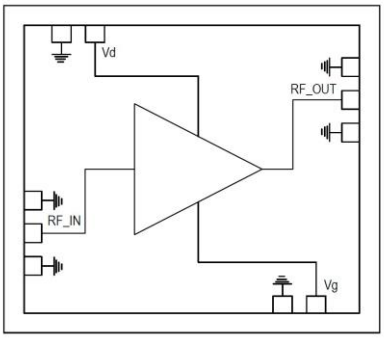
2.0 – 20.0 GHz Driver Amplifier

Features

- **Frequency Range: 2.0GHz – 20GHz**
- **Nominal Gain:13.5dB (Typ)**
- **Noise Figure : 5.0dB (Typ)**
- **P1dB: 17dBm (Typ)**
- **50 Ohm Matched Input / Output**
- **Die Size: 2.8 mm ×1.5 mm × 0.1mm**

Functional Diagram



Typical Applications

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

Description

The ASL5009 is a wide bandwidth medium power driver Amplifier covering the frequency from 2.0 to 20GHz with Saturated power of 20dBm & P1dB of 17dBm typical. The device offers a typical small signal gain of 13.5dB over the operating frequency band and has a Noise figure less than 5.0dB(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 ASL5009 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	Volts
Gate Voltage	-2.0	V
Drain current	400	mA
Pin max	< 10	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

Phone: +65 68092092
Fax: +65 68092001
Email: info@aeliussemi.com
URL: www.aeliussemi.com

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

Parameters	Typical Values	Units
Frequency range	2.0 - 20.0	GHz
Gain	13.5	dB
Gain Flatness	±0.5	dB
P1dB	17	dBm
Psat	21	dBm
Input Return Loss	>10	dB
Output Return Loss	>15	dB
Noise Figure	5.0	dB
Voltage Vd	7	V
Voltage Vg2	5	V
Current (Id1+Id2)	125[2]	mA

Note:

1. The above parameters specified are measured in 50-Ohm test fixture.
2. Vd=7V, Vg2=5V and adjust Vg1 between -1V to -0.8V to achieve total drain current of 100mA/125mA operation.

