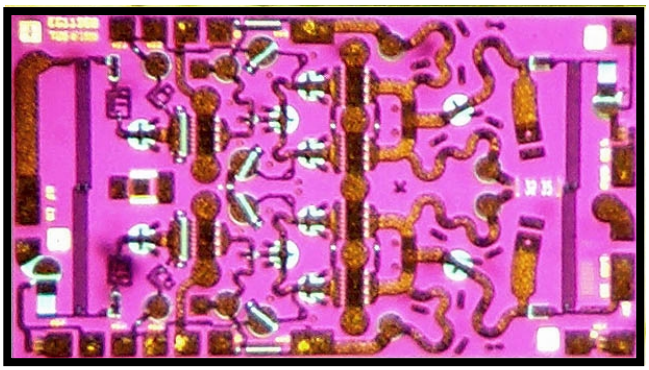
18-27.5 GHz 1W Power Amplifier TGA1135B



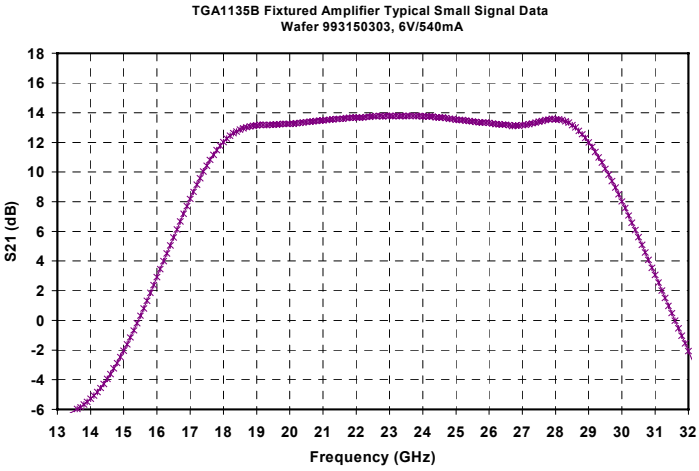
Chip Dimensions 2.641 mm x 1.480 mm

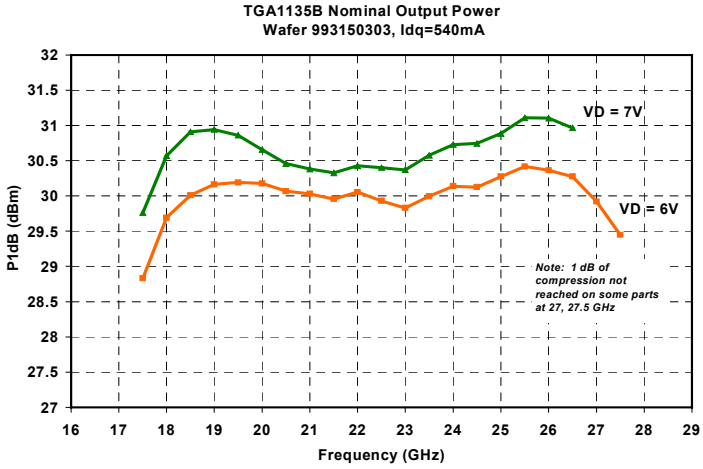
Key Features

- 0.25 um pHEMT Technology
- 14 dB Nominal Gain at 23GHz
- 30 dBm Nominal P1dB
- 38dBm OTOI typical
- Typical 15dB Input/Output RL
- Bias 6 - 7V @ 540 mA
- On-chip power detector diode

