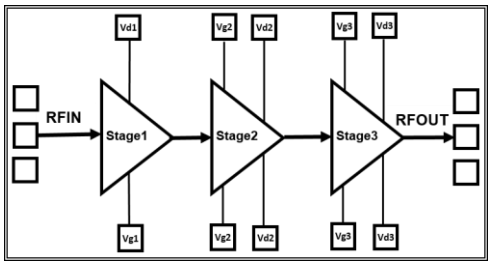
12 – 16 GHz GaN High Power Amplifier

Features

- **Frequency Range : 12 – 16 GHz**
- **Small signal Gain : 24 dB**
- **Power Gain : 18 dB**
- **Psat : 41 dBm (typ)**
- **PAE : 23%**
- **Die Size: 4.9 mm ×2.6 mm**



Typical Applications

- Communications
- Electronic Warfare
- Test Instrumentation
- EMC Amplifier

Description

The ASL 4057 is a three stage High Power Amplifier designed to operate from 12 to 16 GHz frequency band. This Amplifier features 41dBm saturated output power with power gain of 18dB. The power amplifier designed using highly reliable AlGaN/GaN HEMT process.

Absolute Maximum Ratings[1]

Parameter	Absolute Maximum	Units
Drain supply voltage		volts
Drain current (I_{dq})		A
RF input power at Vd=28v		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 @ T_A = 25 ºC, Z_o =50 Ω
Vd=28V, Idq=150mA, *Pulse Duty Cycle=10%*

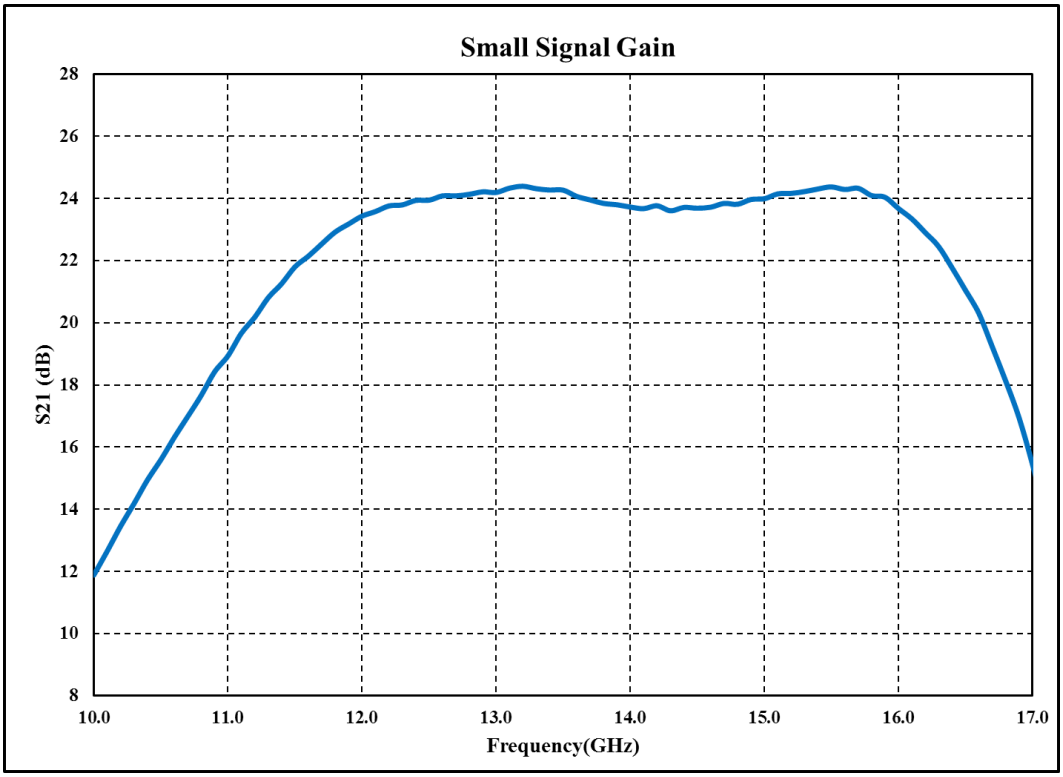
S.No	Parameter	Typical Value	Units
1	Frequency	12 – 16	GHz
2	Small Signal Gain	24	dB
3	Input Return Loss	6	dB
4	Output Return Loss	8	dB
5	Saturated Output Power	41	dBm
6	Power Gain	18	dB
7	PAE	23	%
8	Drain Voltage (Vd)	28	V
9	Quiescent Current (Idq)	150	mA
10	Saturated current	220	mA
11	Die Size	4.9 x 2.6 x 0.1	mm

