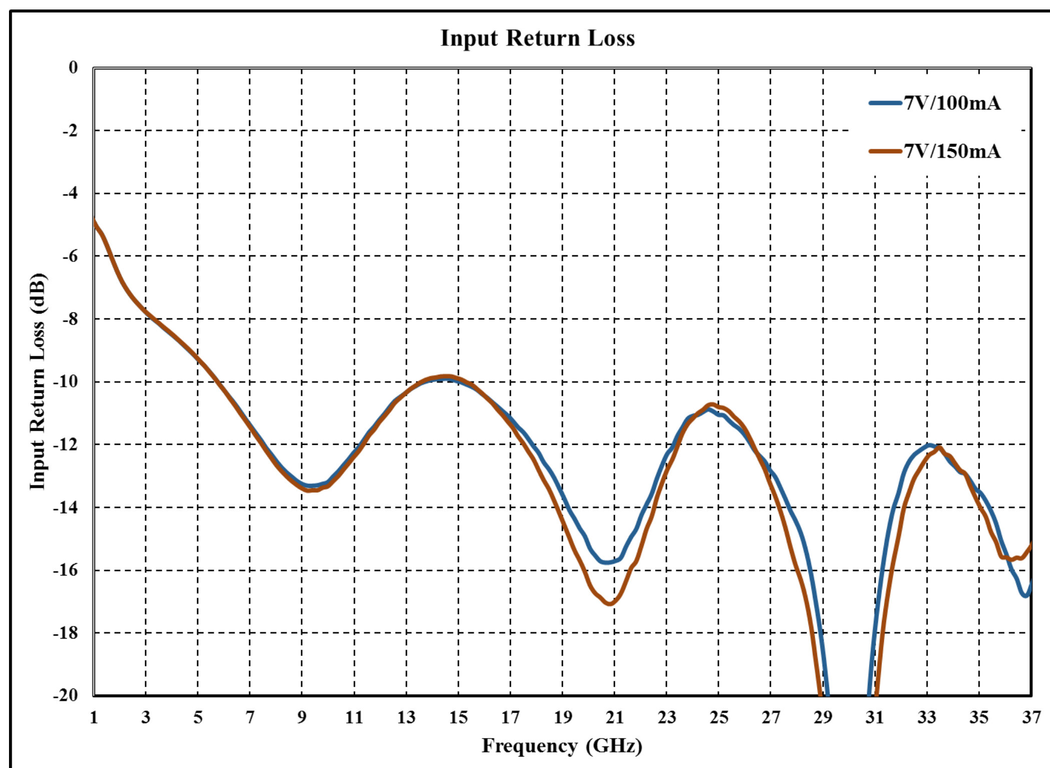
On Wafer Probed Data @ Vd1=Vd2= 7V/100mA, 150mA

T_A = 25 °C, Z_o=50 Ω





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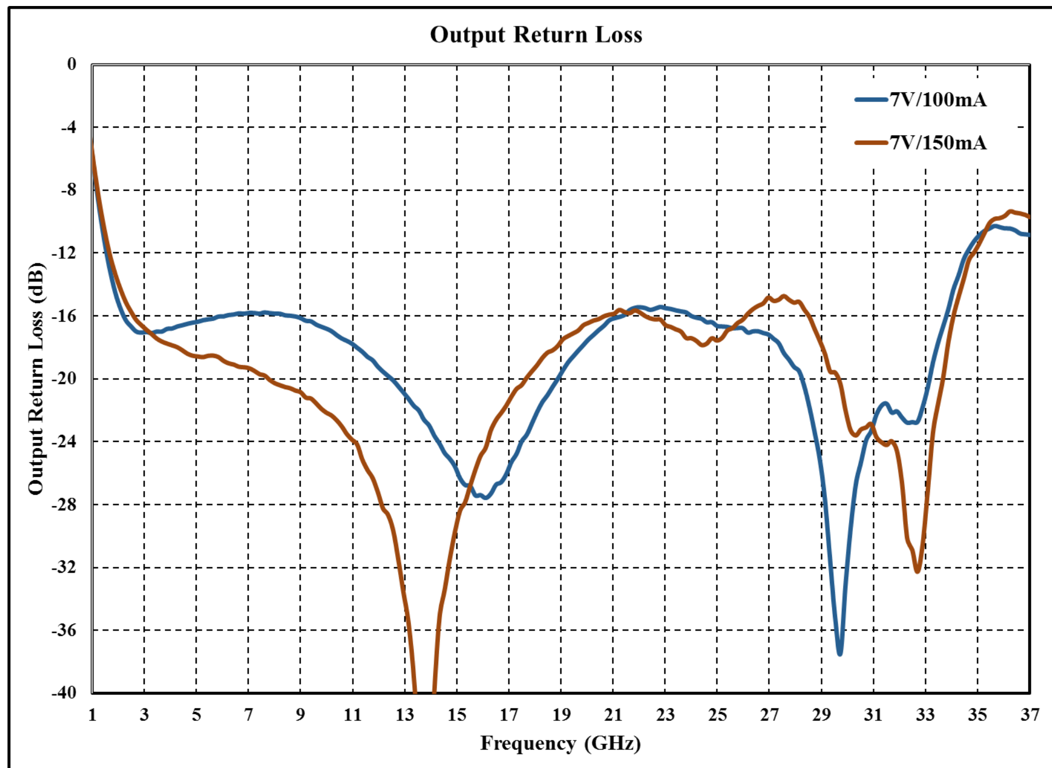