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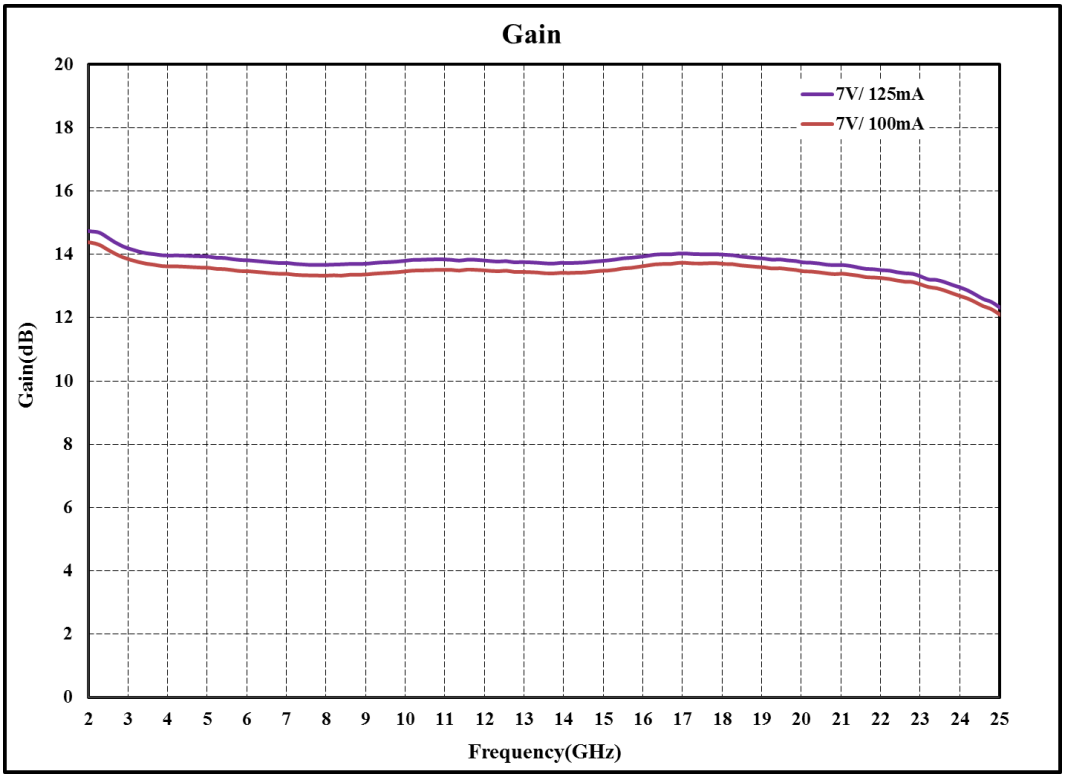
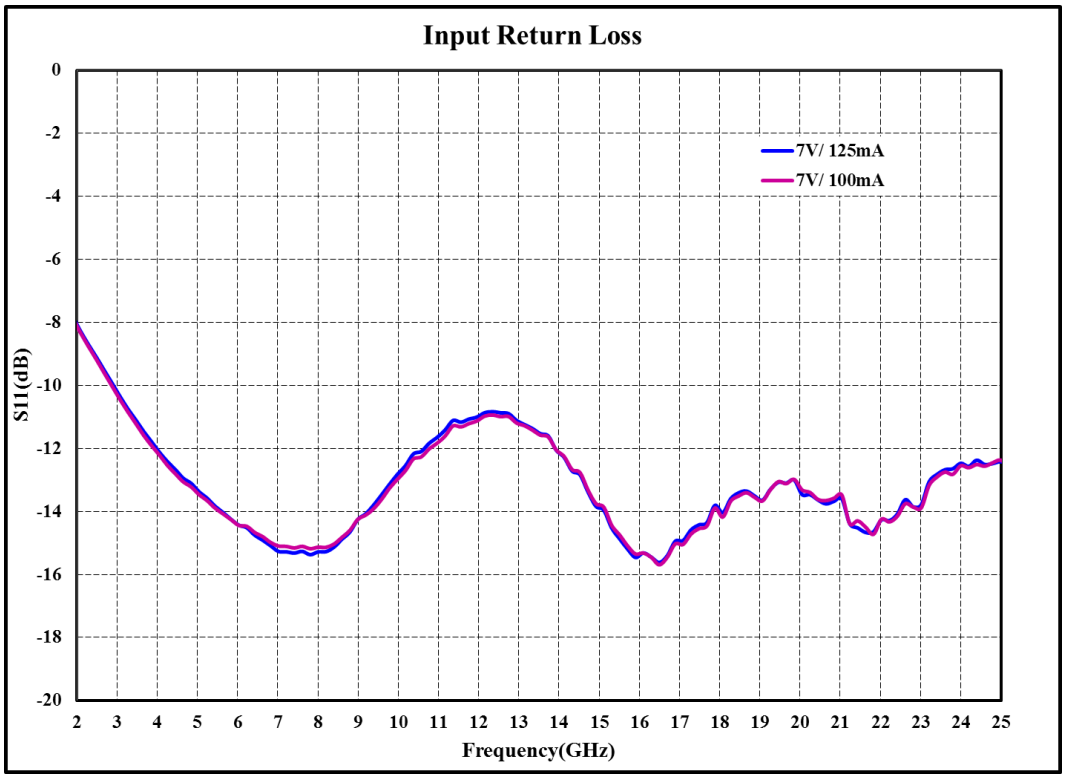
On Wafer Probed Data @ Vd= 7V/100mA, 125mA