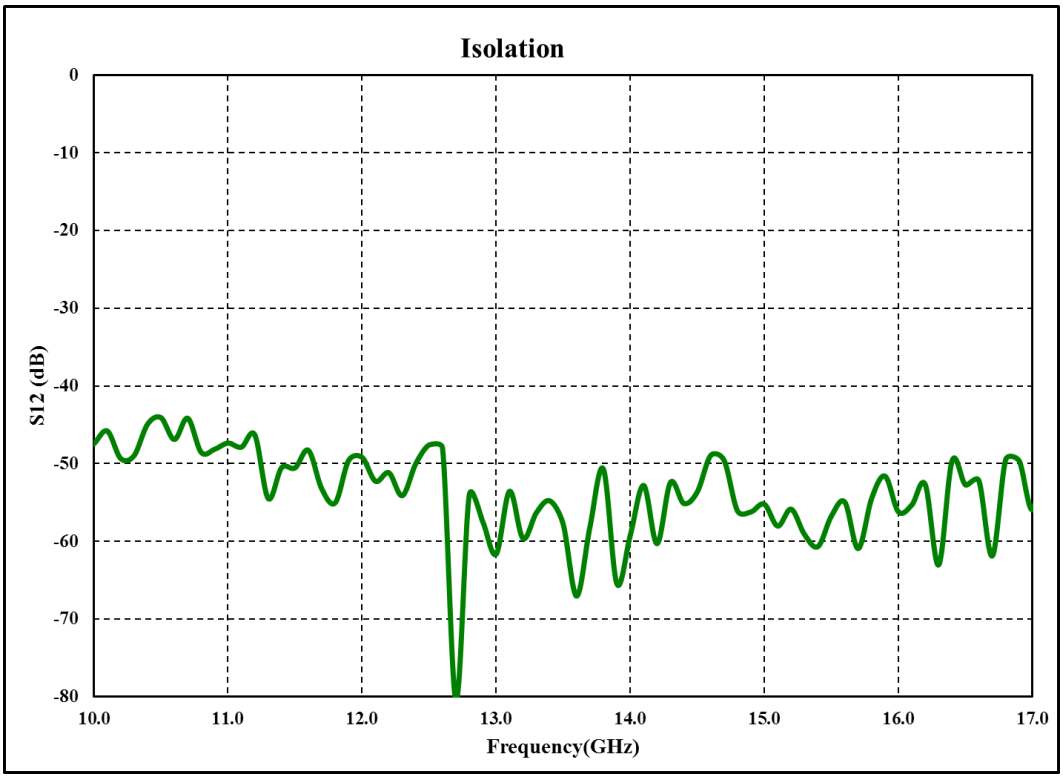
Note:

1. The above parameters specified are measured in 50-Ohm test fixture.
2. Adjust Vg between -4.5V to -2.5V to achieve required Idq.