Primary Applications

- Point-to-Point Radio
- Point-to-Multipoint Communications
- Ka Band Sat-Com

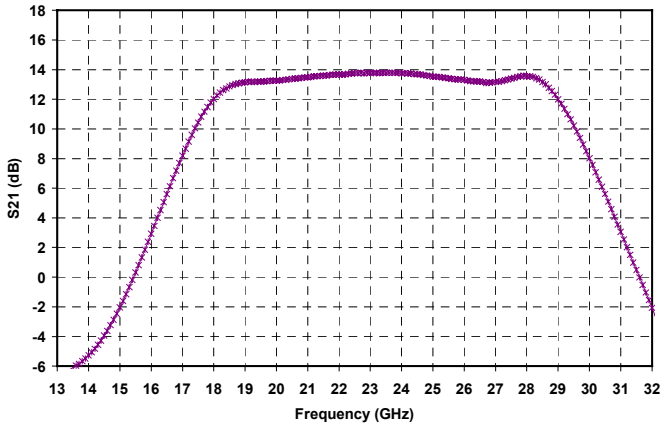




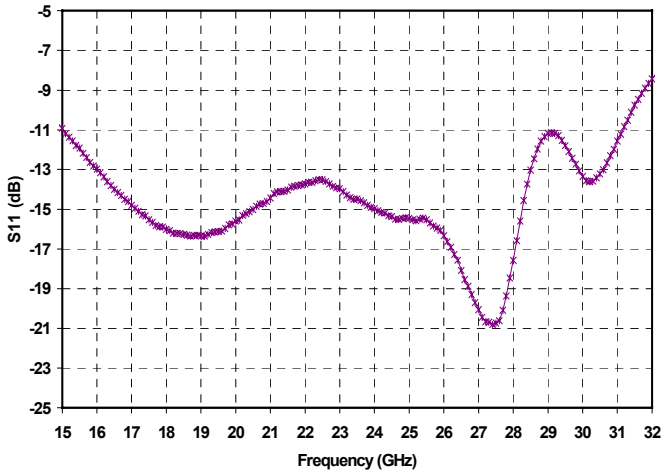
Note: Devices designated as EPU are typically early in their characterization process prior to finalizing all electrical and process specifications. Specifications are subject to change without notice