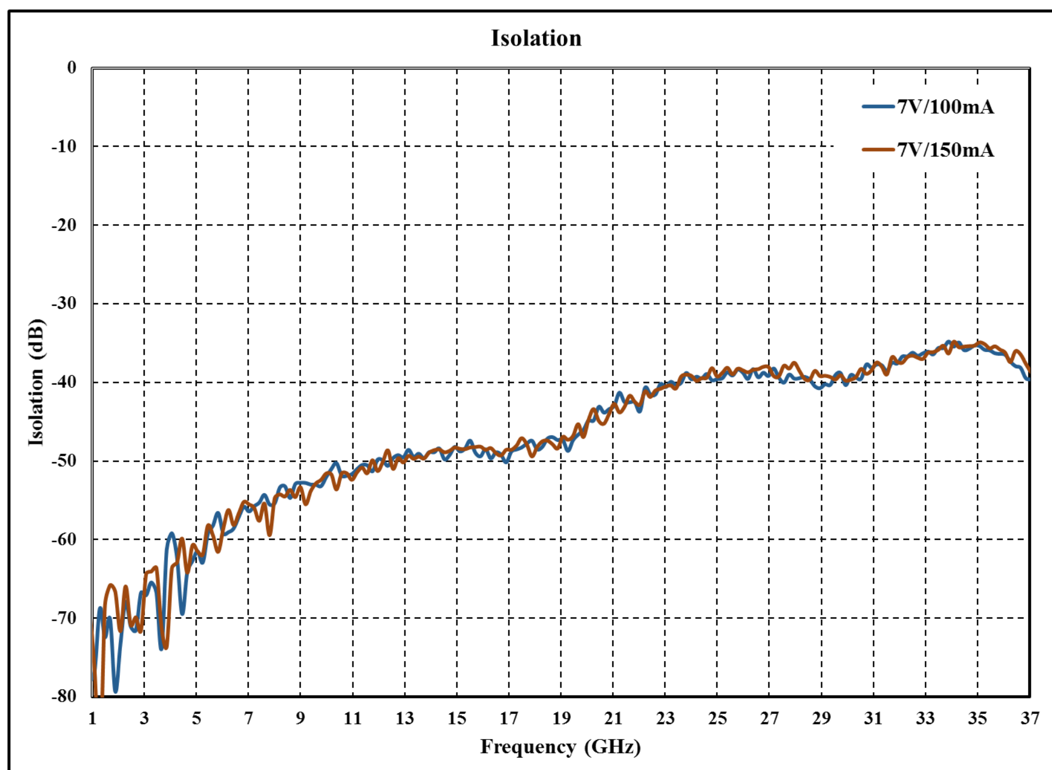

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