T_A = 25 ^oC, Z_o=50 Ω





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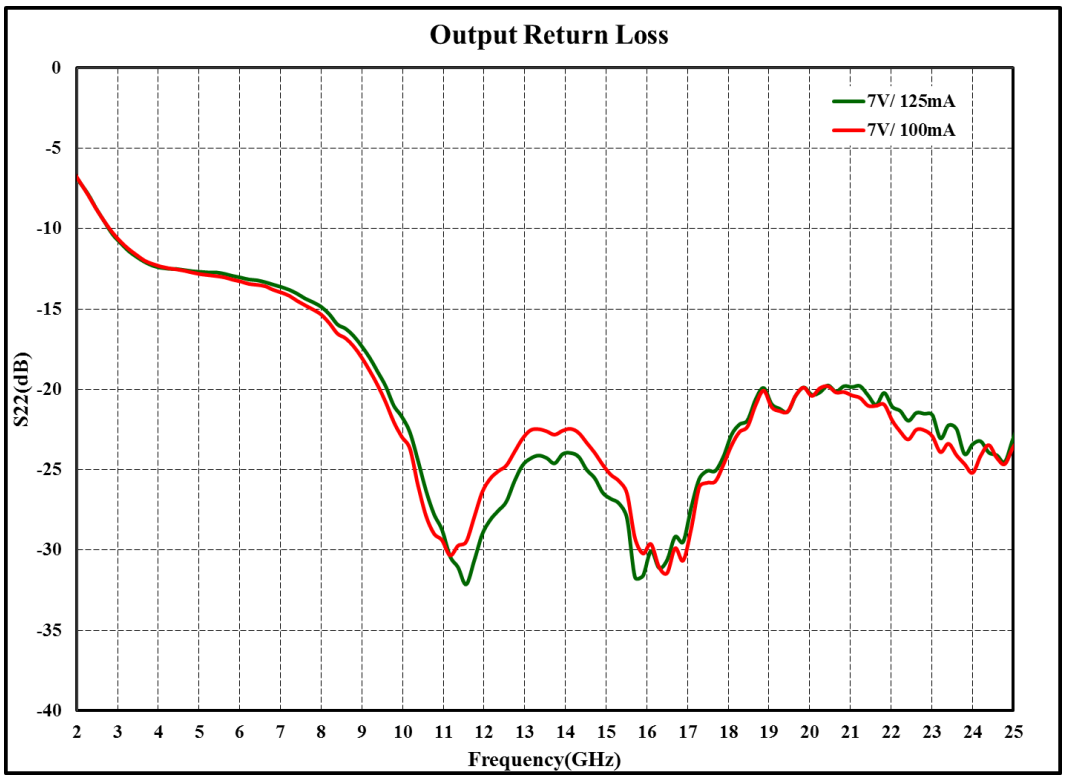