Measured small signal data
6V, 540mA

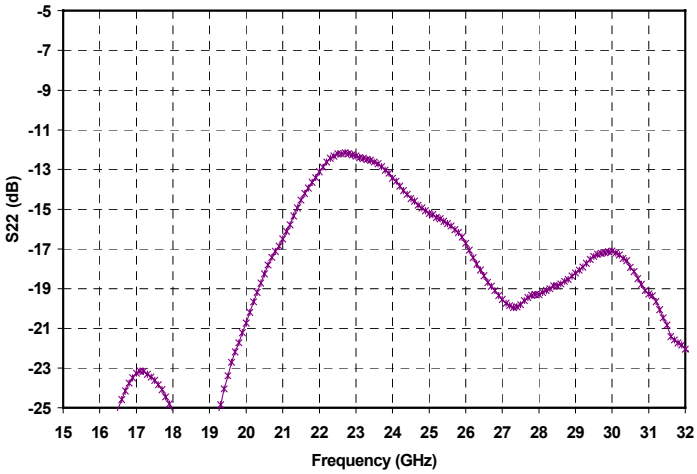
S21



S11



S22



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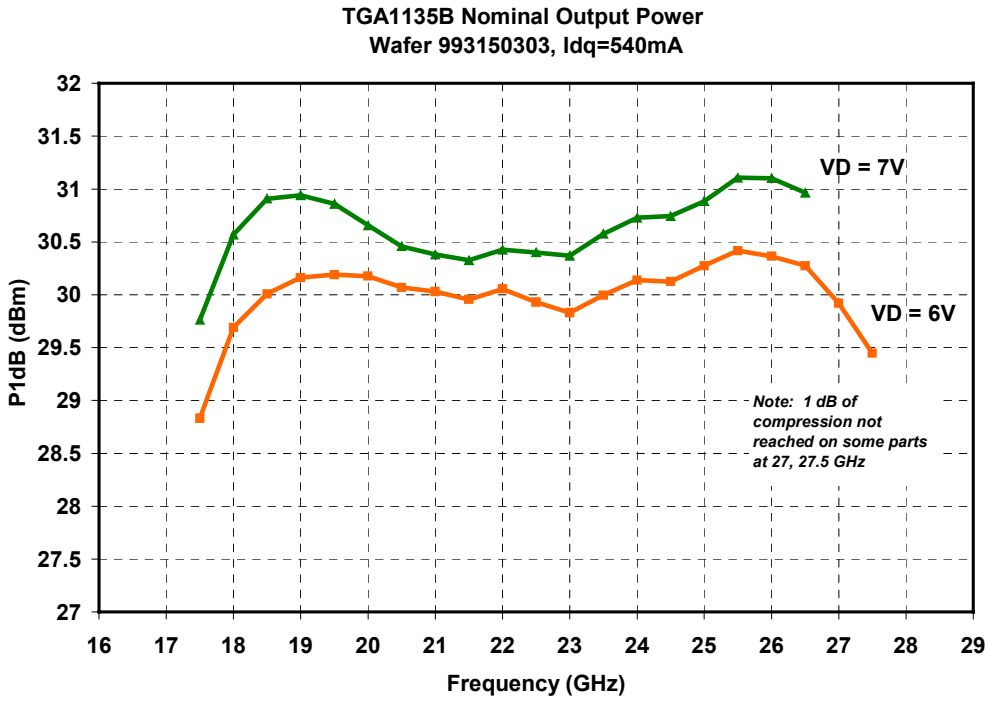
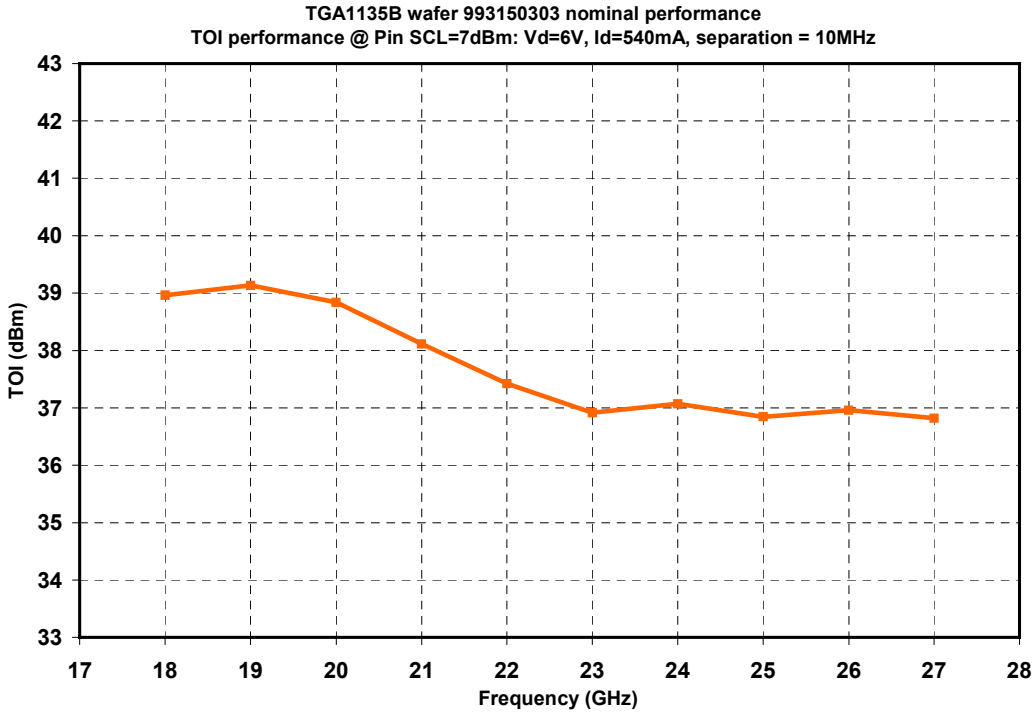


