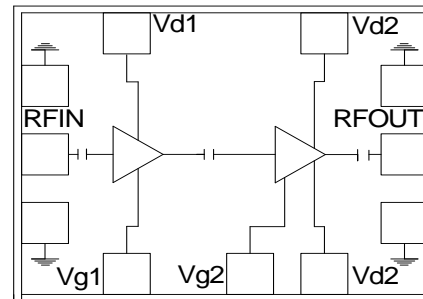


29 - 31 GHz Power Amplifier

Features

- ◆ Frequency Range : 29 - 31GHz
- ◆ 27 dBm output P1dB
- ◆ 11 dB Power gain
- ◆ 30% PAE
- ◆ High IP3
- ◆ Input Return Loss > 7 dB
- ◆ Output Return Loss > 10 dB
- ◆ Dual bias operation
- ◆ No external matching required
- ◆ DC decoupled input and output
- ◆ 0.15 μm InGaAs pHEMT Technology
- ◆ Chip dimension: 2.6 x 1.5 x 0.1 mm

Functional Diagram



Typical Applications

- ◆ RADAR
- ◆ Military & space
- ◆ LMDS, VSAT

Description

The ASL4030 is a Ka-band Power amplifier with 27dBm power output. The PA uses 2 stages of amplification and operates in 29 - 31 GHz frequency range. The PA features 11 dB of gain with input and output return losses of 7 dB and 10 dB respectively. The PA has a high IP3 of 37dBm and greater than 30% PAE. This feature enables it to be used in the applications requiring efficiency along with linearity. The chip operates with dual bias supply voltage. The die is fabricated using a reliable 0.15 μm InGaAs pHEMT technology. The Circuit grounds are provided through vias to the backside metallization.

Absolute Maximum Ratings ⁽¹⁾

Parameter	Absolute Maximum	Units
Drain bias voltage (Vd)	+7	volts
Drain current (Id)	420	mA
RF input power (RFin at Vd=5V)	25	dBm
Operating temperature	-50 to +85	$^{\circ}\text{C}$
Storage Temperature	-65 to +150	$^{\circ}\text{C}$

