

## Ku Band 2 Watt Packaged Amplifier

## TGA2904-FL



### Key Features and Performance

- Frequency Range: 13-17 GHz
- Optimized for VSAT band (13.75-14.5 GHz)
- 33 dB Nominal Gain
- Typical > 33.5 dBm Psat in VSAT band @ 7V
- Bias 5-8 V @ 680 mA (Quiescent)
- 0.5- $\mu$ m pHEMT 3MI Technology
- 10 lead flange packaged
- Package dimensions: 0.70x 0.33 x 0.1 in<sup>3</sup>

### Primary Applications

- VSAT
- Point to Point

### Product Description

The TriQuint TGA2904-FL is a compact 2 Watt High Power Amplifier Packaged MMIC for Ku-band applications. The packaged part provides 33 dB nominal gain.

The part is ideally suited for low cost emerging markets such as base station transmitters for satellite ground terminals and point to point radio.

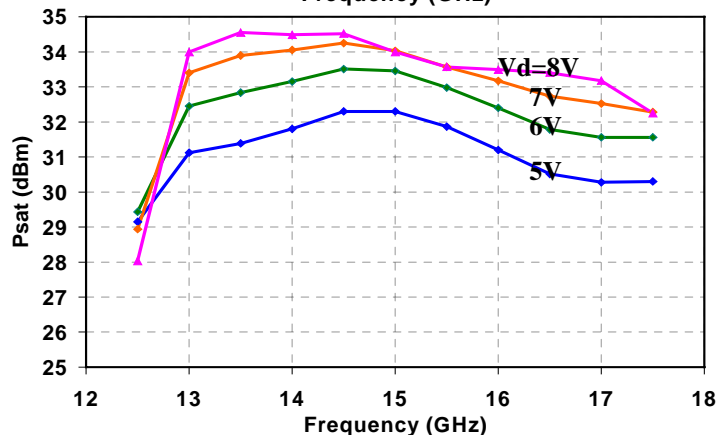
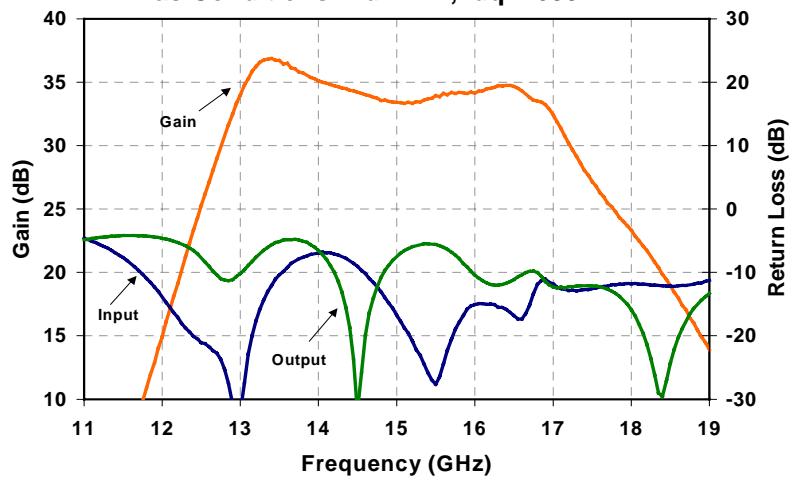
The TGA2904-FL is 100% RF tested to ensure performance compliance.

Lead-Free & RoHS compliant.

Evaluation boards are available.

### Preliminary Measured Performance

Bias Conditions:  $V_d = 7\text{ V}$ ,  $I_{dq} = 680\text{ mA}$



*Note: This device is early in the characterization process prior to finalizing all electrical specifications. Specifications are subject to change without notice.*

**TABLE I**  
**MAXIMUM RATINGS 1/**

| Symbol           | Parameter                            | Value                             | Notes        |
|------------------|--------------------------------------|-----------------------------------|--------------|
| V <sub>d</sub>   | Drain Supply Voltage                 | 8 V                               | <u>2/</u>    |
| V <sub>g</sub>   | Gate Supply Voltage Range            | -5V to 0V                         |              |
| I <sub>dq</sub>  | Drain Supply Current (Quiescent)     | 1.3 A                             | <u>2/</u>    |
| I <sub>g</sub>   | Gate Current                         | 18 mA                             |              |
| P <sub>IN</sub>  | Input Continuous Wave Power          | 21 dBm                            | <u>2/</u>    |
| P <sub>D</sub>   | Power Dissipation                    | 5 W + (85°C - T <sub>B</sub> )/13 | <u>2/ 3/</u> |
| T <sub>CH</sub>  | Operating Channel Temperature        | 150 °C                            | <u>4/ 5/</u> |
| T <sub>M</sub>   | Mounting Temperature<br>(30 Seconds) | 260 °C                            |              |
| T <sub>STG</sub> | Storage Temperature                  | -65 to 150 °C                     |              |

