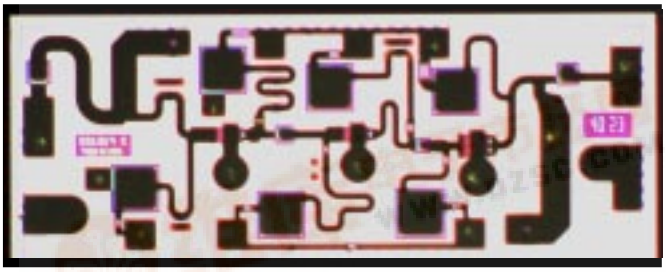
TriQuint SEMICONDUCTOR

Advance Product Information

November 6, 2001

Ka Band Wideband LNA/Driver

TGA1319C-EPU



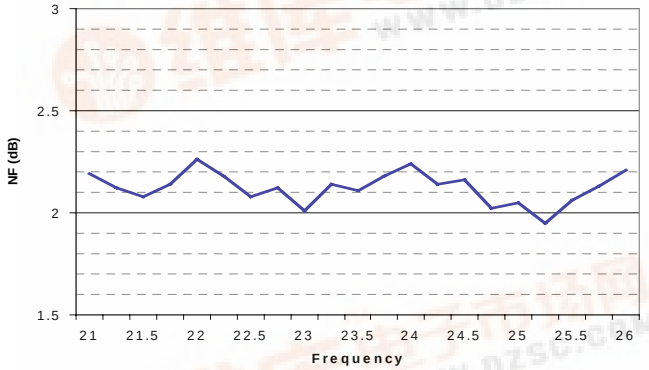
Chip Dimensions 2.179 mm x .847 mm

Key Features and Performance

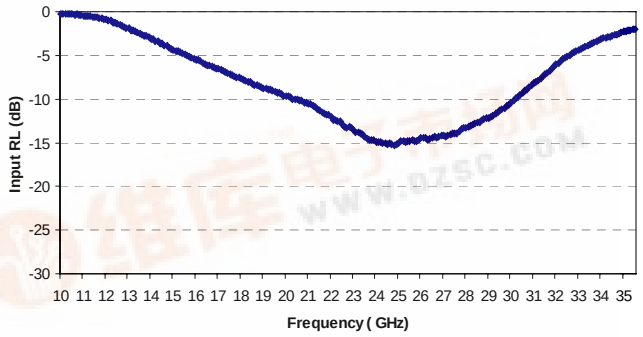
- 0.15um pHEMT Technology
- 16-30 GHz Frequency Range
- 2.25 dB Nominal Noise Figure midband
- 21 dB Nominal Gain
- 14 dBm Pout
- Bias 5V, 60 mA with -0.5V < Vg < +0.5V

Primary Applications

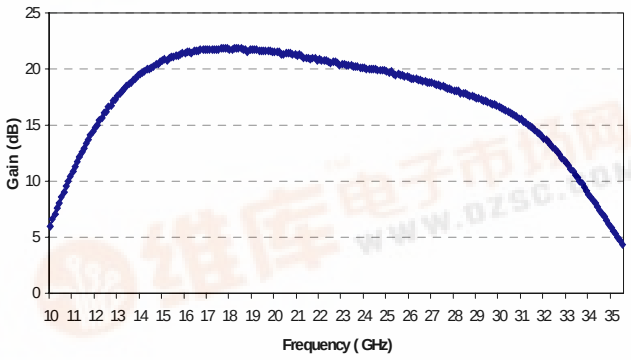
- Point-to-Point Radio
- Point-to-Multipoint Communications



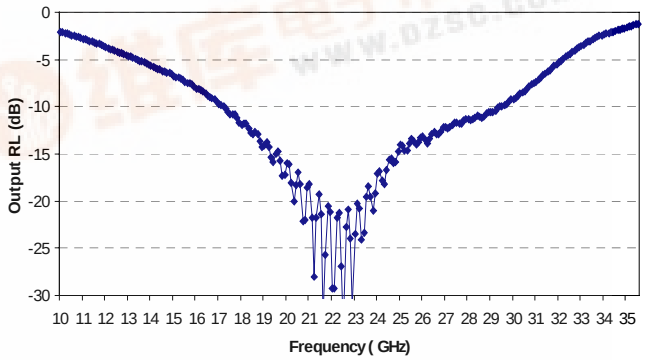
Typical NF @ 25C



Typical S11 @ 25C



Typical Gain @ 25C



Typical S22 @ 25C

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

MAXIMUM RATINGS

SYMBOL	PARAMETER 4/	VALUE	NOTES
V^+	POSITIVE SUPPLY VOLTAGE	9 V	
I^+	POSITIVE SUPPLY CURRENT	80 mA	1/
I^-	NEGATIVE GATE CURRENT	5.28 mA	
P_{IN}	INPUT CONTINUOUS WAVE POWER	18 dBm	
P_D	POWER DISSIPATION	.72 W	
T_{CH}	OPERATING CHANNEL TEMPERATURE	150 ^{0}C	2/ 3/
T_M	MOUNTING TEMPERATURE (30 SECONDS)	320 ^{0}C	
T_{STG}	STORAGE TEMPERATURE	-65 to 150 ^{0}C	

1/ Total current for all stages.

