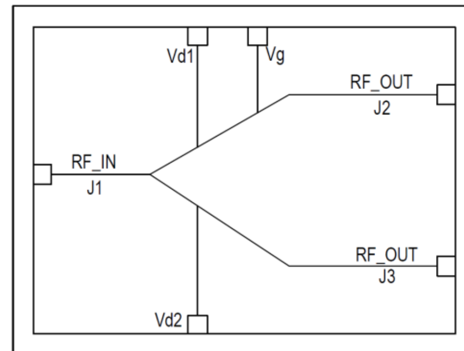
2 - 18 GHz GaN Active Power Divider

Features

- Frequency Range: 2 GHz – 18 GHz
- 5 dB (Typ.) small signal gain
- 31 dBm Output P_{sat}
- Input Return Loss: > 5 dB
- Output Return Loss: > 10 dB
- GaN HEMT Technology
- Die size: 3.5mm x 2.1mm x 0.1mm



Functional Diagram

Typical Applications

- DLVA system
- Wideband Receiver
- Wideband CATV application

Description

The ASL11003 is GaN HEMT based active power divider, designed for frequency band of 2 to 18 GHz. The active power divider has common input with dual outputs which are matched to 50 ohms, the dual outputs delivers 31dBm (Typ) output power with small signal Gain of 5dB in each arm. The input return loss is greater than 5dB and output return loss greater than 10dB over the entire operating band. On-chip circuit grounds are provided through vias to the backside metallization

Absolute Maximum Ratings (1)

Parameter	Absolute Maximum	Units
Drain supply voltage	+35	volts
Drain current (I_{dq})	5	A
RF input power at V_d=25 V	30	dBm
Operating temperature	-50 to +85	^oC
Storage Temperature	-65 to +150	^oC

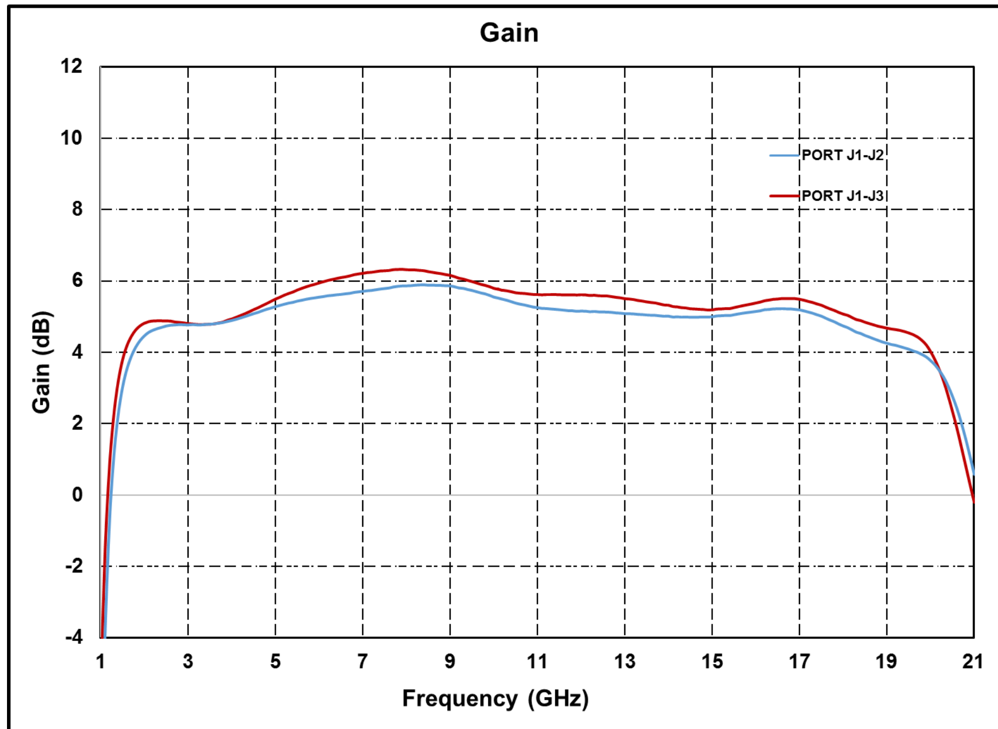
1. Operation beyond these limits may cause permanent damage to the component