P1dB Measured Data



Output TOI Measured Data

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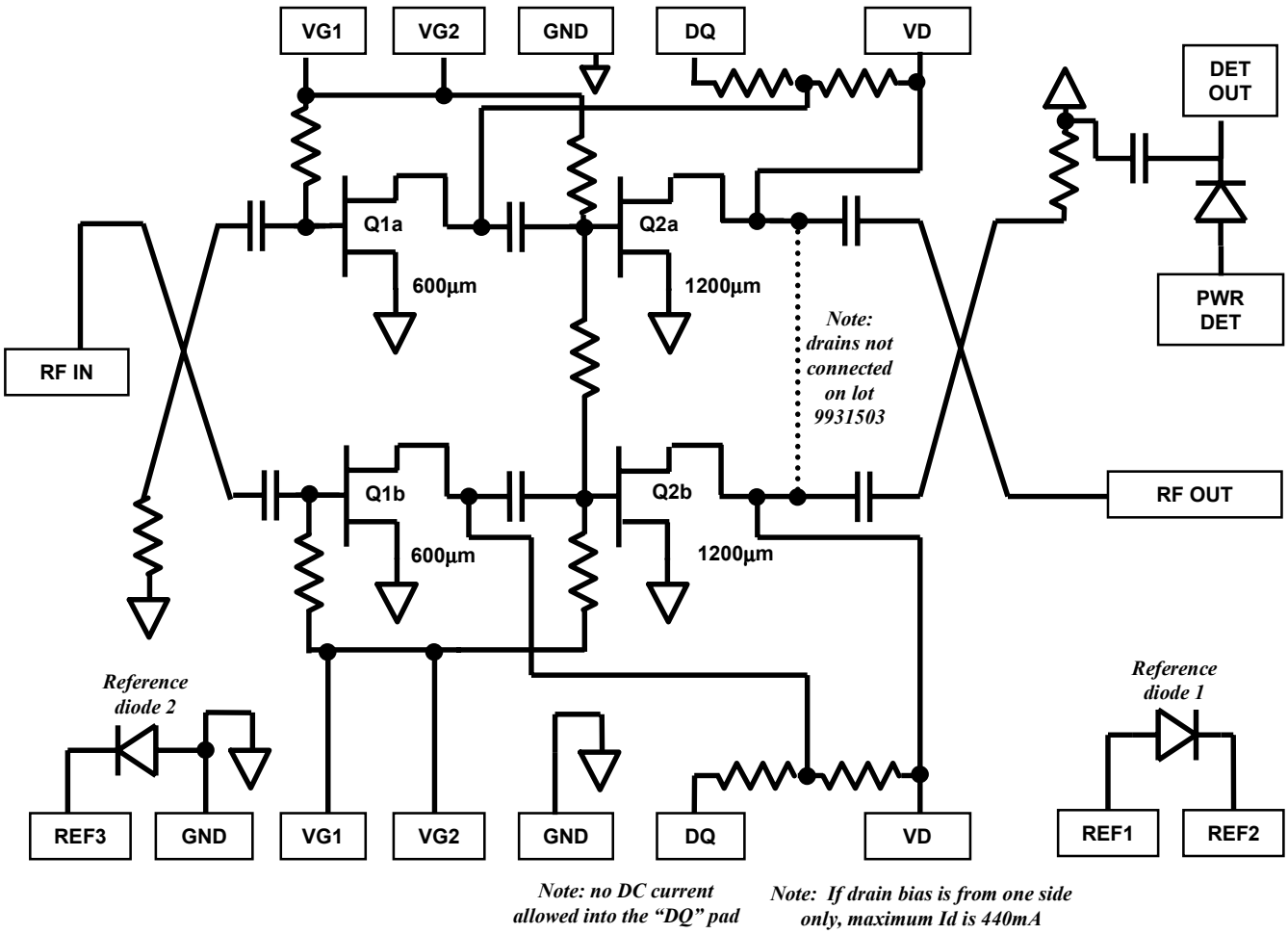