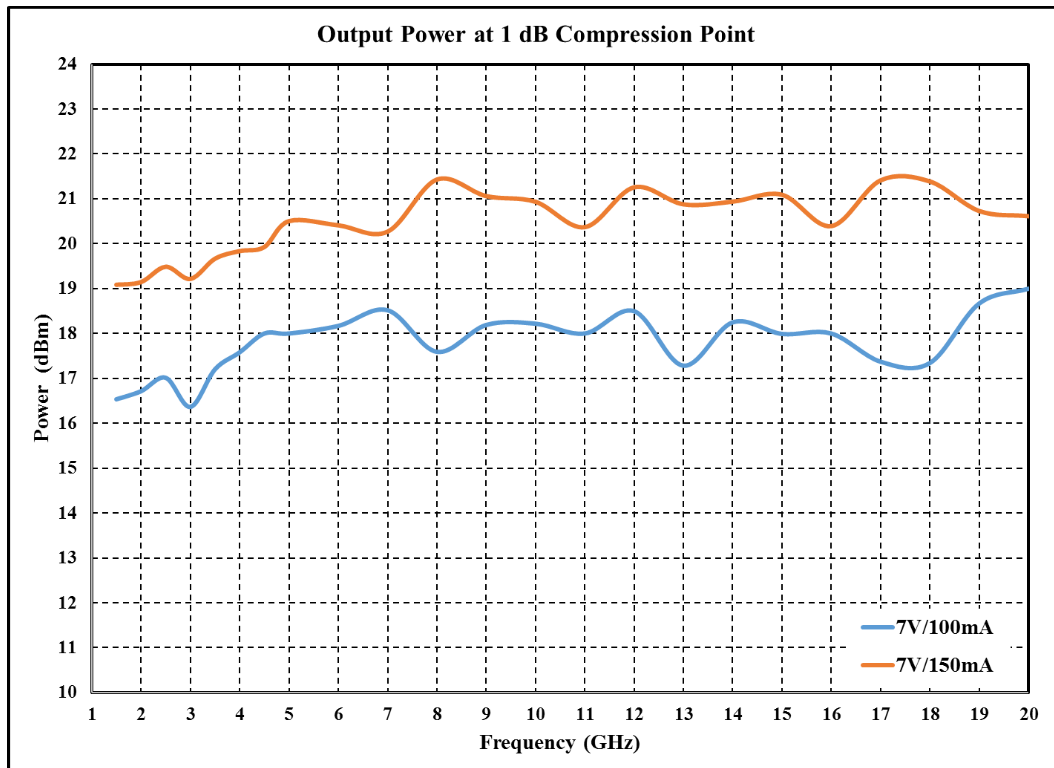
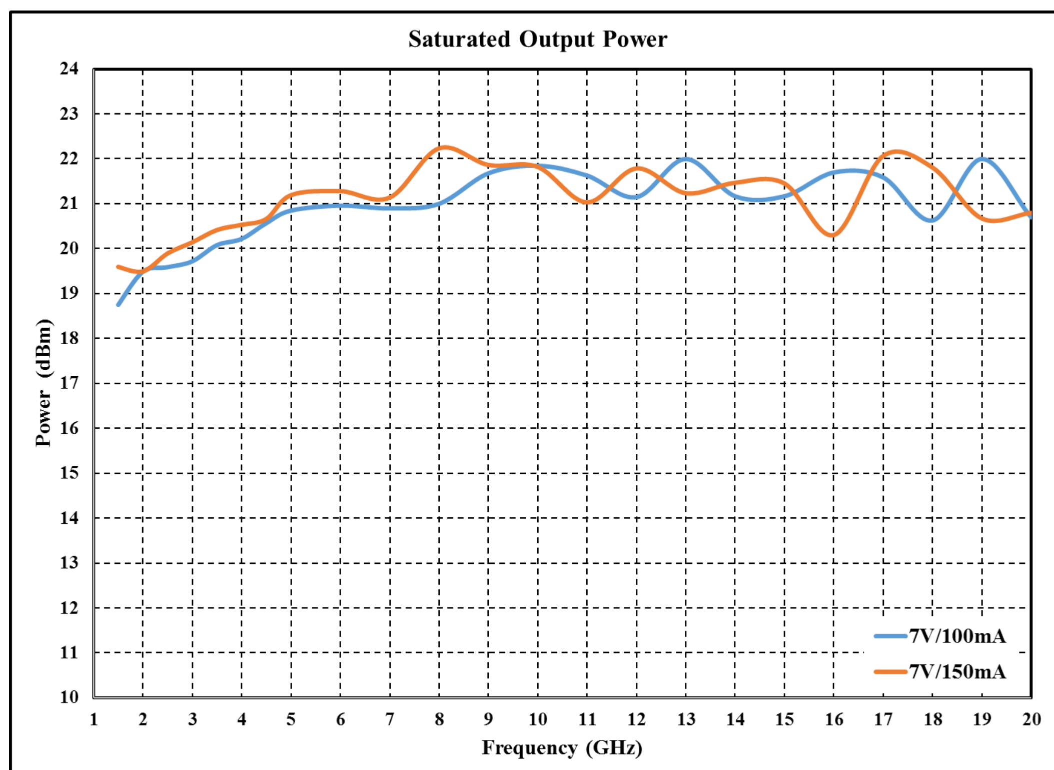
Test Fixture Data @ Vd1=Vd2= 7V/100mA, 150mA

