TriQuint SEMICONDUCTOR

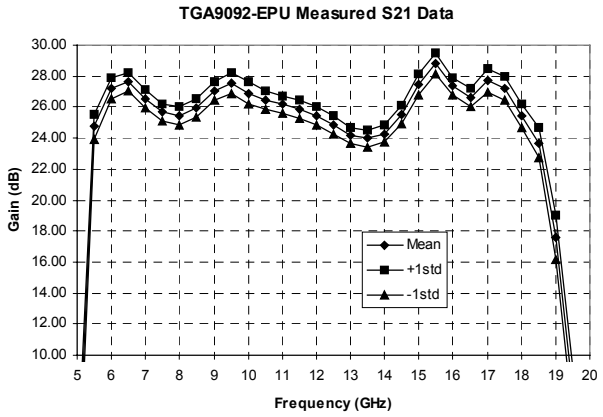
Advance Product Information

May 16, 2001

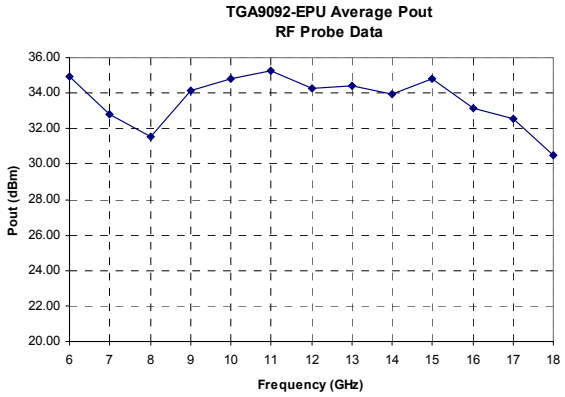
6 - 18 GHz High Power Amplifier TGA9092-EPU

Key Features and Performance

- Dual Channel Power Amplifier
- 0.25um pHEMT Technology
- 6-18 GHz Frequency Range
- 2.8 W/Channel Midband Pout
- 5.6 W Pout Combined
- 25 dB Nominal Gain
- Balanced In/Out for Low VSWR
- 8V @ 1.2A per Channel Bias



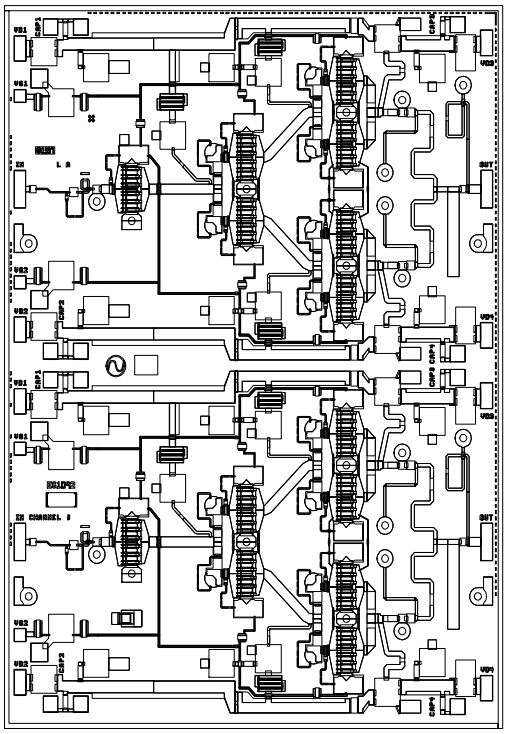
Typical Measured Small Signal Gain



Typical Measured Pout (RF Probe)

Primary Applications

- X-Ku band Power
- Point-to-Point Radio
- VSAT



Chip Dimensions 4.32mm x 5.74mm x 0.100mm

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.

Table I
RECOMMENDED MAXIMUM RATINGS

Symbol	Parameter	Value	Notes
V^+	Positive Supply Voltage	9 V	
I^+	Positive Supply Current	3.5 A	3/
P_D	Power Dissipation	25 Watts	
P_{IN}	Input Continuous Wave Power	25 dBm	
T_{CH}	Operating Channel Temperature	150 °C	1/, 2/
T_M	Mounting Temperature (30 seconds)	320 °C	
T_{STG}	Storage Temperature	-65 °C to 150 °C	

1/ These ratings apply to each individual FET

2/ Junction operating temperature will directly affect the device mean time to failure (MTTF). For maximum life it is recommended that junction temperatures be maintained at the lowest possible levels.