Test Fixture Data for Vd=28V, Idq=150mA,

TA = 25 °C, Zo=50 Ω, Pulse Duty Cycle=10%





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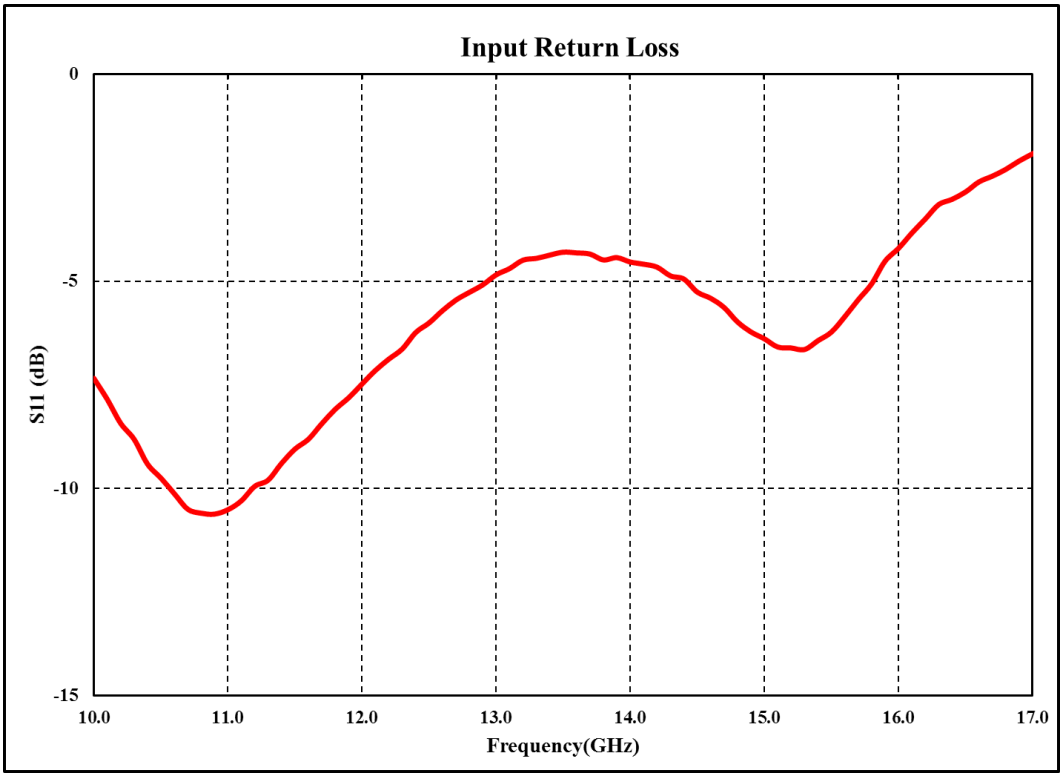