T_A = 25 °C, Z_o=50 Ω





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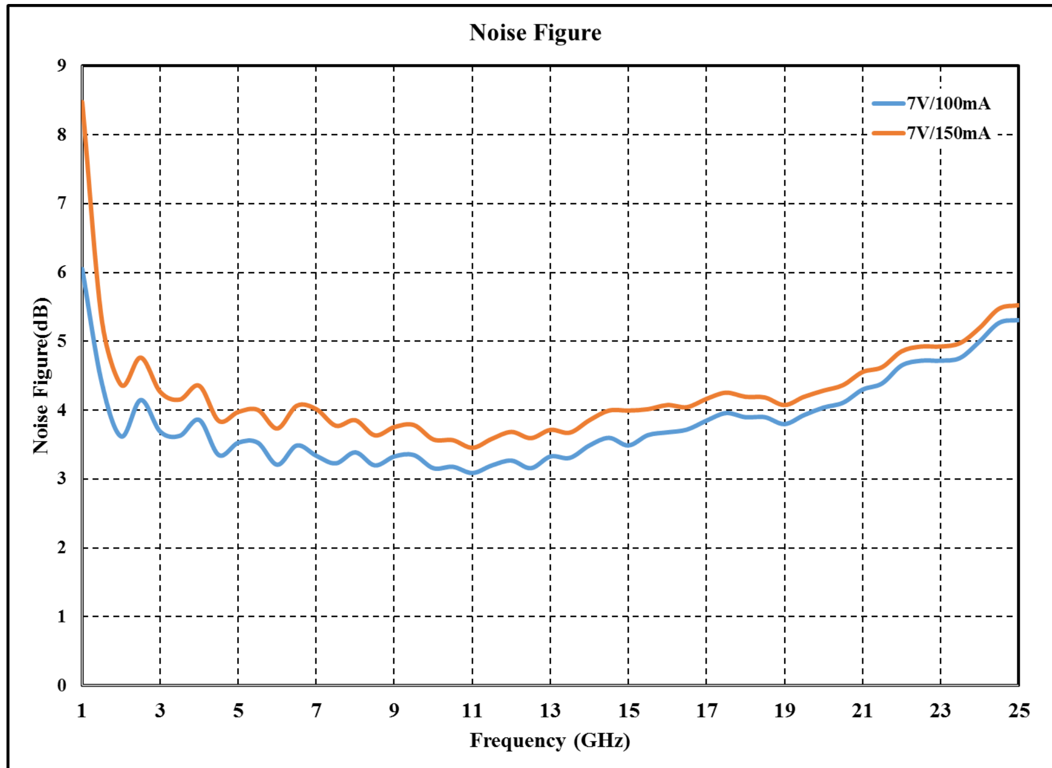

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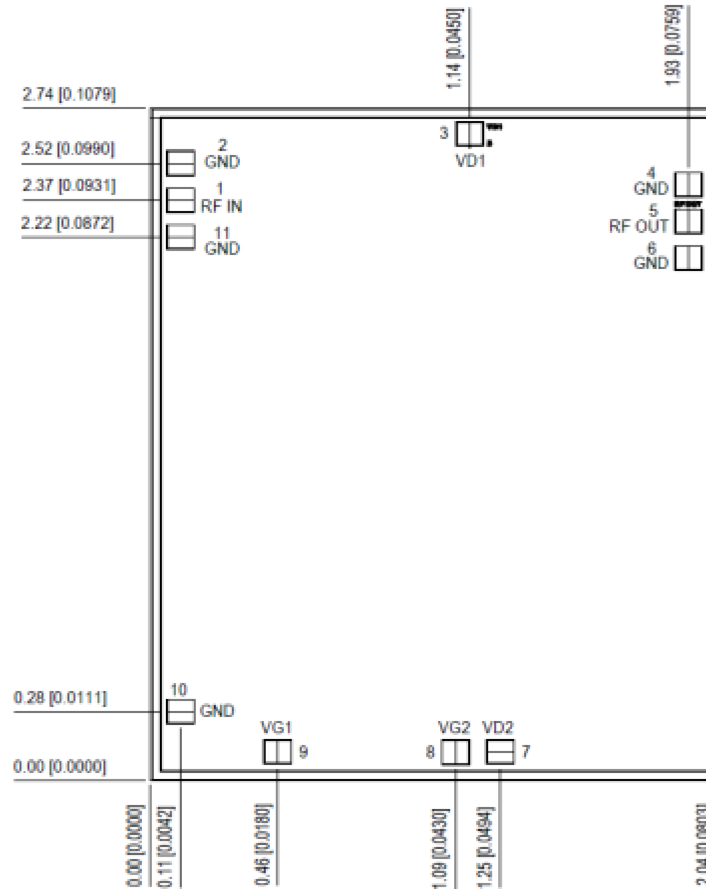
RF and DC Pad Details