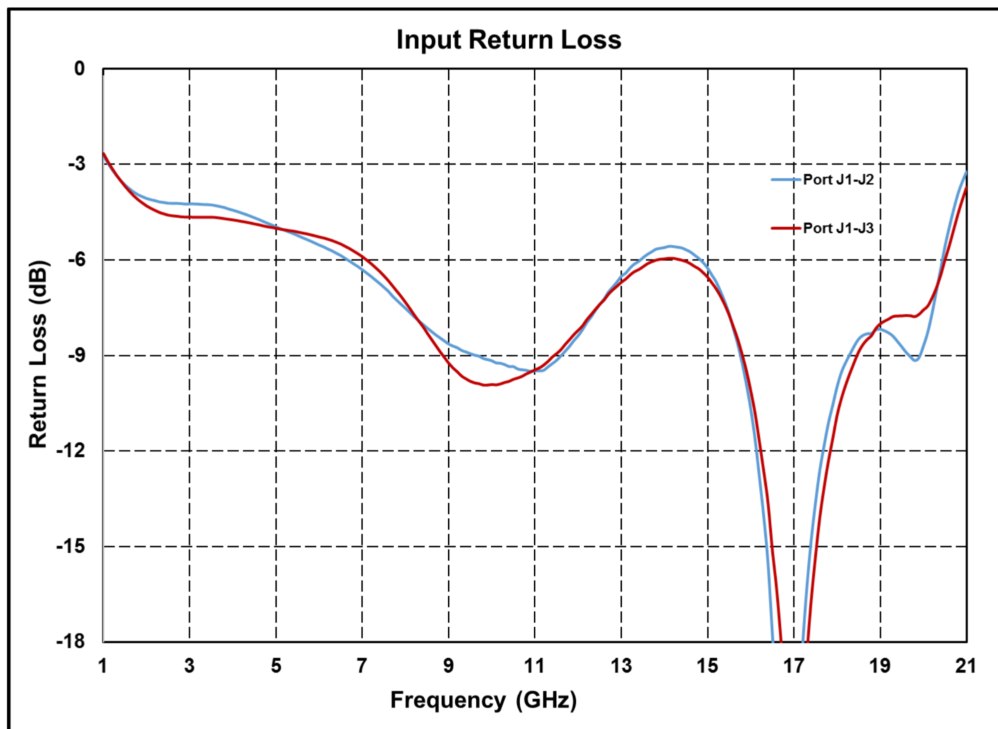
Electrical Specifications [1] @ T_A = 25 °C, Vd = 25 V, V_g = -3V, Z_o = 50 Ω

Parameter	Min	Typ.	Max	Units
Frequency Range	2	-	18	GHz
Gain	4	5	-	dB
Gain Flatness	-	±1	-	dB
Input Return Loss	-	> 5	-	dB
Output Return Loss	-	> 10	-	dB
Psat	-	31	-	dBm
Drain Bias Voltage (V_{d1}, V_{d2})	-	25	28	V
Gate Bias Voltage (V_g)	-	3	-	V
Current	-	275	-	mA

Test Fixture Data:

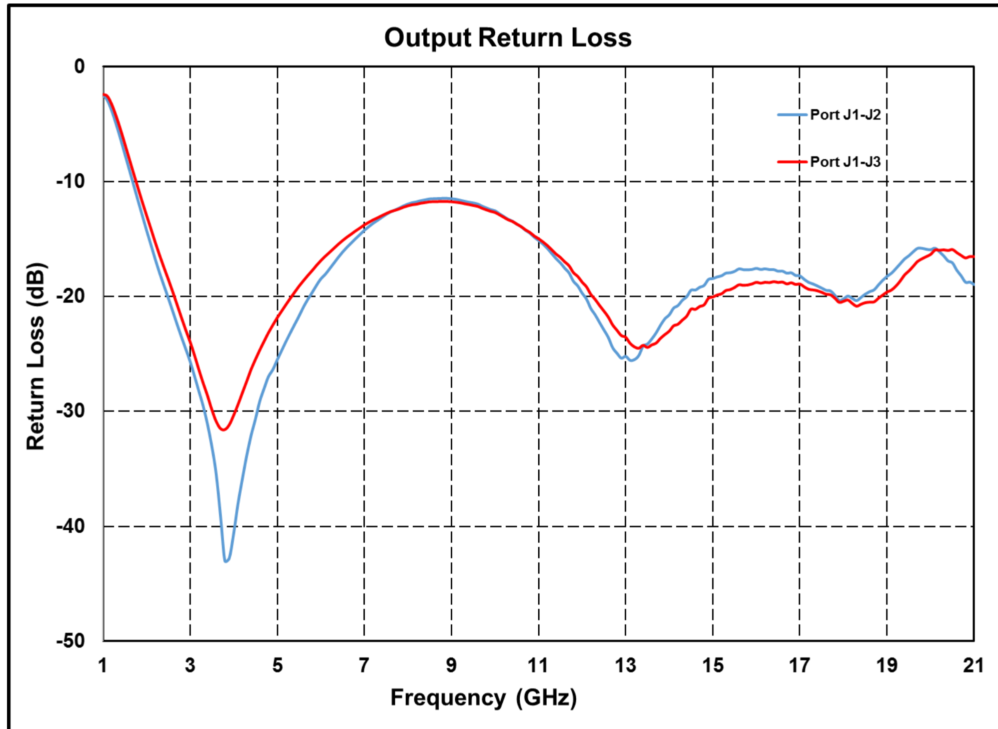
$V_{d1} = V_{d2} = 25\ V,\ V_g = -3V,\ I_{dq} = 275\ mA,\ T_A = 25\ ^0C$