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

**Electrical Specifications ⁽¹⁾ @ T_A = 25 °C, V_{d1} = V_{d2} = 5V, V_{g1} = V_{g2} = -0.75V
Z_o = 50 Ω**

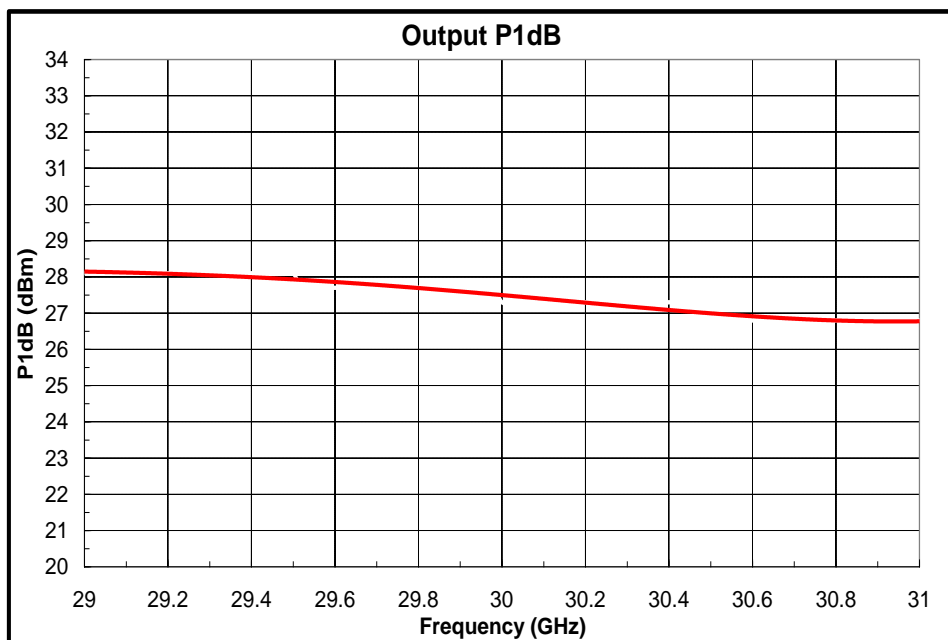
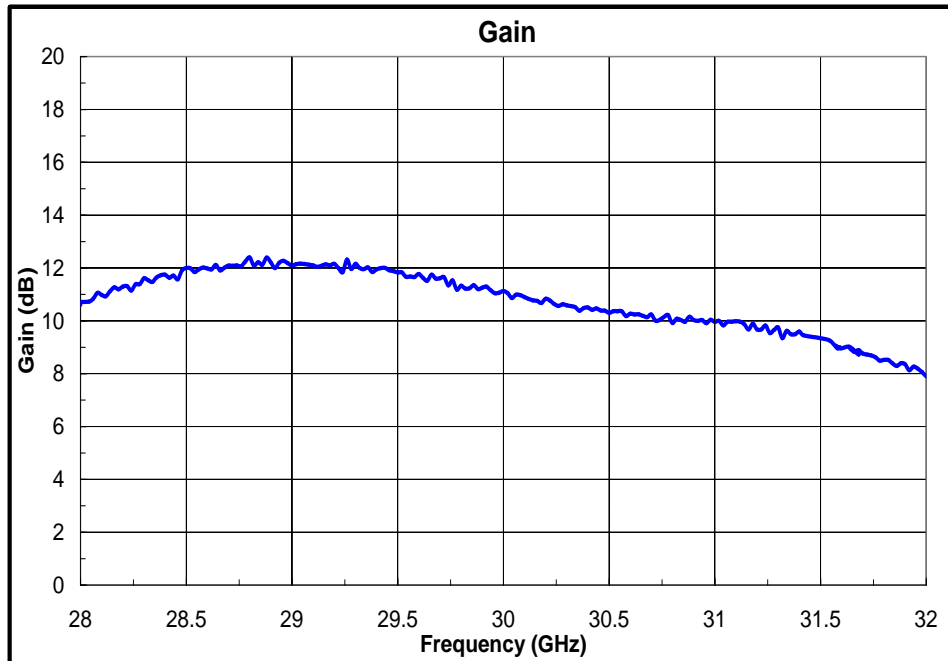
Parameter	Typ.	Units
Frequency Range	29 - 31	GHz
Gain	11	dB
Gain Flatness	+/-1	dB
Output Power (P1 dB)	27	dBm
Input Return Loss	7	dB
Output Return Loss	10	dB
Saturated output power (Psat)	29	dBm
Output Third Order Intercept (IP3)	37	dBm
Power Added Efficiency (PAE)	30%	--
Supply Current	330	mA