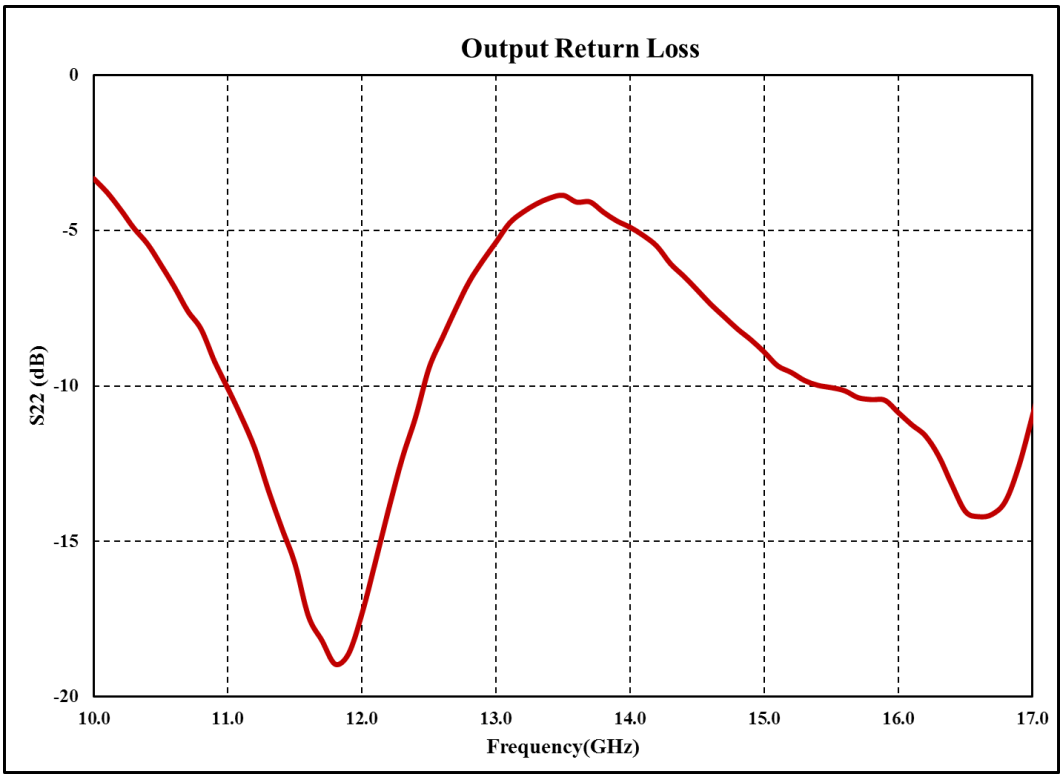

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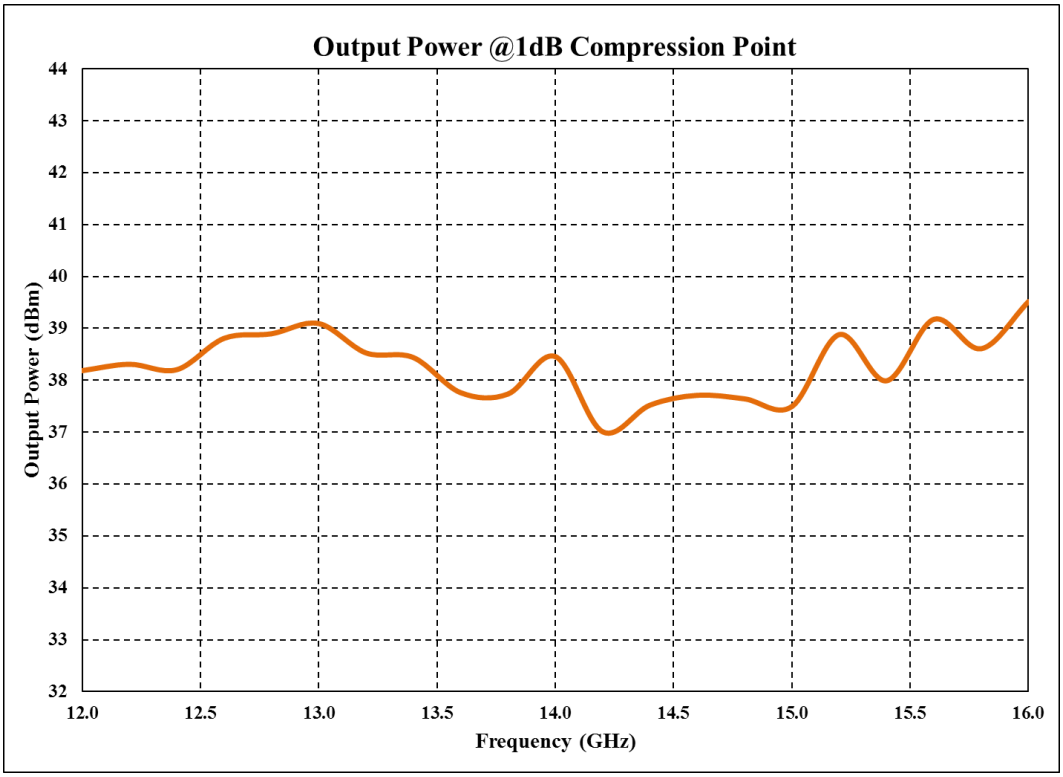