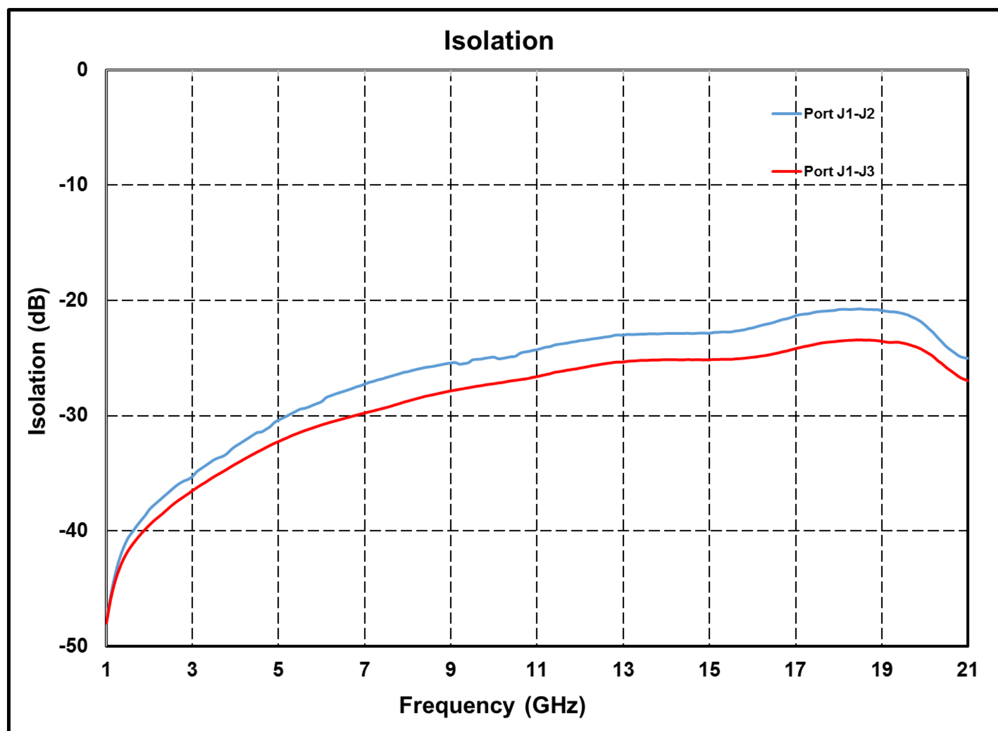




Test Fixture Data:

$V_{d1} = V_{d2} = 25$ V, $V_g = -3$V, $I_{dq} = 275$ mA, $T_A = 25\ ^0C$





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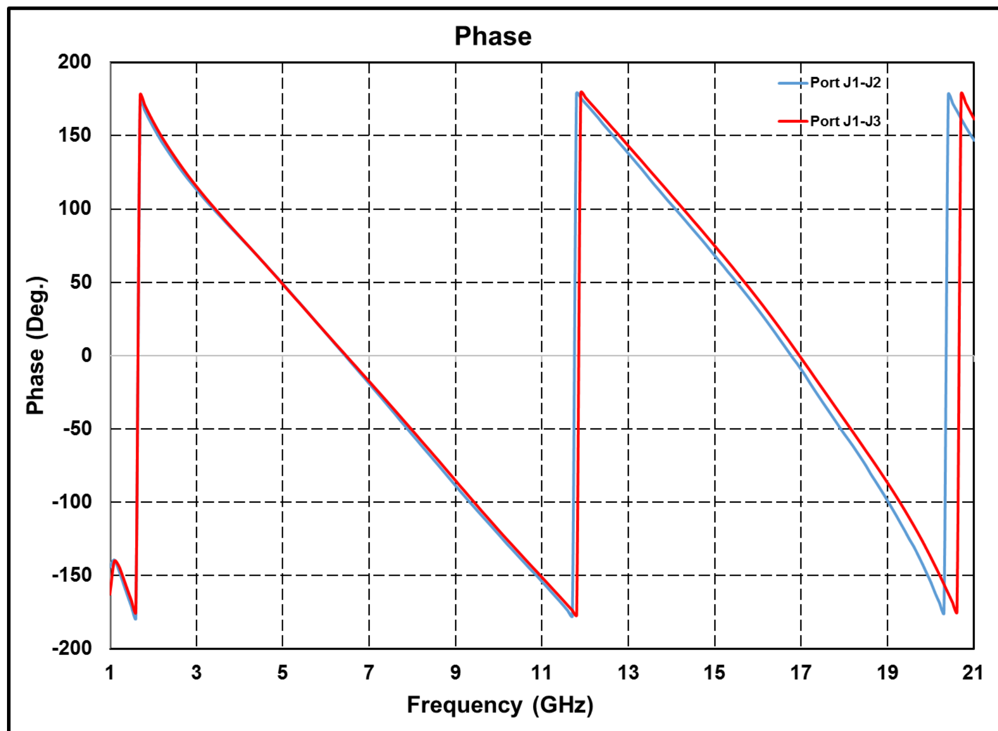
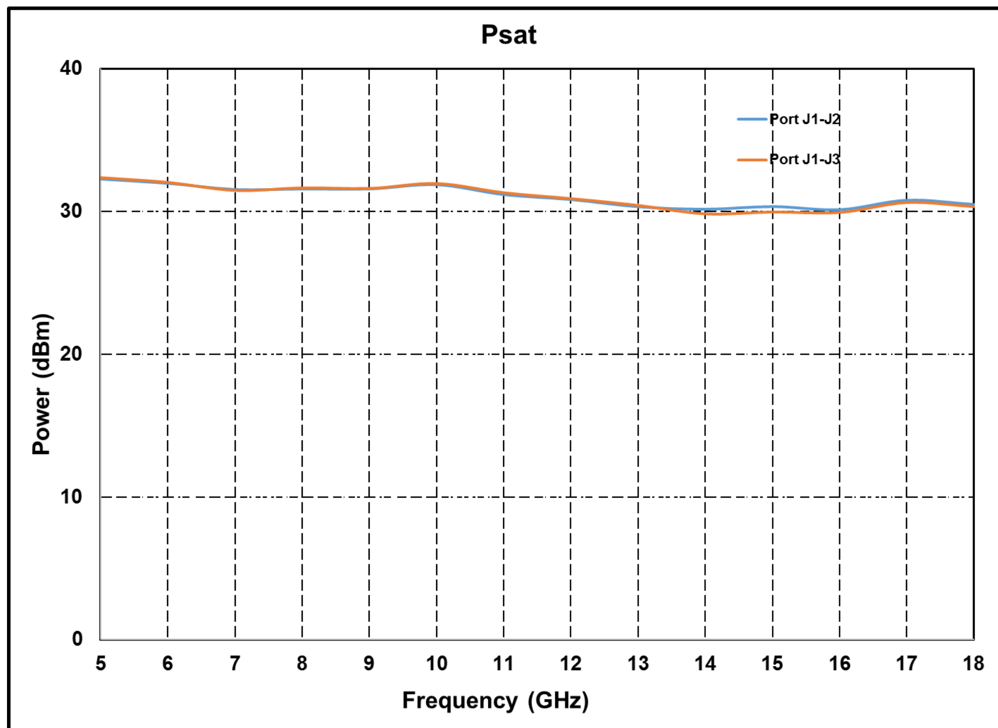
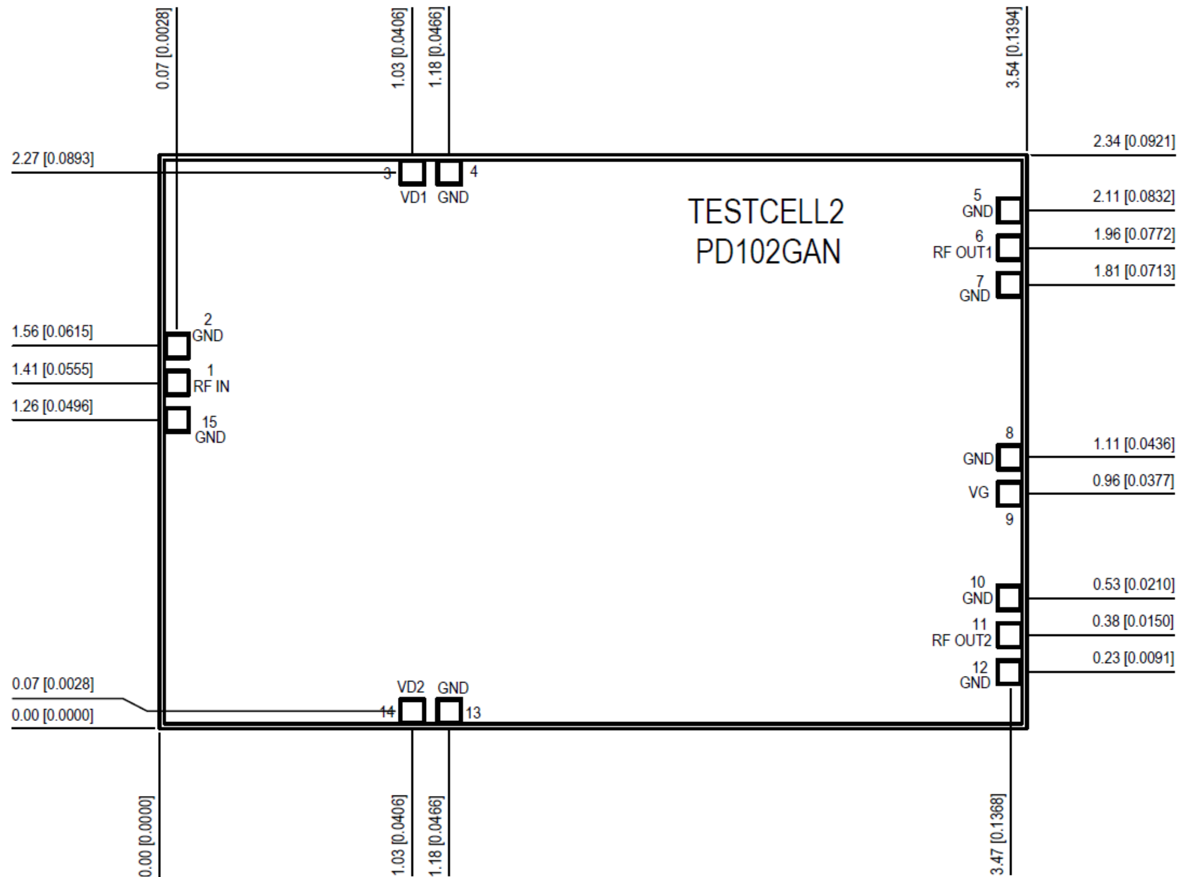




