

GaN 70-105 GHz PA

Preliminary Datasheet

Product Features

- Frequency Range: 70-105 GHz
- Pout: 20 dBm
- Gain: 15 dB
- PAE: 5%
- Bias: Vd=12V, Id=90 mA
- Chip dimensions:
2.23 x 2.18 x 0.05 mm

Primary Applications

- W-band high data rate wireless links
- Sensors and Radars

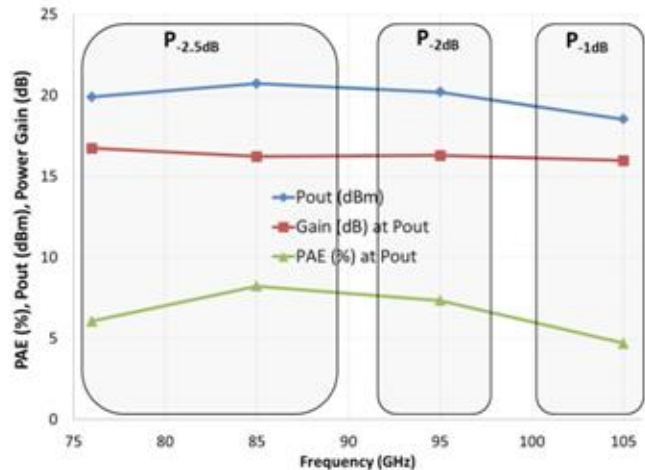
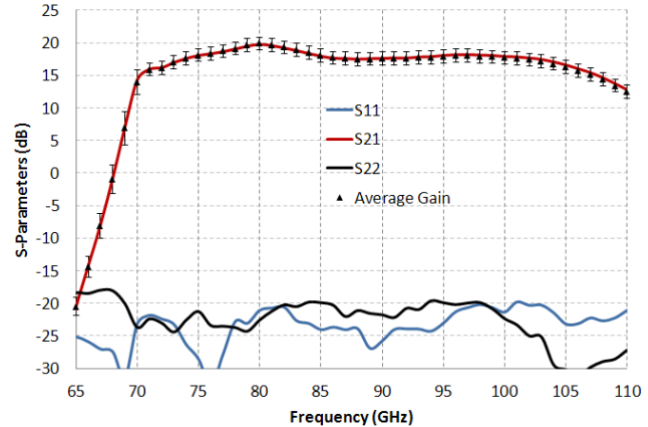
Product Description

The HRL BAL-WPA is a balanced four stage power amplifier fabricated using HRL's T-gate GaN HEMT process (GaN-on-SiC). Front-side bond pads (RF and DC) and backside metallization are Ti/Au, which is compatible with conventional wire and ribbon bonding techniques, and die attach processes.

The BAL-WPA typically provides 20 dBm output power with 12 dB associated gain and a PAE of 11% at 90 GHz.

Typical Measured Performance

Vd=12V, Id=90 mA



Compression level limited by test equipment

Electrical Specifications

Vd=12V, Id=90 mA

Specification	Min	Typ	Max	Unit
Frequency	70		105	GHz
Linear Gain		15		dB
Input Return Loss		20		dB
Output Return Loss		20		dB
Output Power		20		dBm

Disclosure Information: This document is for information only. HRL Laboratories reserves the right to change without notice the characteristic data and other specifications as they apply to the product(s). The product(s) represented by this document is subject to U.S. Export Law as contained in ITAR or the EAR regulations. HRL Laboratories makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does HRL Laboratories assume any liability whatsoever arising out of the use or application of any product(s) or information.
6/28/2019

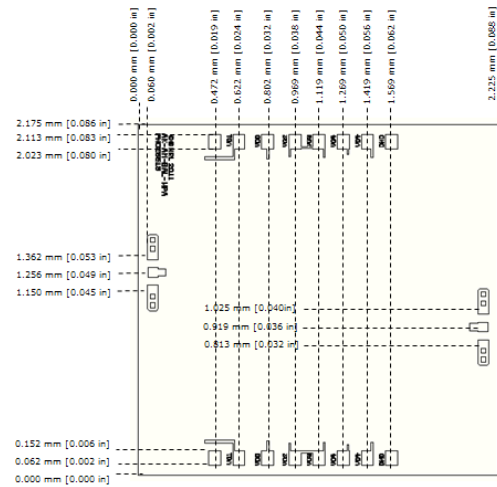
Absolute Maximum Ratings CW Operation

Parameter	Rating	Unit
Input Power (Pin)	10	dBm
Drain Voltage (Vd)	12	V
Gate Voltage Range (Vg)	-1 to -3.5	V
Drain Current (Id)	140	mA
Die Attach Temperature (30 sec)	290	°C

Exceeding any one or combination of the Absolute Maximum Ratings may result in permanent damage to the device. Application of Absolute Maximum Ratings on the device for an extended period of time may negatively affect the reliability of the device.