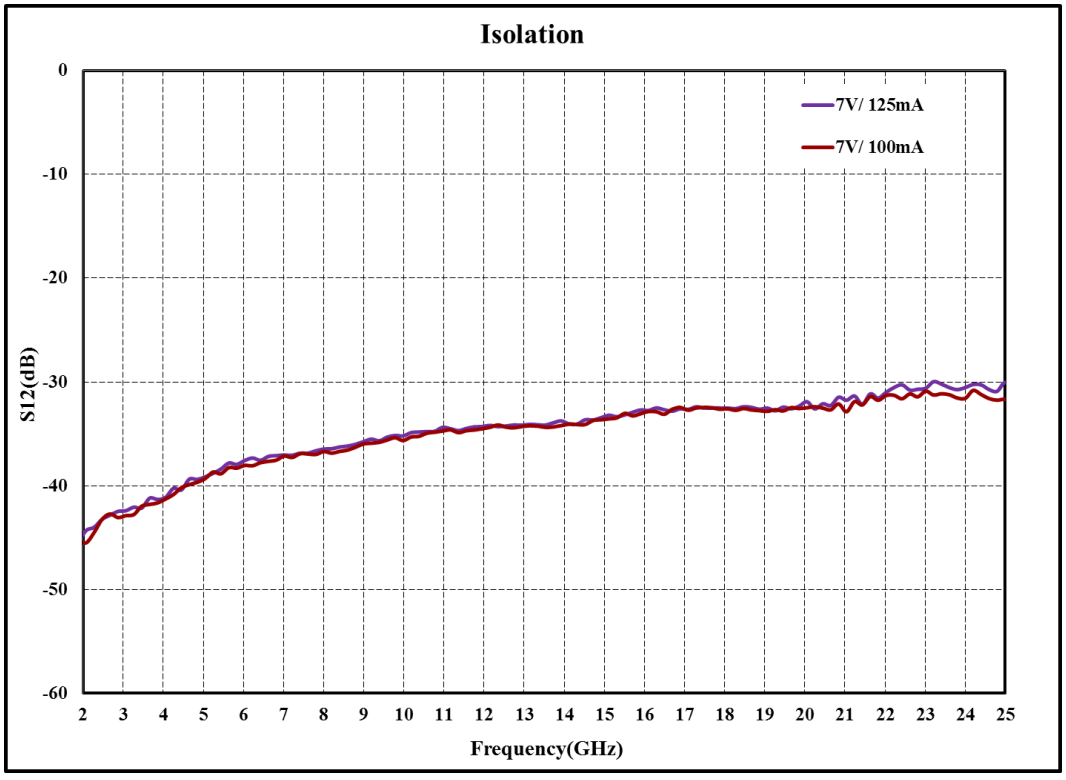

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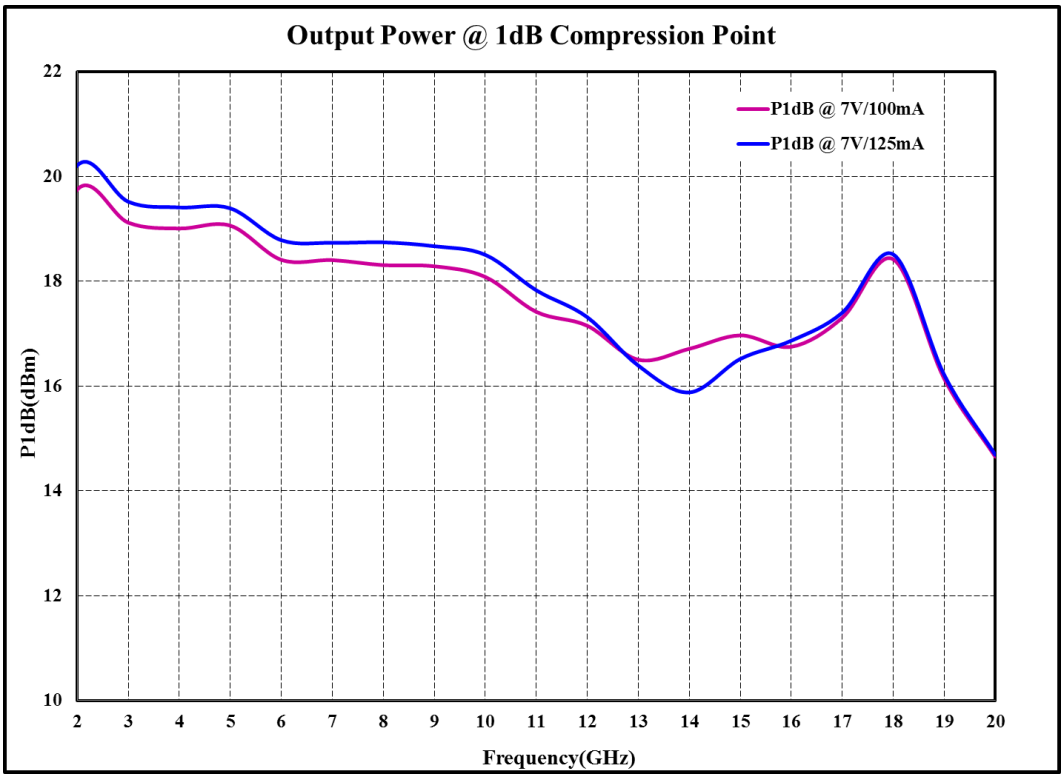
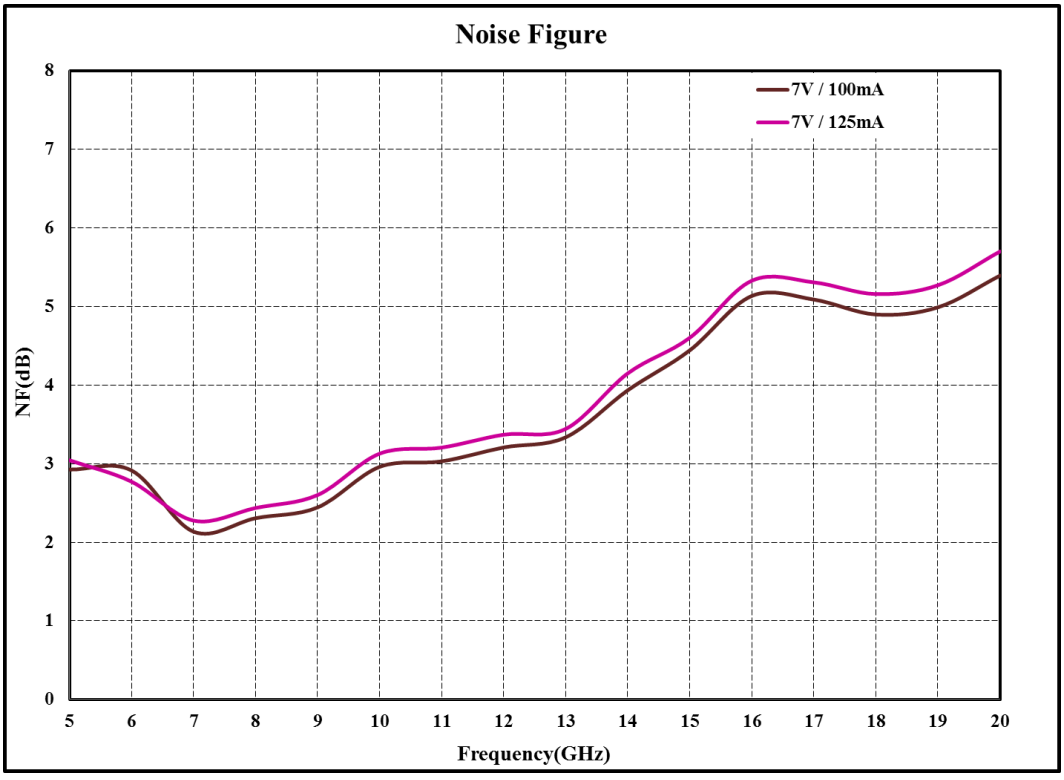
Test Fixture Data @ Vd = 7V/100mA, 125mA