DC Schematic

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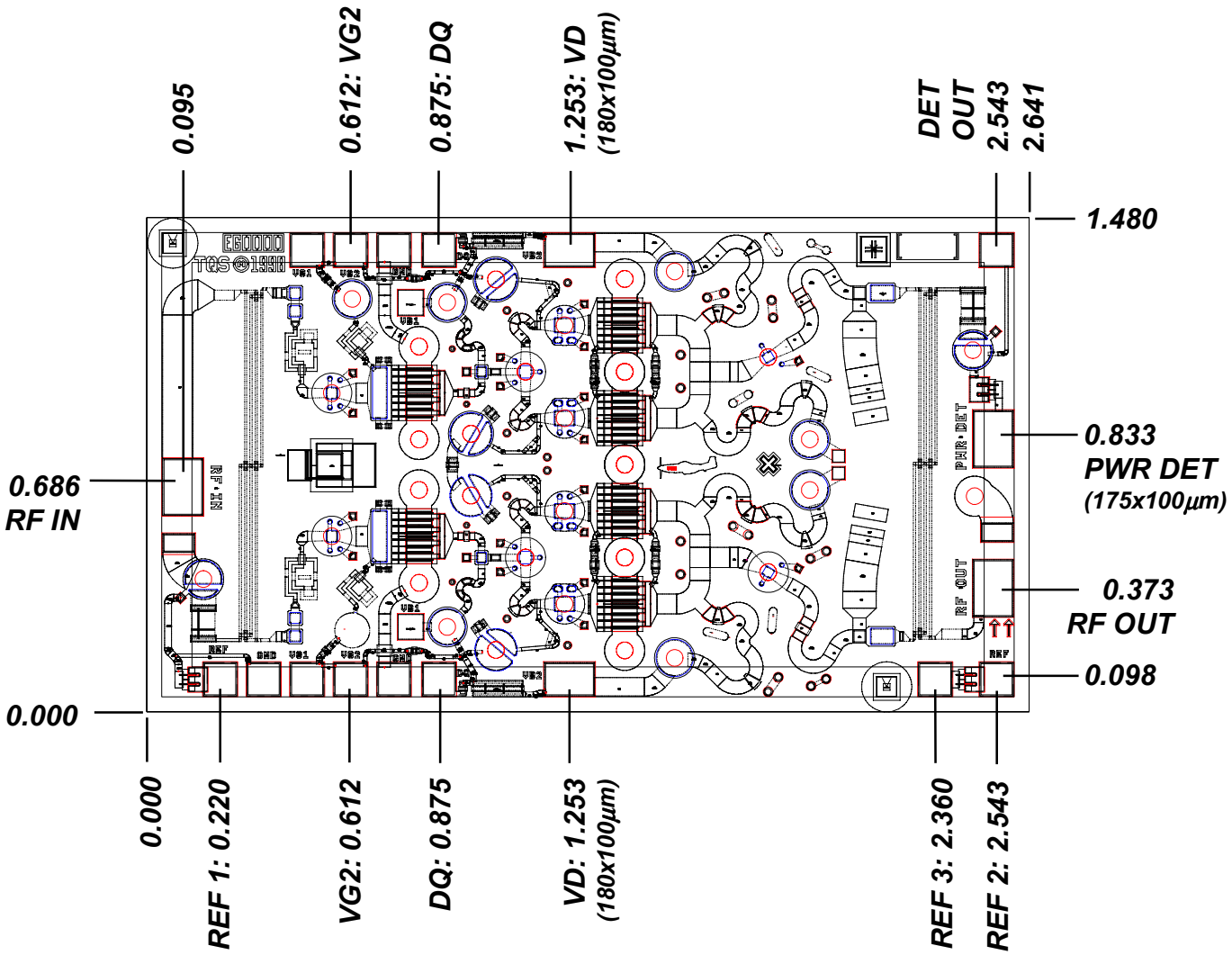