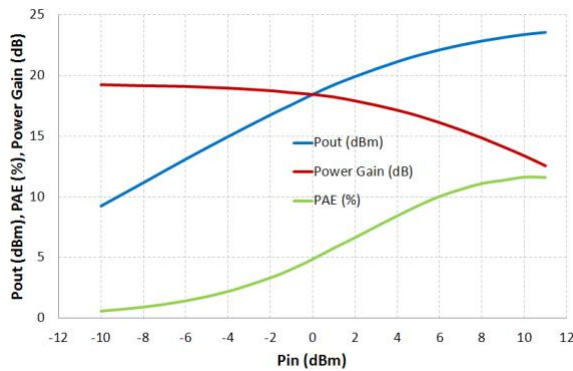
Caution: ESD sensitive device.

Outline Drawing



DC Bond Pads are 0.09x0.075 mm; Bond pad locations shown from die etch to pad center.

Pout, PAE and Gain vs. Pin at 90 GHz



Biasing Procedure

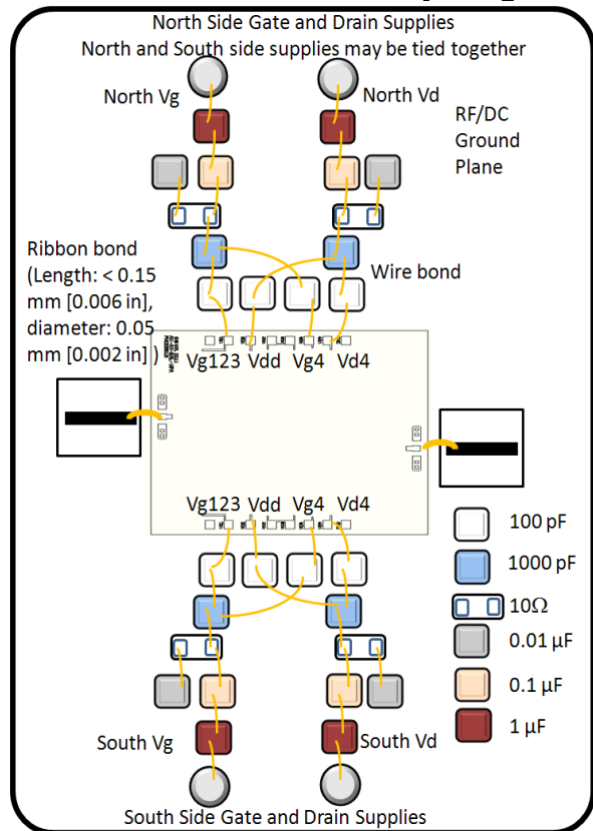
Turn on

- 1) $V_g = -6\text{ V}$
- 2) $V_d = 12\text{ V}$
- 3) Adjust V_g to obtain $I_d = 90\text{ mA}$ (North and South drain supplies tied together).

Turn off

- 1) $V_d = 0\text{ V}$
- 2) $V_g = 0\text{ V}$

Recommended Assembly Diagram



HRL recommends mounting the die on CuW heat spreader using AuSn eutectic solder.

Disclosure Information: This document is for information only. HRL Laboratories reserves the right to change without notice the characteristic data and other specifications as they apply to the product(s). The product(s) represented by this document is subject to U.S. Export Law as contained in ITAR or the EAR regulations. HRL Laboratories makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does HRL Laboratories assume any liability whatsoever arising out of the use or application of any product(s) or information.

Disclosure Information: This document is for information only. HRL Laboratories reserves the right to change without notice the characteristic data and other specifications as they apply to the product(s). The product(s) represented by this document is subject to U.S. Export Law as contained in ITAR or the EAR regulations. HRL Laboratories makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does HRL Laboratories assume any liability whatsoever arising out of the use or application of any product(s) or information.
6/28/2019