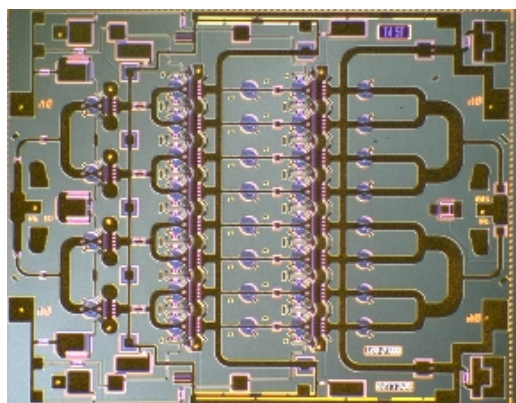


## 33-36 GHz 2W Power Amplifier

## TGA1141



Chip Dimensions 4.13 mm x 3.3 mm

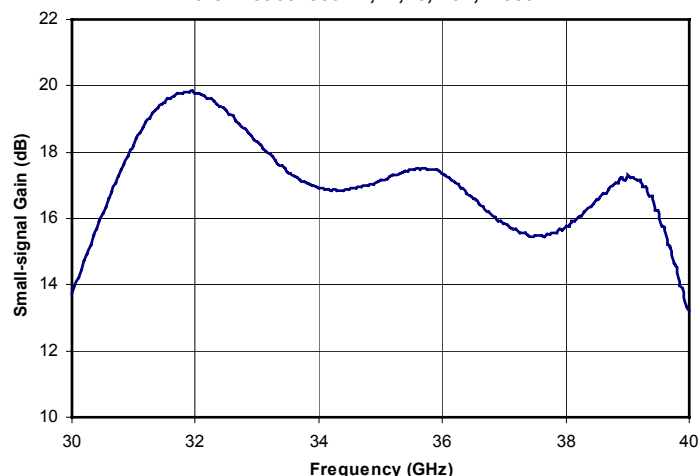
### Key Features

- 0.25 um pHEMT Technology
- 17 dB Nominal Gain
- 31 dBm Pout @ P1dB,
- Psat 33dBm @ 6V , 34dBm @7V
- Bias 6 - 7V @ 1.5A

### Primary Applications

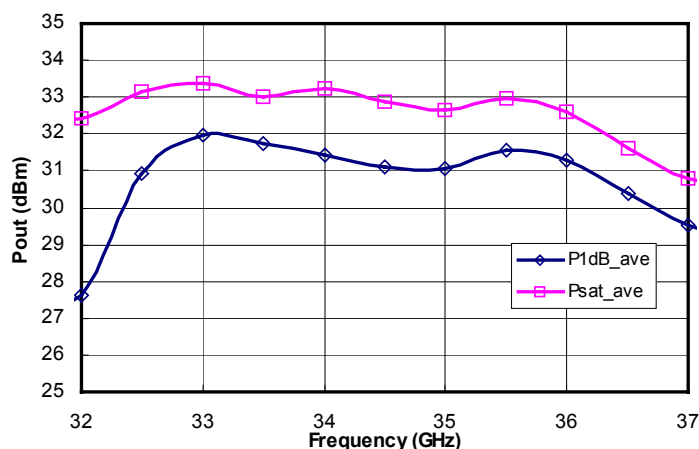
- Military Radar Systems
- Ka Band Sat-Com
- Point-to-Point Radio