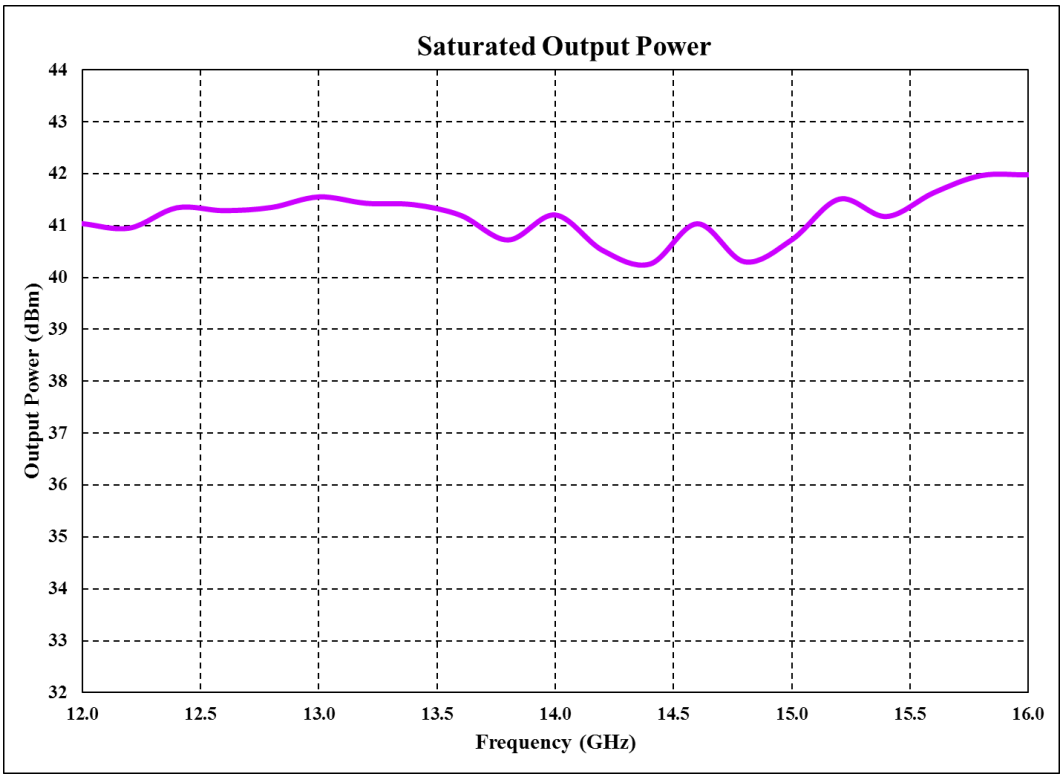

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