Units : millimeters (inches)

1. All RF and DC bond pads are 100µm x 100µm
2. Pad no. 1 : RF IN
3. Pad no. 5 : RF OUT
4. Pad no. 3 : Vd1
5. Pad no. 7 : Vd2
6. Pad no. 8 : Vg2
7. Pad no. 9 : Vg1
8. Pad no. 2,4,6,10 & 11 : GND (Ground)

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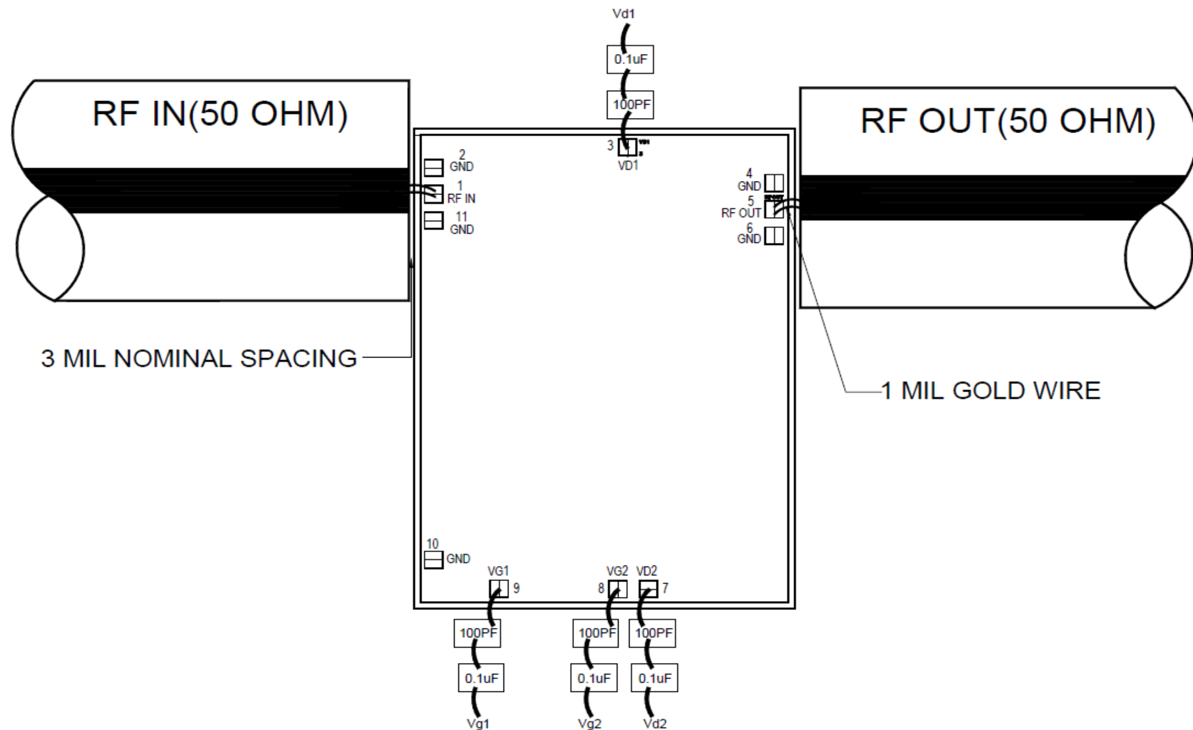
Recommended Assembly Diagram



Note:

1. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input, RF output.
2. Input and output 50-ohm lines are preferably on 5mil or 10mil RT Duroid substrate.

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 flux less 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.

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. Before using the product, please download and refer to latest datasheet from website.

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