Wafer Lot 9918802-1, -2, -3, +6V, ~ 880mA



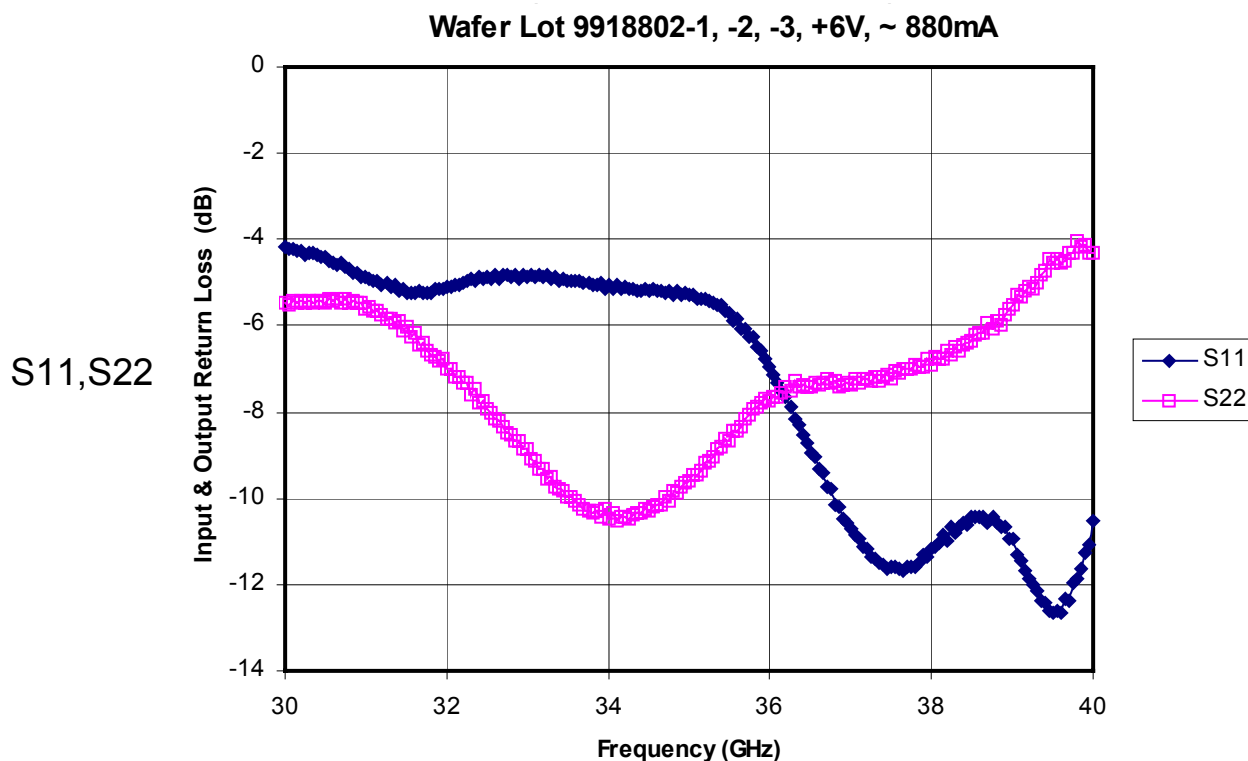
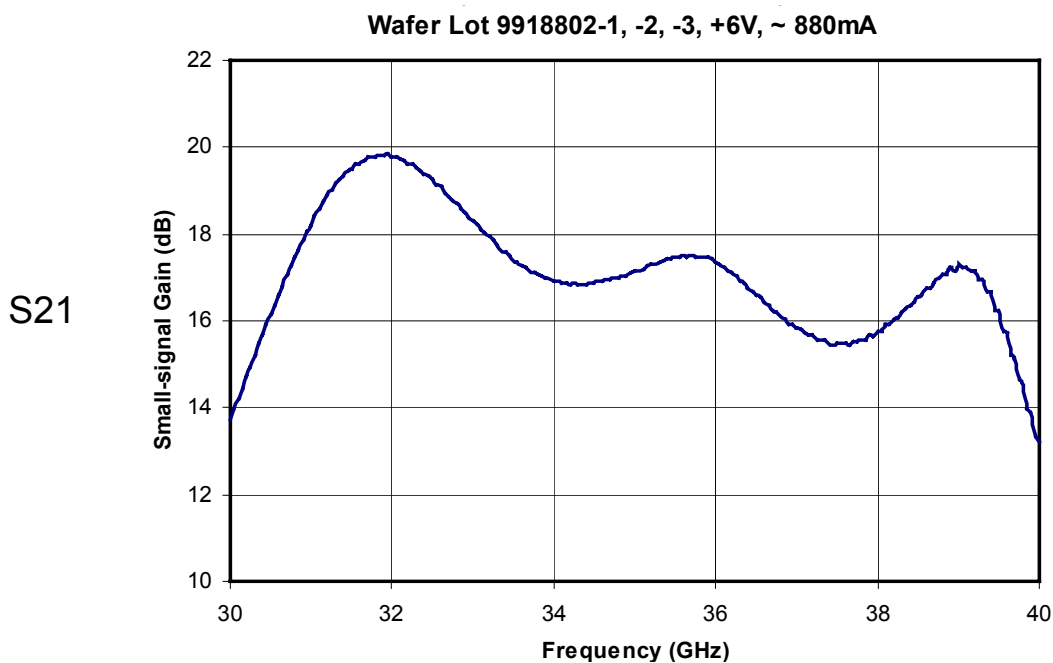
Performance Summary Table