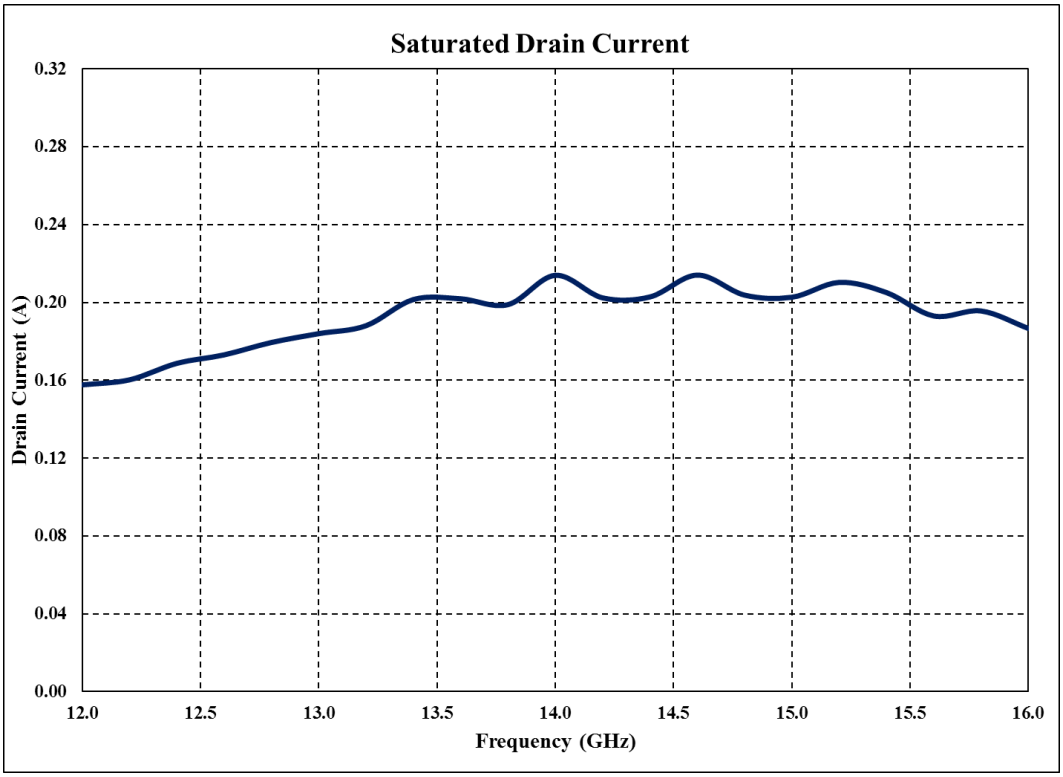
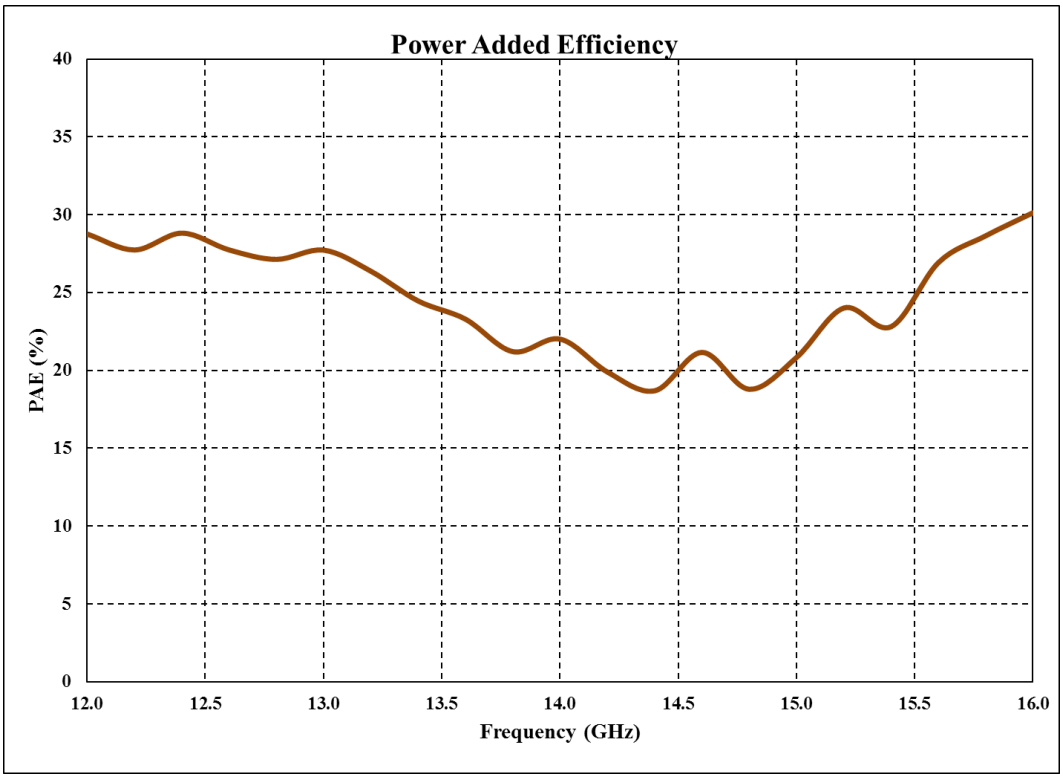
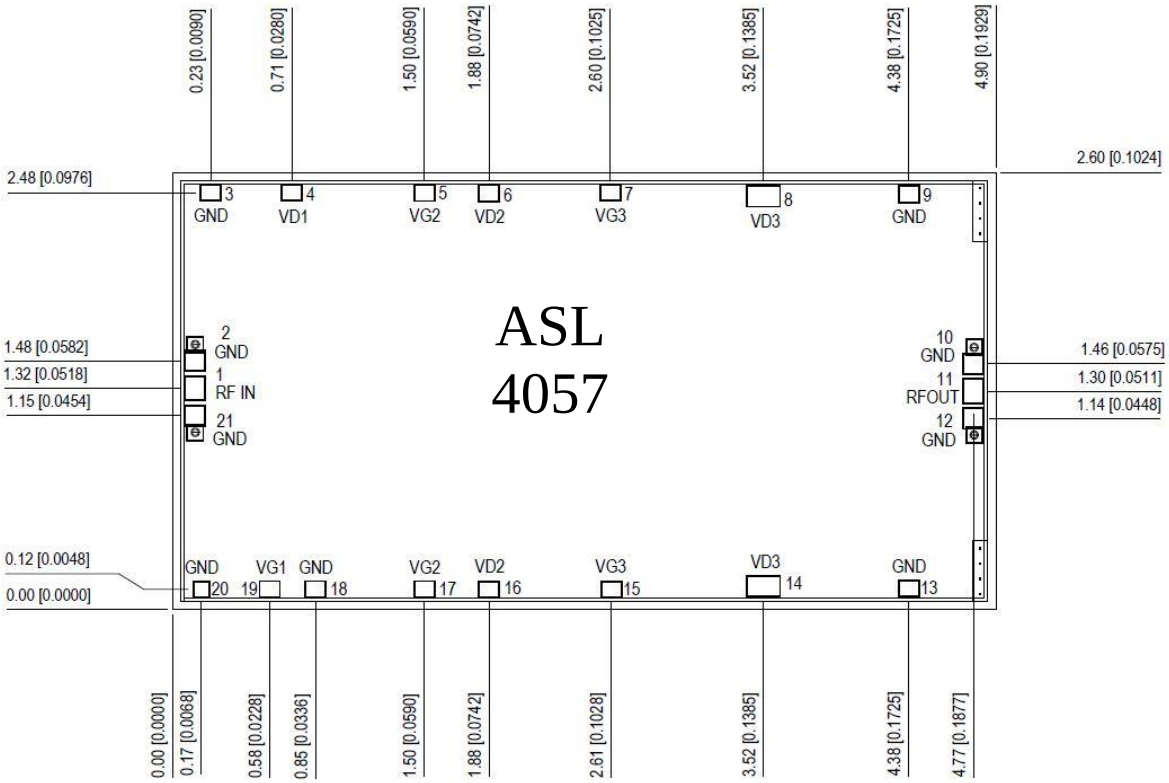