Dimensions in mm
RF I/O Pad: 200x100 mm
DC Pads: 105x105 mm
Die Area: 3.909 mm^2

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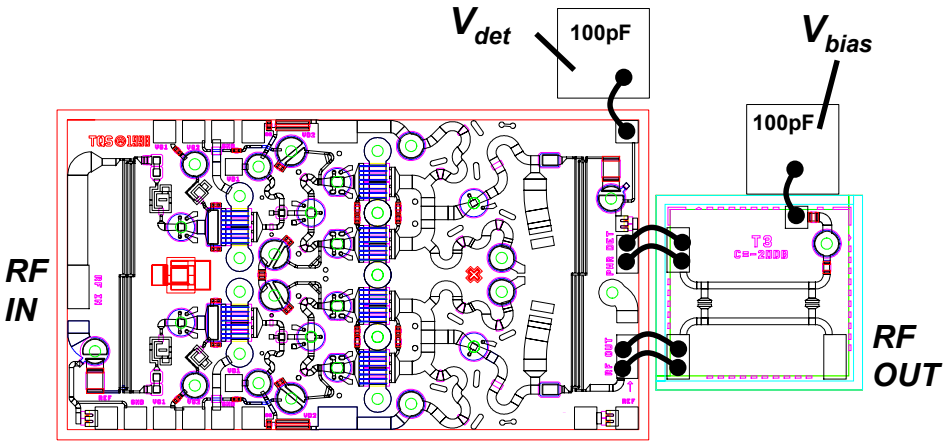
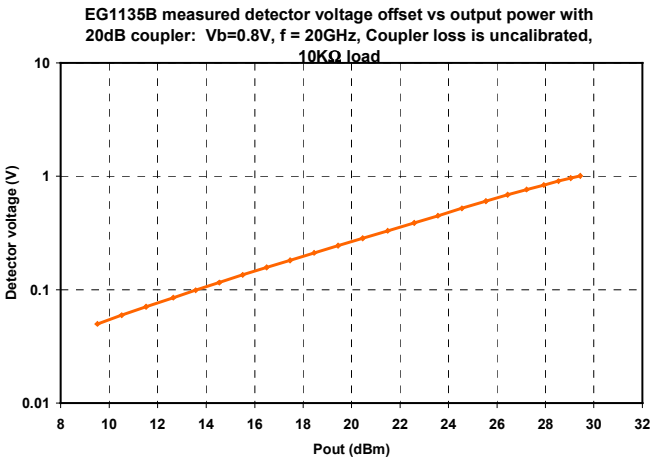
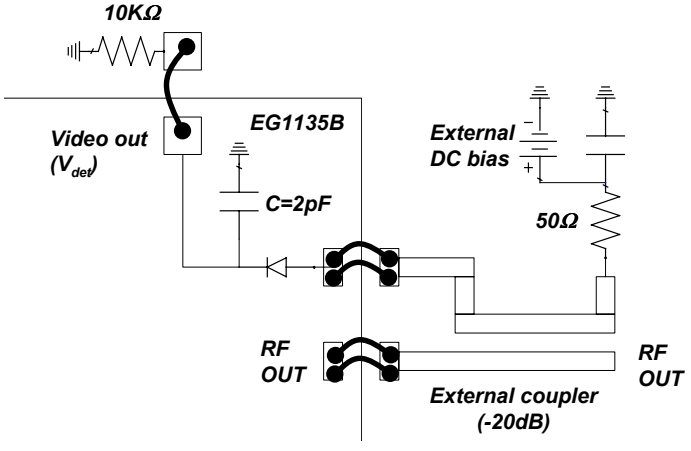
TGA1135B built-in power detector



TGA1135B with external test coupler
(amplifier bias connections not shown)

On-chip diode functions as envelope detector
External coupler and DC bias required