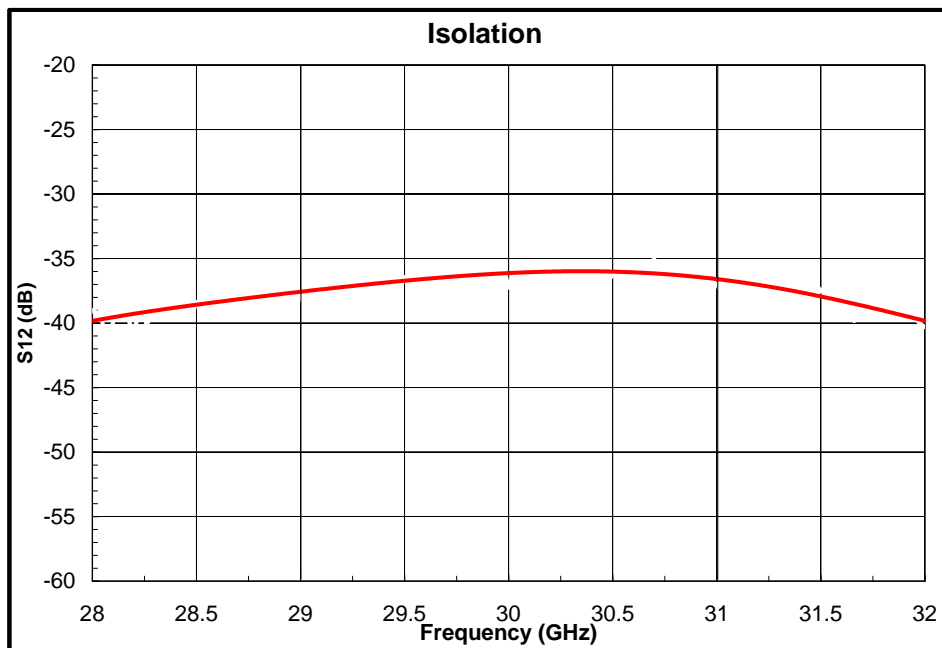
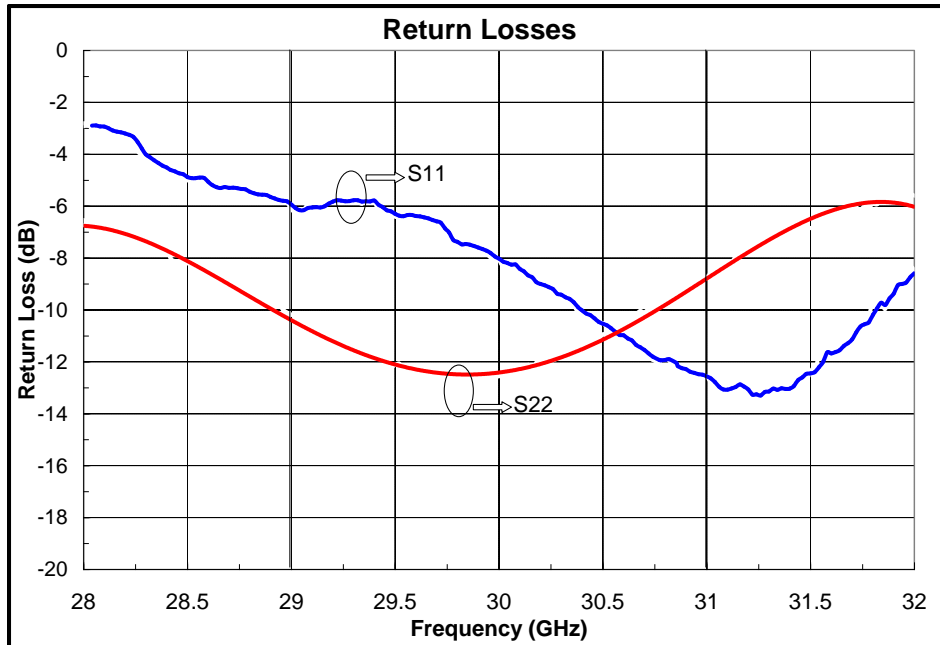
Note:

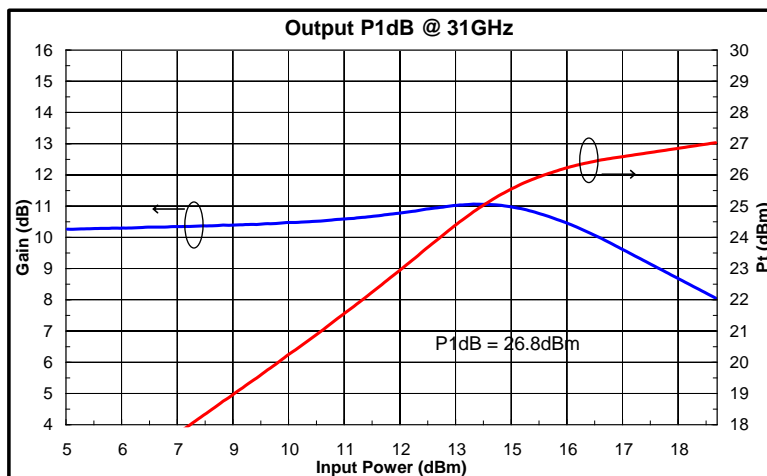
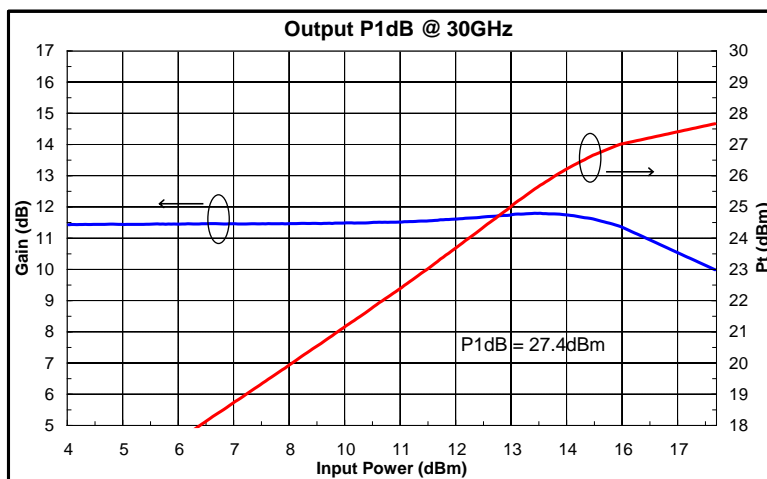
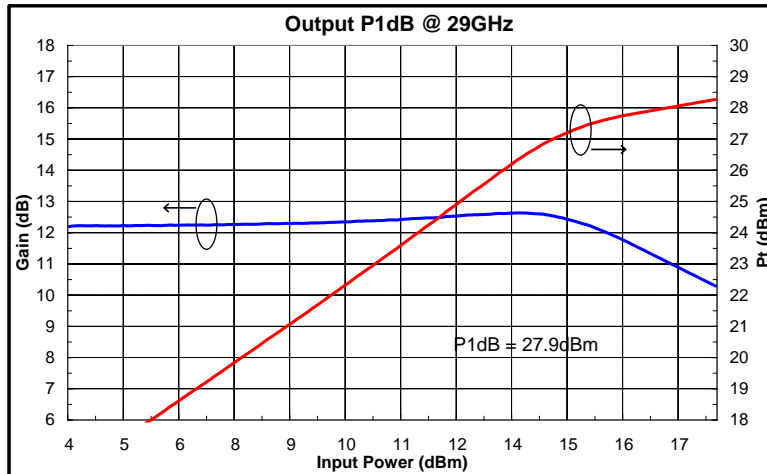
1. Electrical specifications as measured in test fixture.