T_A = 25 ^oC, Z_o=50 Ω





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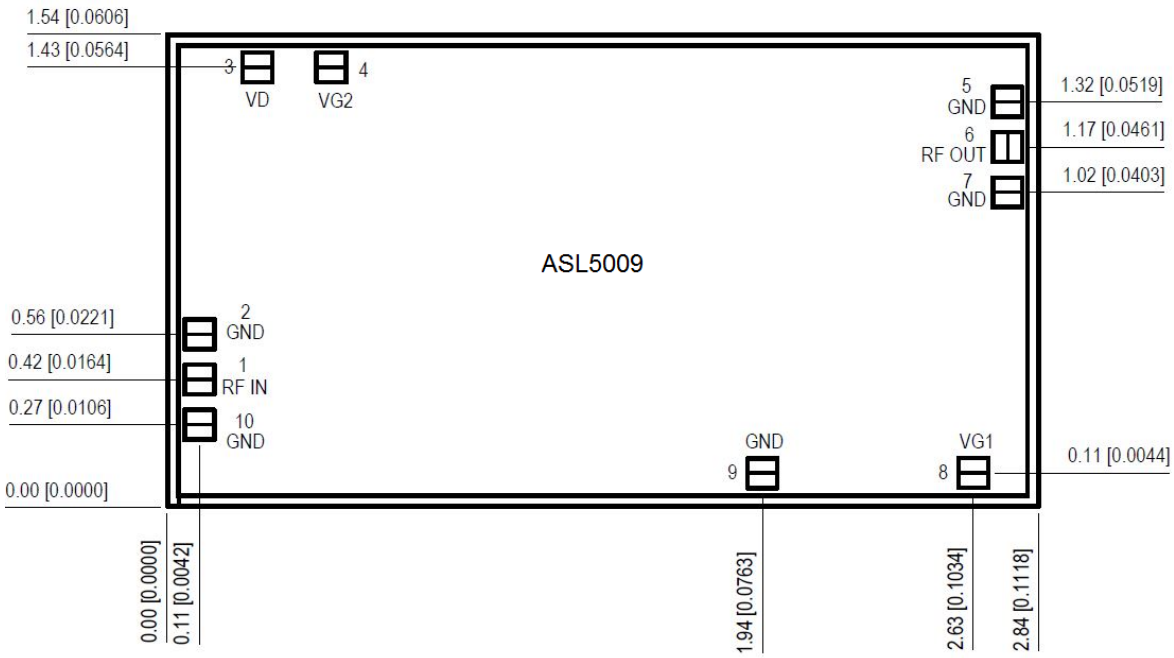
RF and DC Pad Details