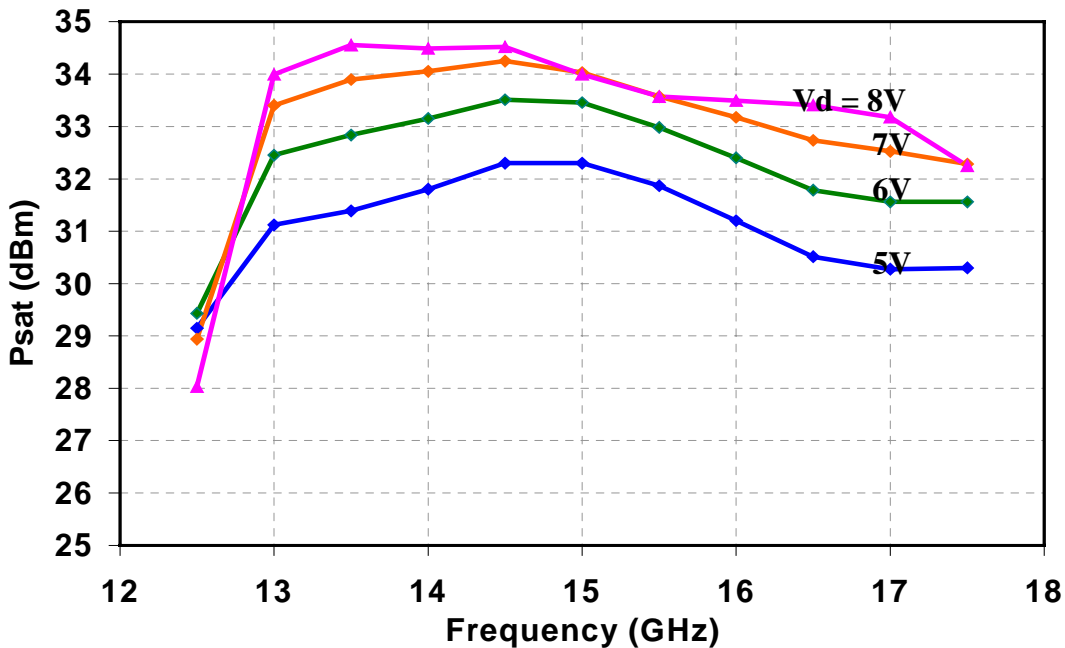
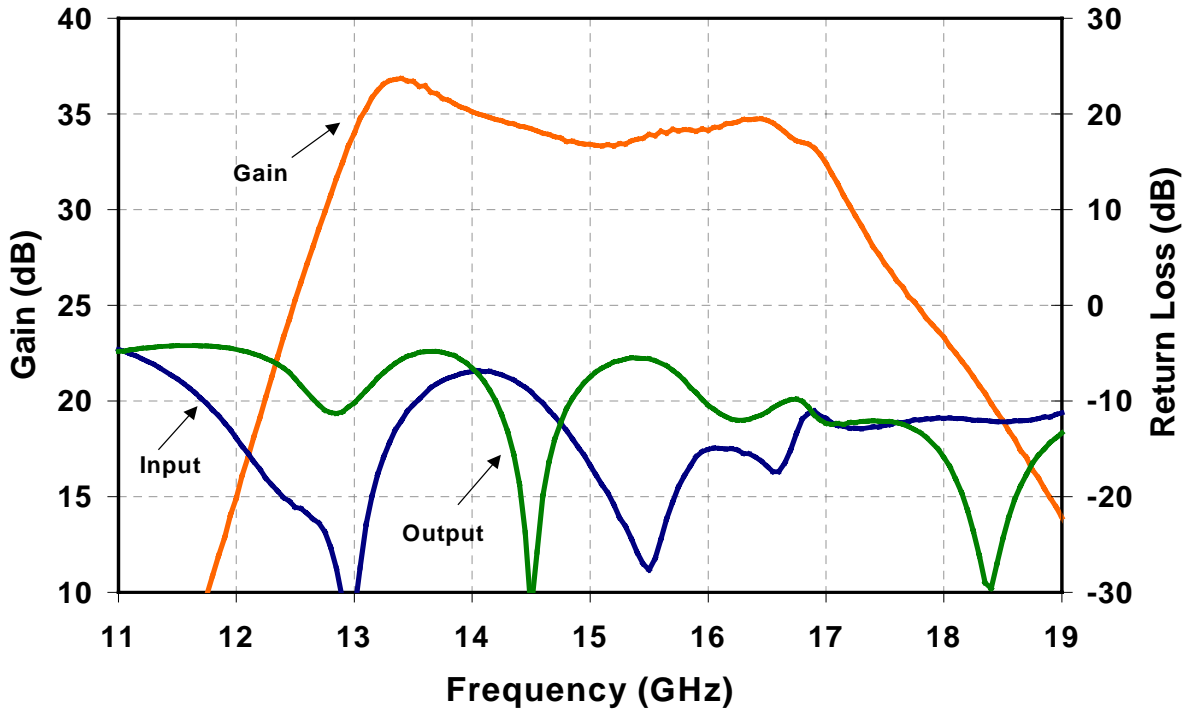
- 1/ These ratings represent the maximum operable values for this device.
- 2/ Combinations of supply voltage, supply current, input power, and output power shall not exceed P<sub>D</sub>.
- 3/ T<sub>B</sub> = Package backside temperature in degrees C.
- 4/ These ratings apply to each individual FET.
- 5/ Junction operating temperature will directly affect the device median time to failure (T<sub>M</sub>). For maximum life, it is recommended that junction temperatures be maintained at the lowest possible levels.