3/ Total current for both channels

Table II
DC PROBE TESTS
(T_A = 25 °C ± 5°C)

Symbol	Parameter	Minimum	Maximum	Value
V_{P1-14}	Pinch-off Voltage	-1.5	-0.5	V
BV_{GS1}	Breakdown Voltage gate-source	-30	-8	V
BV_{GD1-3}	Breakdown Voltage gate-drain	-30	-8	V

Table III
ON-WAFER RF PROBE CHARACTERISTICS
(T_A = 25 °C ± 5°C)

Symbol	Parameter	Test Condition Vd=8V, Id=800mA	Limit			Units
			Min	Nom	Max	
G_p	Small-signal Power Gain	F = 6 to 18 GHz	20	25	-	dB
P_{3dB}	Output Power @ 3dB gain compression	F = 6 to 9 GHz F = 10 to 17 GHz F = 18 Ghz	30 33 30	32 34 33	- - -	dBm
PAE	Power Added Efficiency	F = 6 to 18 GHz	12	25	-	%

Note: RF probe data taken at 1GHz steps

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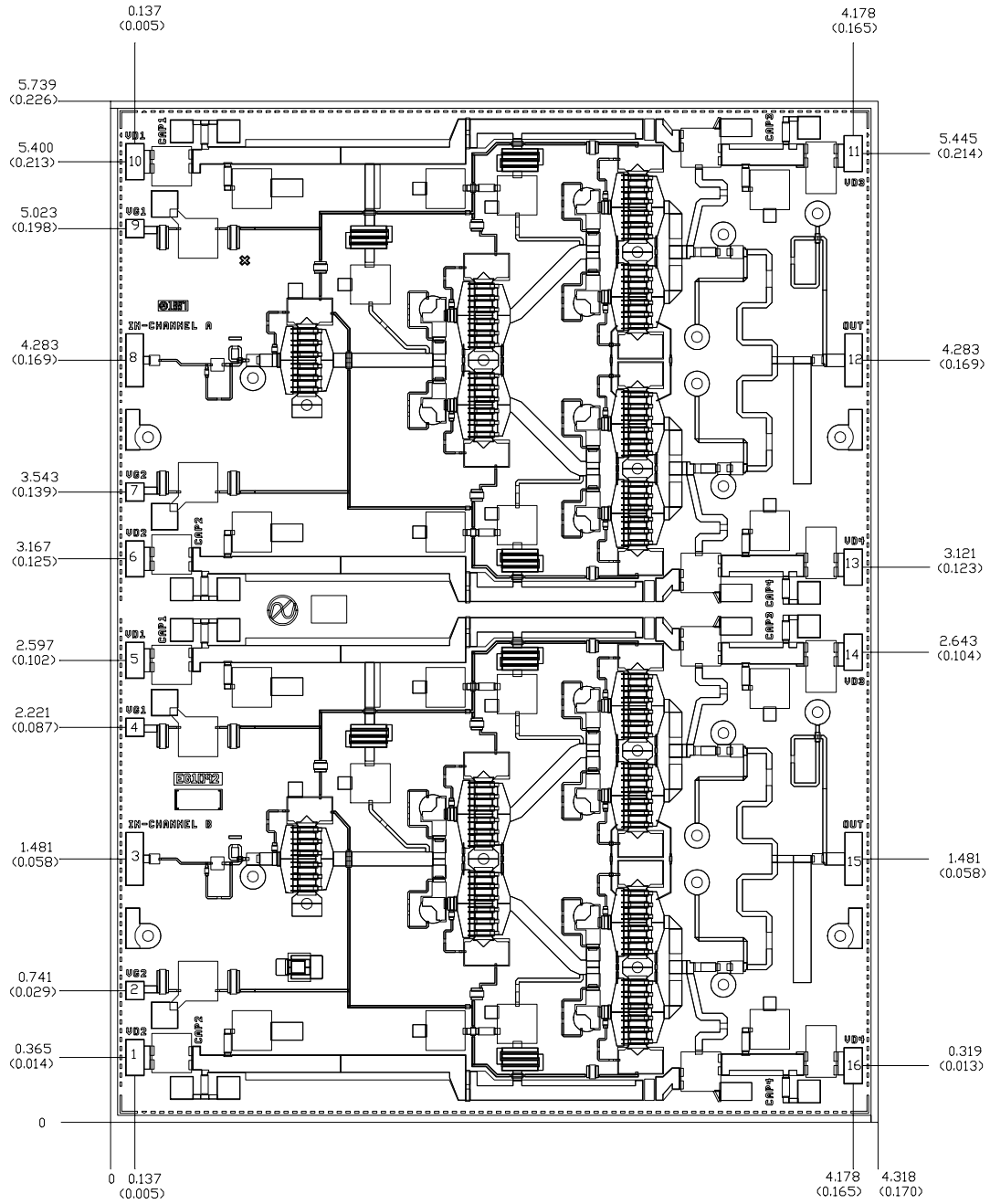
Mechanical Drawing