Units : millimeters (inches)

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

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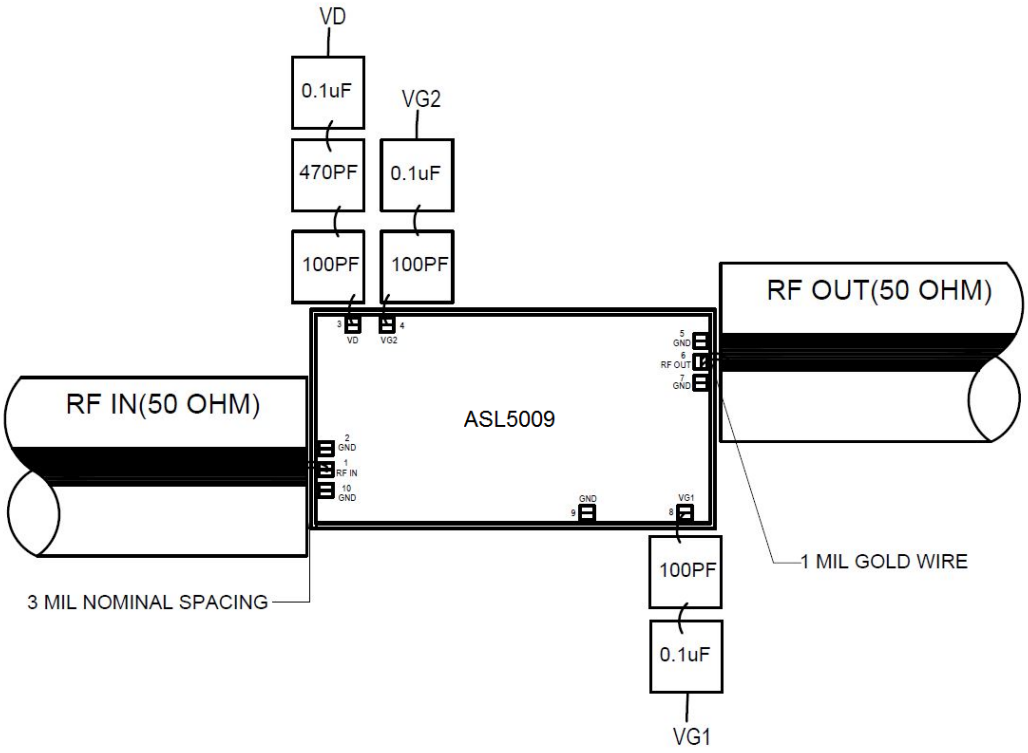
Recommended Assembly Diagram



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.
3. Vd=7V, Vg2=5V and adjust Vg1 between -1V to -0.8V to achieve total drain current of 100mA/125mA operation.

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.

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