**TABLE II**  
**RF CHARACTERIZATION TABLE**  
(T<sub>A</sub> = 25°C, Nominal)  
(V<sub>d</sub> = 7 V, I<sub>dq</sub> = 680 mA)

| SYMBOL | PARAMETER                   | TEST CONDITION | TYPICAL | UNITS |
|--------|-----------------------------|----------------|---------|-------|
| Gain   | Small Signal Gain           | F = 13 –17 GHz | 33      | dB    |
| IRL    | Input Return Loss           | F = 13 –17 GHz | 10      | dB    |
| ORL    | Output Return Loss          | F = 13 –17 GHz | 10      | dB    |
| PWR    | Output Power @ Pin = +5 dBm | F = 13 –15 GHz | 34      | dBm   |

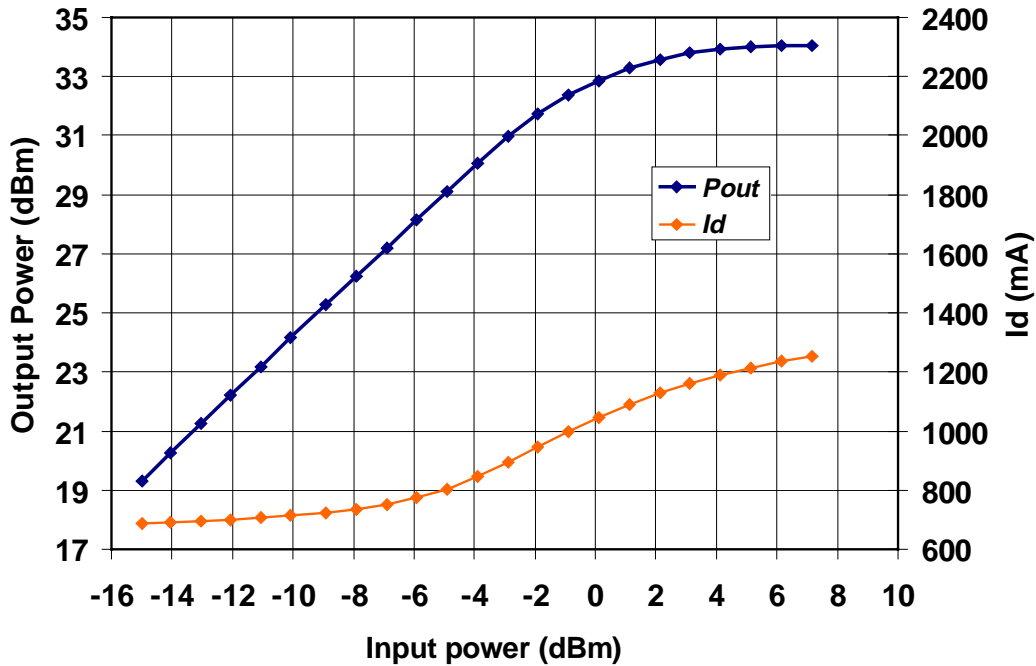
**Typical Fixtured Performance**

Bias Conditions:  $V_d = 7\text{ V}$ ,  $I_{dq} = 680\text{ mA}$

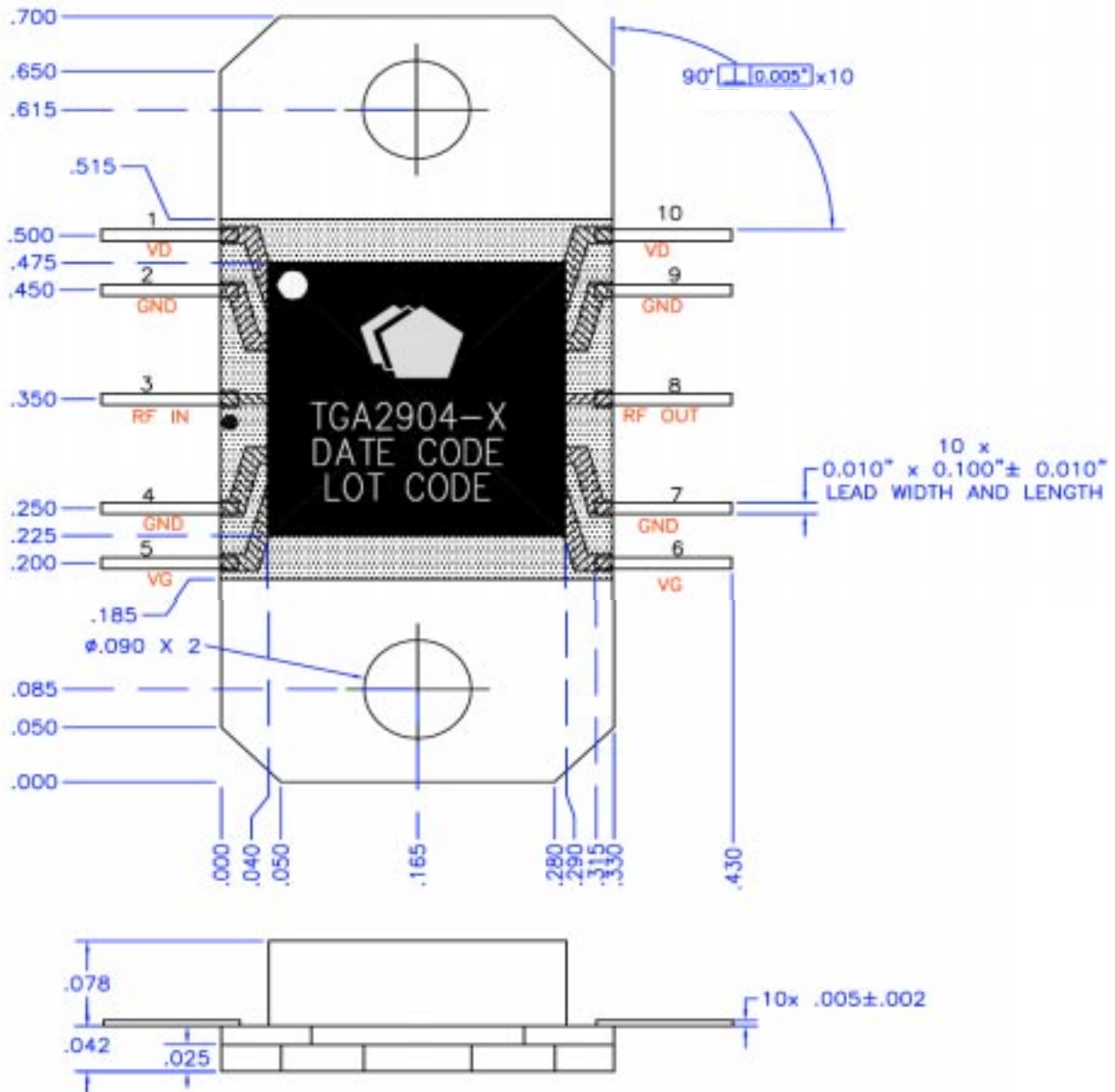


**Typical Fixtured Performance**

Bias Conditions:  $V_d = 7\text{ V}$ ,  $I_{dq} = 680\text{ mA}$ ,  $F = 14\text{ GHz}$