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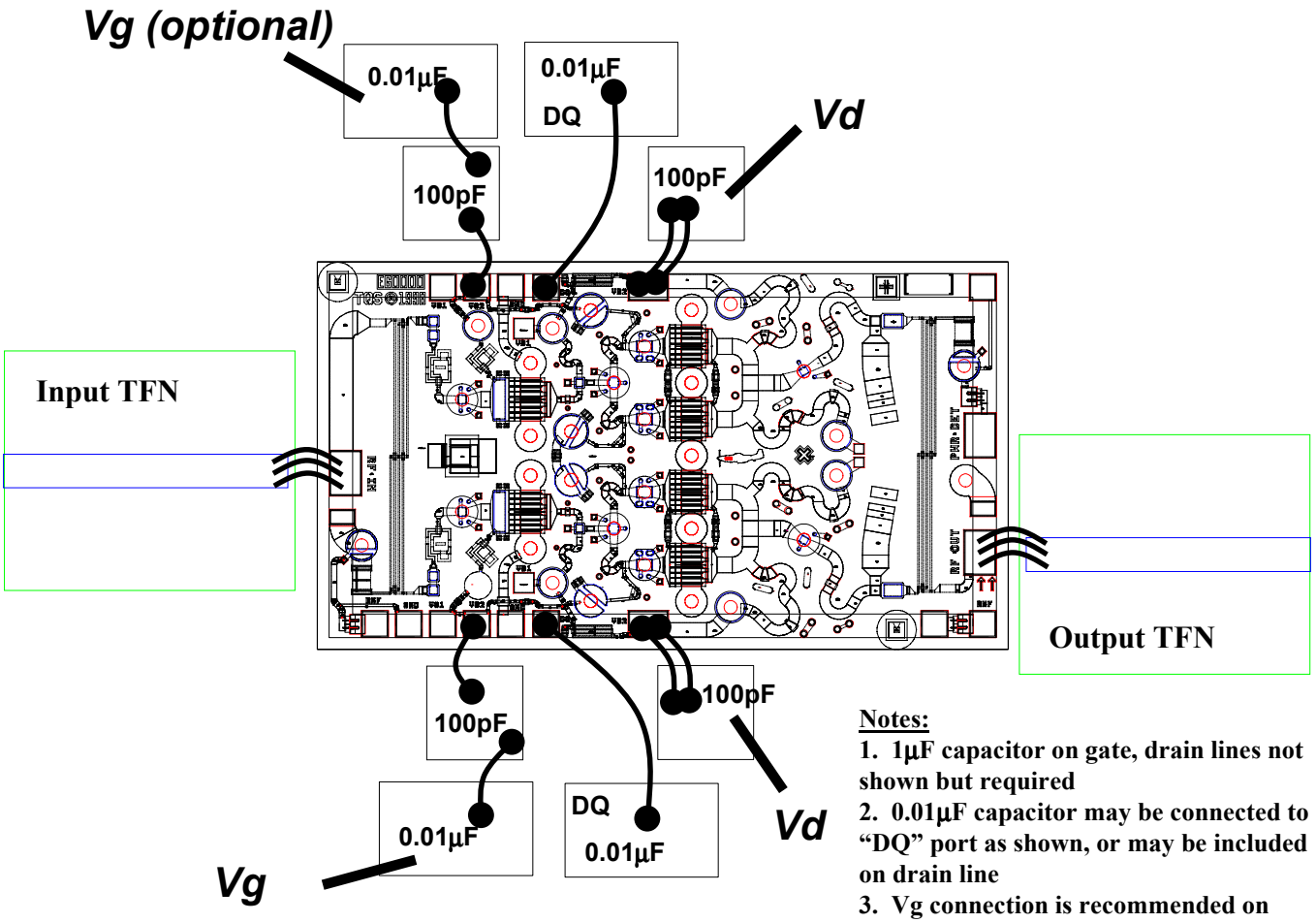

Notes:

1. 1µF capacitor on gate, drain lines not shown but required
2. 0.01µF capacitor may be connected to "DQ" port as shown, or may be included on drain line
3. Vg connection is recommended on both sides for devices operating at or above P1dB

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.

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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

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