Units: millimeters (inches)
Thickness: 0.1016 (0.004) (reference only)
Chip edge to bond pad dimensions are shown to center of Bond pads.
Chip size tolerance: +/- 0.0508 (0.002)

Bond Pad #1,5,6,10 (Vd1&Vd2)	0.100 x 0.200	(0.004 x 0.008)
Bond Pad #11,13,14,16 (Vd3)	0.100 x 0.200	(0.004 x 0.008)
Bond Pad #2,4,7,9 (Vg)	0.100 x 0.100	(0.004 x 0.004)
Bond Pad #3,8 (RF Input)	0.100 x 0.300	(0.004 x 0.012)
Bond Pad #12,15 (RF Output)	0.100 x 0.300	(0.004 x 0.012)

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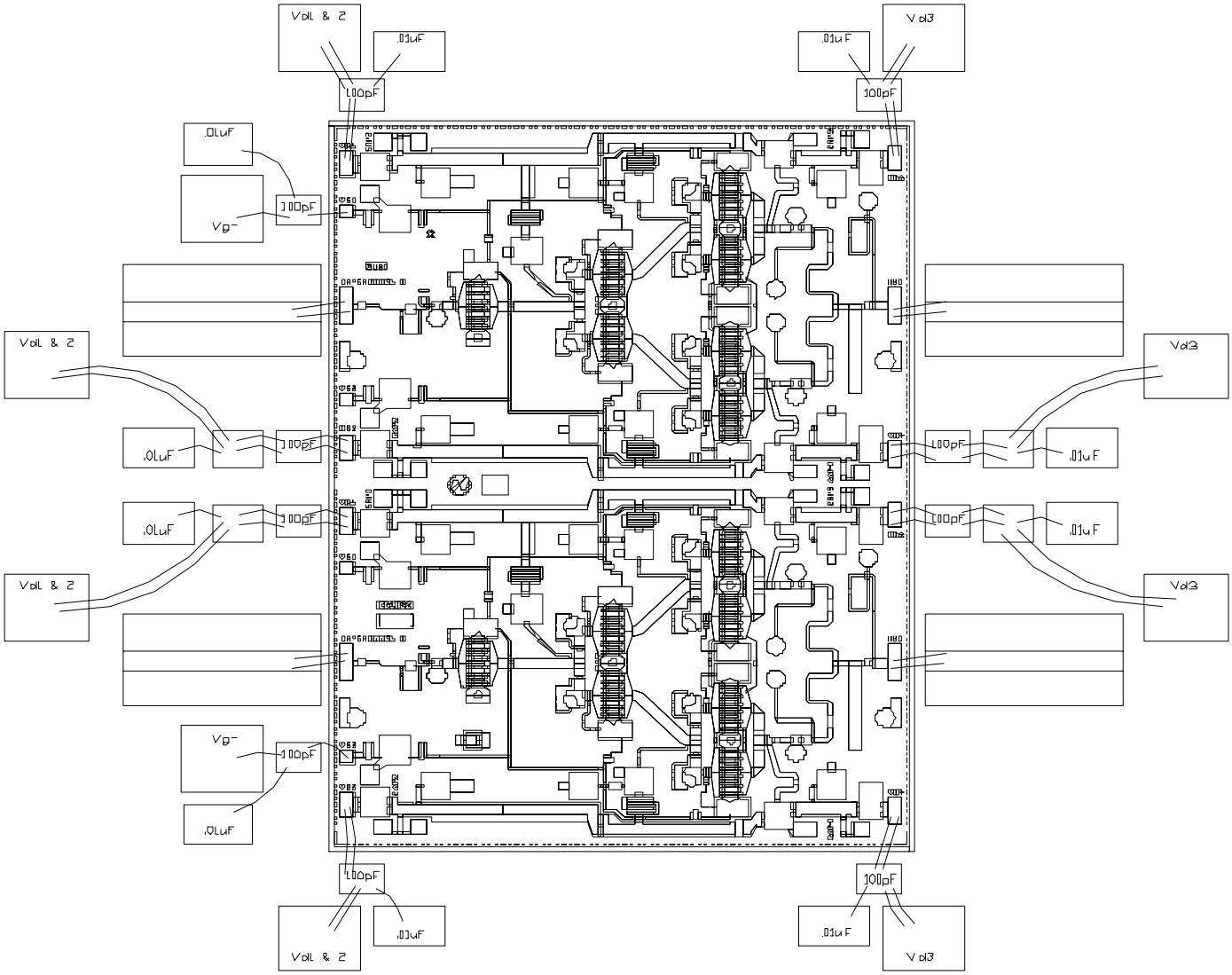
Chip Assembly and Bonding Diagram



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

Process and Assembly 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