Bond Pad Location

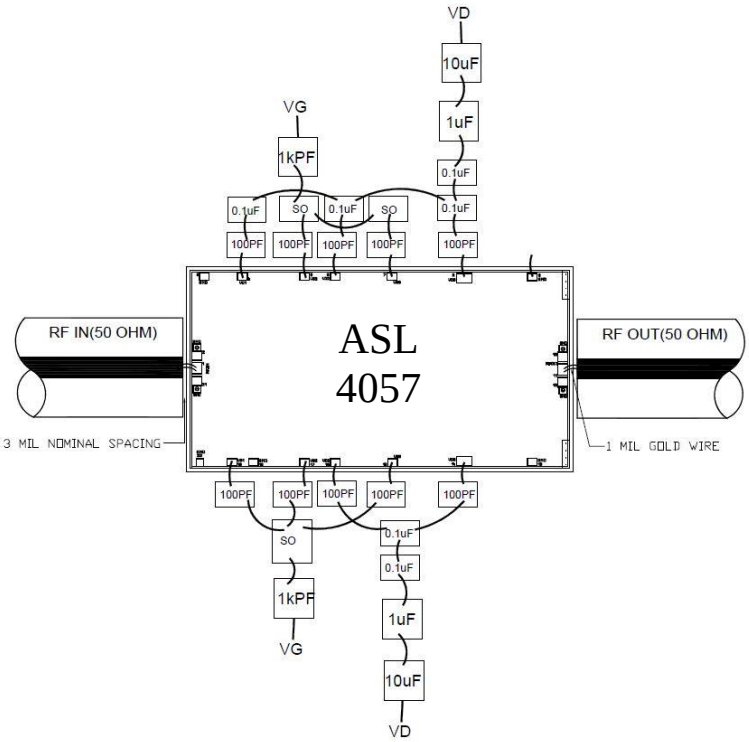


Units: millimeters (inches)

Note:

1. Pad no. 1 : RF IN
2. Pad no. 11 : RF Out
3. Pad no. 19 : Vg1
4. Pad no. 4 : Vd1
5. Pad no. 5,17 : Vg2
6. Pad no. 6,16 : Vd2
7. Pad no. 7,15 : Vg3
8. Pad no. 8,14 : Vd3
9. Pad no. 2,3,9,10,12,13,18,20,21 : GND

Recommended Assembly Diagram



S.No	Component Value	Description
1	100 pF (Gate Bypass)	Cap, D10/D12, 16V
2	100 pF (Drain Bypass)	Cap, D10/D12, 50V
3	1 KpF	Cap, 0402 X7R, 16V
4	0.1 uF	Cap, 0402 X7R, 50V
5	1 uF	Cap, 0402 or 0603 X7R, 50V
6	10 uF	TANT Cap, D case, 35V or 50V

Note:

1. Input and output 50 ohm lines are preferably on 5mil or 10mil RT Duroid substrate.
2. Use high thermal conductive material for die mounting/die attachment for long-term reliability.

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