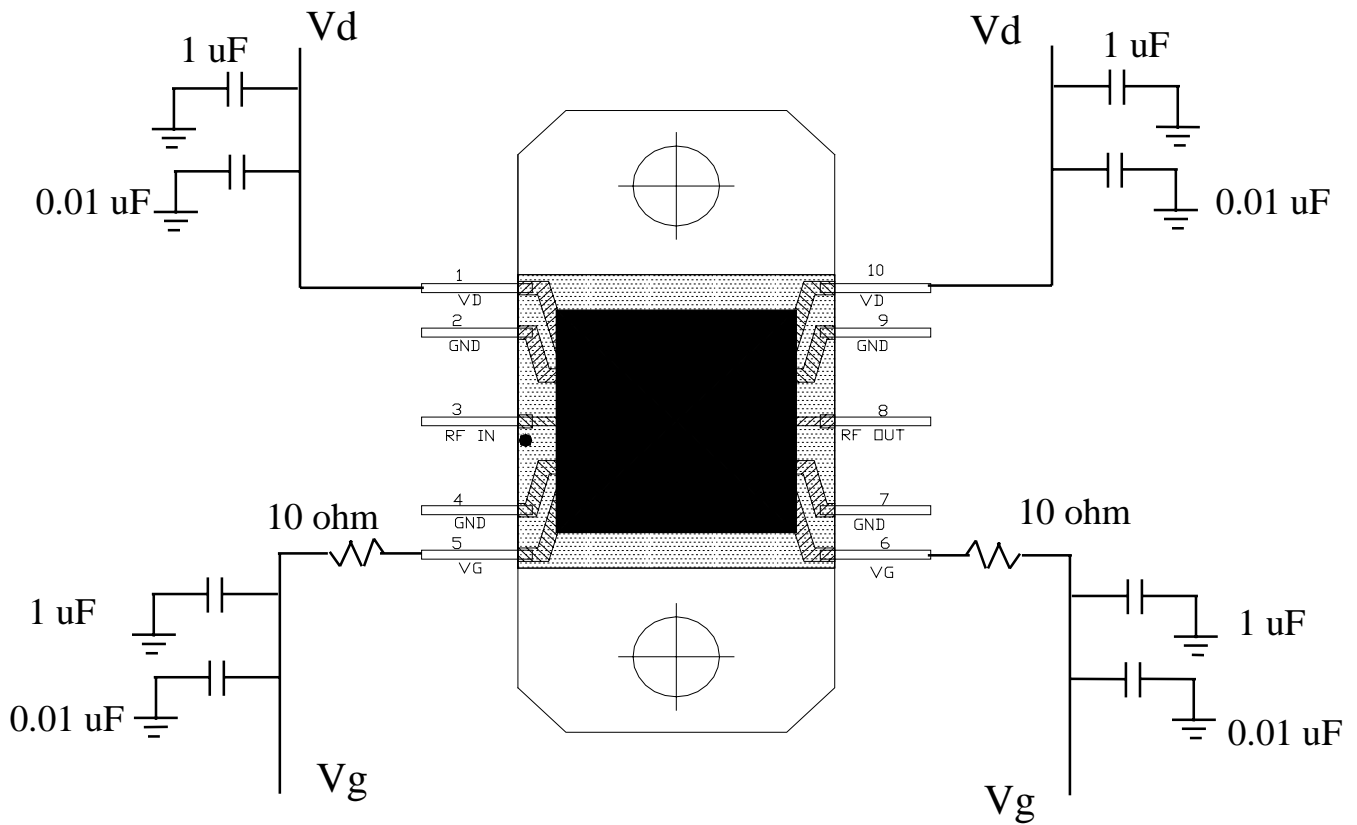


**Mechanical Drawing**



Units: inches  
 Tolerance (unless otherwise noted): +/- 0.005

**Package Assembly Diagram**



## **Assembly of a TGA2904-FL Surface Mount Package onto a Motherboard**

### **Manual Assembly for Prototypes**

1. Clean the motherboard or the similar module with Acetone. Rinse with alcohol and DI water. Allow the circuit to fully dry.
2. To improve the thermal and RF performance, we recommend a heat sink attach to the bottom of the package and apply indium alloy SN63 solder or Tin Lead solder to the bottom of TGA2904-FL
3. Apply Tin Lead solder to each pin of TGA2904-FL.
4. Clean the assembly with alcohol.

### **High Volume Assembly of the Package**

The TGA2904-FL is a custom leaded packaged component. High volume assembly can be performed using standard assembly processes including solder printing such as stencil solder printing. Pick-and-place using a standard machine such as a MRSI machine, and solder reflow using a "Sikama Reflow System" using typical zone temperatures: 120, 175, 195, and 215 degrees Celsius at 15 second intervals.

### **Ordering Information**

| <b>Part</b> | <b>Package Style</b> |
|-------------|----------------------|
| TGA2904-FL  | Flange Lead          |

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