| Description                 | Performance Evaluation<br>Fixtured with Flare TFNs                        |
|-----------------------------|---|
| Frequency range             | 33 to 36 GHz  |
| Small signal gain           | > 17 dB nom, 34 - 35.2 GHz<br>> 17 dB nom, 33 - 36 GHz                    |
| Input return loss           | ~ 5 dB nom, 34 - 35.2 GHz<br>~ 5 dB nom. 33 - 36 GHz                      |
| Output return loss          | > 8 dB nom, 34 - 35.2 GHz<br>> 7 dB nom, 33 - 36 GHz                      |
| Output power                | 32.3dBm min. 34 -35.2 GHz<br><br>31.5dBm min, 34 - 35.2 GHz<br>over temp. |
| PAE                         | > 20% +25C  |
| Operating temperature range | Tested under -26, +25, &<br>+100C<br>Predict: -43C                        |
| Ids                         | < 1.5 A max over operating<br>frequency and Temp. range                   |
| Vds                         | + 6 V   |
| Die size                    | 4.134 mm x 3.300 mm<br>13.6mm <sup>2</sup>                                |



*Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice*

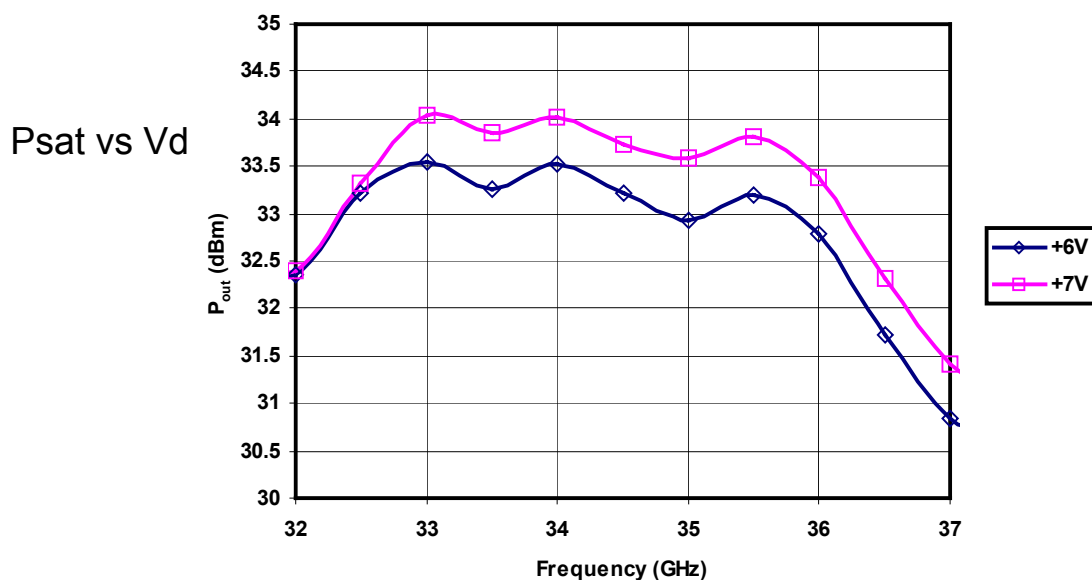
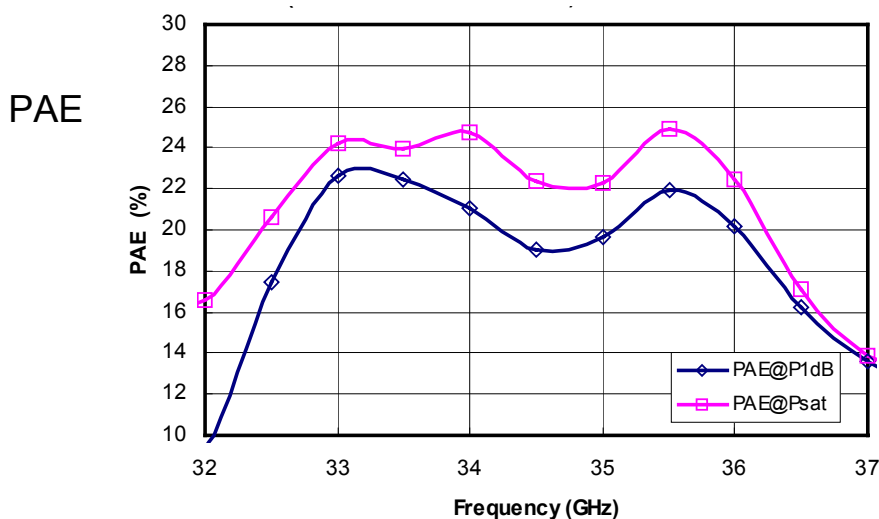
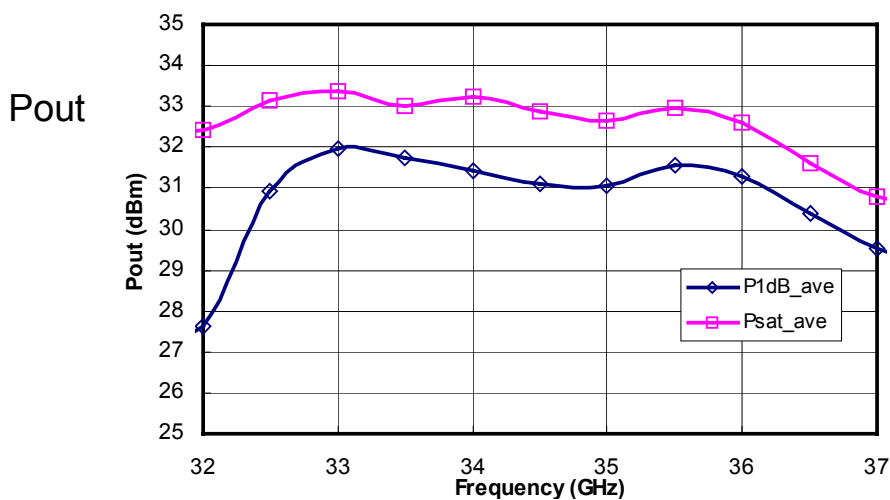
**Measured Average Small Signal Data**



*Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.*

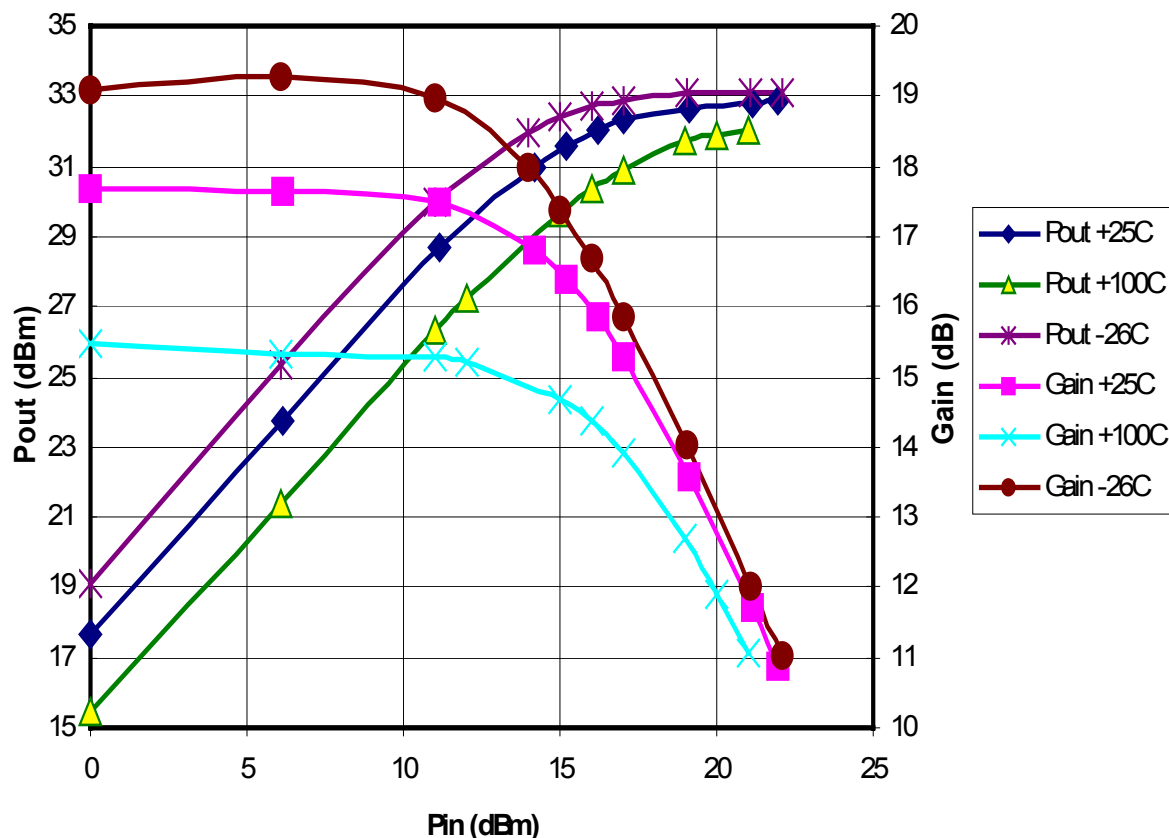
**TGA1141**

**Measured Power Data**



*Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.*

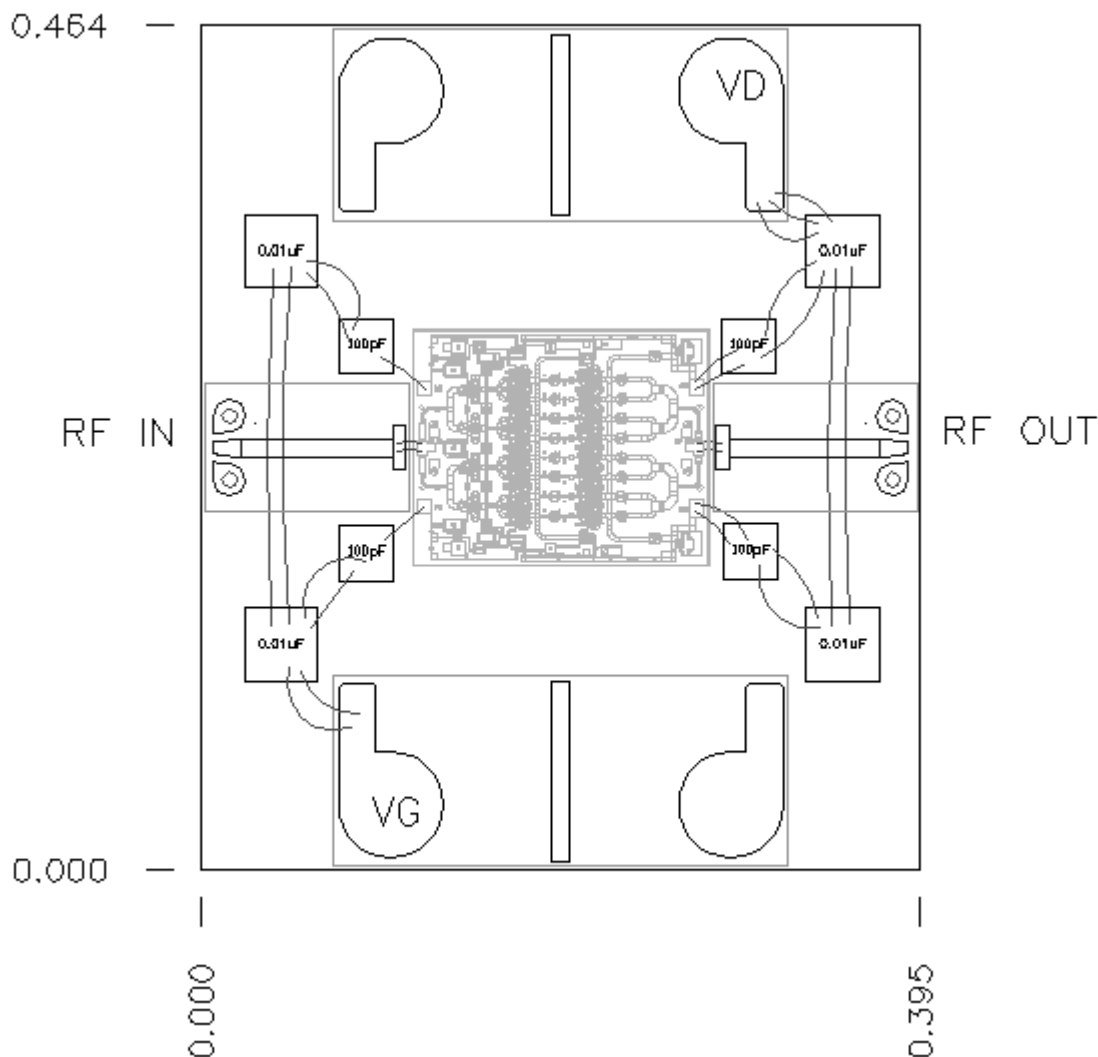
**Pout, Gain vs. Pin at -26C, +25C and +100C**  
w9918802-1 Dev 2505: 34.0GHz +6V



**Pout vs. Temperature Data Summary Matrix:**

|                 | T= -26C  |           | T= +25C  |           | T= +100C |           |
|-----------------|----------|-----------|----------|-----------|----------|-----------|
| Freq (GHz)      | min Pout | mean Pout | min Pout | mean Pout | min Pout | mean Pout |
| 34              | 33       | 33        | 32.7     | 32.8      | 31.9     | 32        |
| 34.6            | 32.8     | 32.9      | 32.5     | 32.6      | 31.7     | 31.8      |
| 35.2            | 32.5     | 32.7      | 32.3     | 32.4      | 31.5     | 31.6      |
| Ave. Pout (dBm) | 32.8     | 32.9      | 32.5     | 32.6      | 31.7     | 31.8      |

*Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.*



**Chip Assembly and Bonding Diagram**

**GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.**

*Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice.*

## Assembly Process Notes

Reflow process assembly notes:

- AuSn (80/20) solder with limited exposure to temperatures at or above 300 °C
- alloy station or conveyor furnace with reducing atmosphere
- no fluxes should be utilized
- coefficient of thermal expansion matching is critical for long-term reliability
- storage in dry nitrogen atmosphere

Component placement and adhesive attachment assembly notes:

- vacuum pencils and/or vacuum collets preferred method of pick up
- avoidance of air bridges during placement
- force impact critical during auto placement
- organic attachment can be used in low-power applications
- curing should be done in a convection oven; proper exhaust is a safety concern
- microwave or radiant curing should not be used because of differential heating
- coefficient of thermal expansion matching is critical

Interconnect process assembly notes:

- thermosonic ball bonding is the preferred interconnect technique
- force, time, and ultrasonics are critical parameters
- aluminum wire should not be used
- discrete FET devices with small pad sizes should be bonded with 0.0007-inch wire
- maximum stage temperature: 200 °C

***GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.***

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