Test fixture data

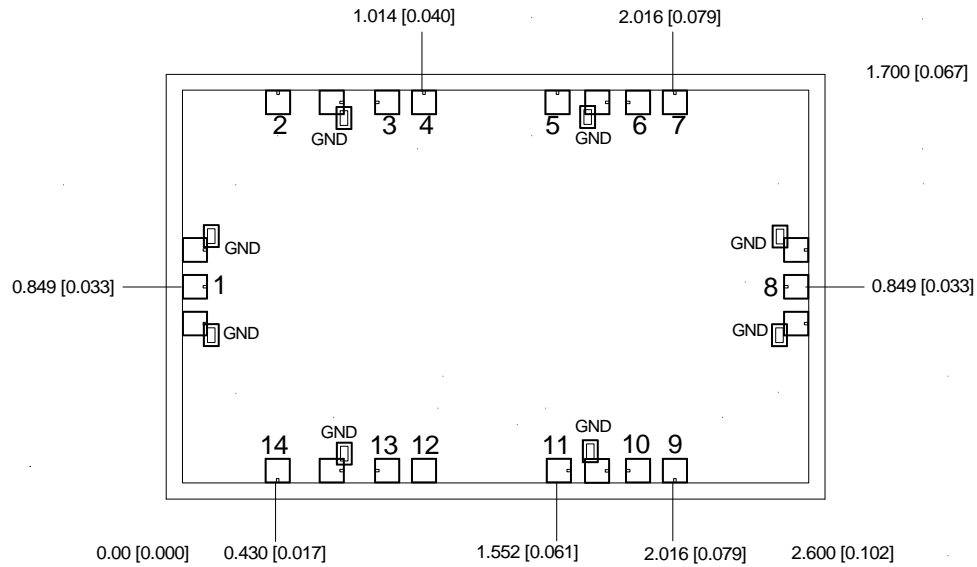
$V_{d1} = V_{d2} = 5V$, $V_{g1} = V_{g2} = -0.75V$, Total Current = 330ma, $T_A = 25\text{ }^\circ\text{C}$



Test fixture data
 $V_{d1} = V_{d2} = 5V, V_{g1} = V_{g2} = -0.75V, \text{Total Current} = 330ma, T_A = 25^\circ C$


Test fixture data
 $V_{d1} = V_{d2} = 5V, V_{g1} = V_{g2} = -0.75V, \text{Total Current} = 330\text{ma}, T_A = 25^\circ\text{C}$


Mechanical Characteristics



Units: millimeters (inches)

Note:

1. All RF and DC bond pads are 100 μ m x 100 μ m
2. Pad no. 1 : RF IN
3. Pad no. 4 : 1st stage drain voltage(V_{d1})
4. Pad no. 8 : RF Output
5. Pad no. 7,9 : 2nd stage drain voltage(V_{d2})
6. Pad no. 11 : 2nd stage gate voltage(V_{g2})
7. Pad no. 14 : 1st stage gate voltage (V_{g1})
8. Pad nos. 2,3,5,6,10,12,13 : NC