Mechanical Characteristic

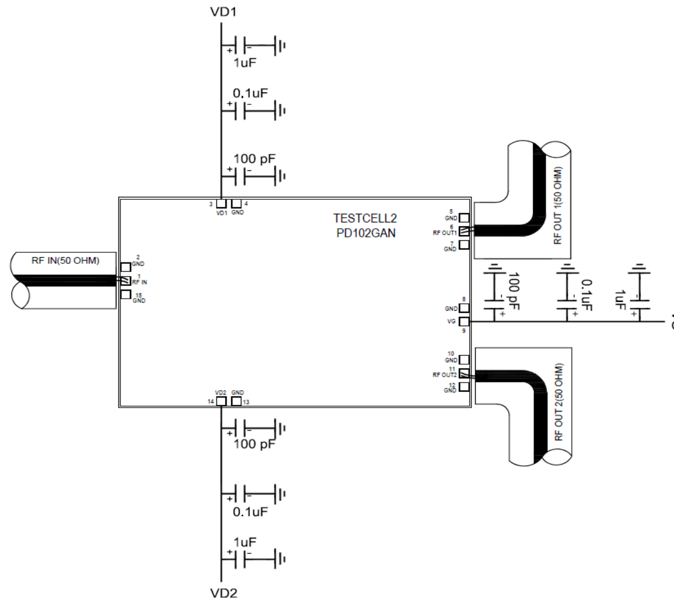


Units: millimeters (inches)

Note:

1. All RF and DC bond pads are 100μm x 100μm
2. Pad no.1 : RF IN
3. Pad no. 6, 11 : RF OUT1 and RFOUT2
4. Pad no. 3, 14 : VD1, VD2
5. Pad no. 9 : VG
6. Pad no. 2, 4, 5, 7, 8, 10, 12, 13, 15: Ground

Recommended Assembly Diagram



Note:

1. Two 1-mil (0.0254mm) bond wires of minimum length should be used for RF input, RF outputs and from chip bond pad to 100pF single layer capacitor.
2. Input and output 50-ohm lines are preferably on 5mil or 10mil RT Duroid substrate.
3. The RF input & output ports are DC decoupled on-chip.
4. Coefficient of thermal expansion matching is recommended for reliability purpose.
5. Use high thermal conductive material for die mounting for long-term reliability.

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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