2/ These ratings apply to each individual FET.

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

4/ These ratings represent the maximum operable values for the device.

DC PROBE TESTS
(T_A = 25 °C ± 5°C)

Symbol	**Parameter**	**Minimum**	**Maximum**	**Value**
Idss	Saturated Drain Current	---	---	mA
V_P	Pinch-off Voltage	-1.5	-0.5	V
BVGS	Breakdown Voltage gate-source	---	---	V
BVGD	Breakdown Voltage gate-drain	---	---	V

ON-WAFER RF PROBE CHARACTERISTICS
(T_A = 25 °C ± 5°C)
V_d = 5 V, I_{d1} = 10 mA, I_{d2} = 50 mA

Symbol	**Parameter**	**Test Condition**	**Limit**			**Units**
			Min	**Typ**	**Max**	
Gain	Small Signal Gain	F = 21 – 27 GHz	19		---	dB
NF	Noise Figure	F = 21 – 25 GHz F = 26 – 26.5 GHz	--- ---		2.5 2	dB
PWR	Output Power @ P1dB	F = 21 – 26 GHz F = 27 GHz	10 9		--- ---	dBm

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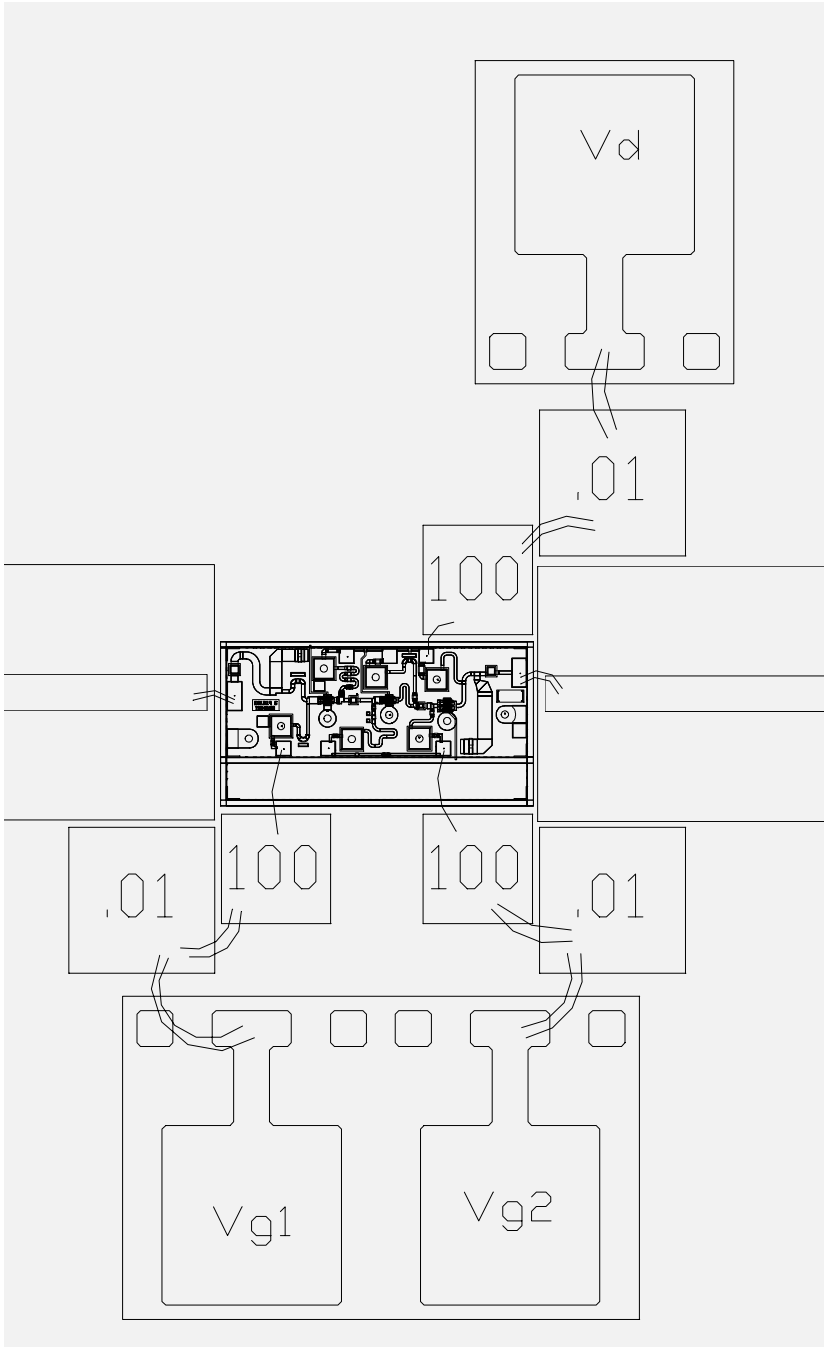
RFin



RFout

Notes:1. Vg1 and Vg2 may be sourced from the same supply.
2. Positive or negative gate bias may be required to achieve recommended operating point.

TGA1319C- Recommended Assembly Drawing

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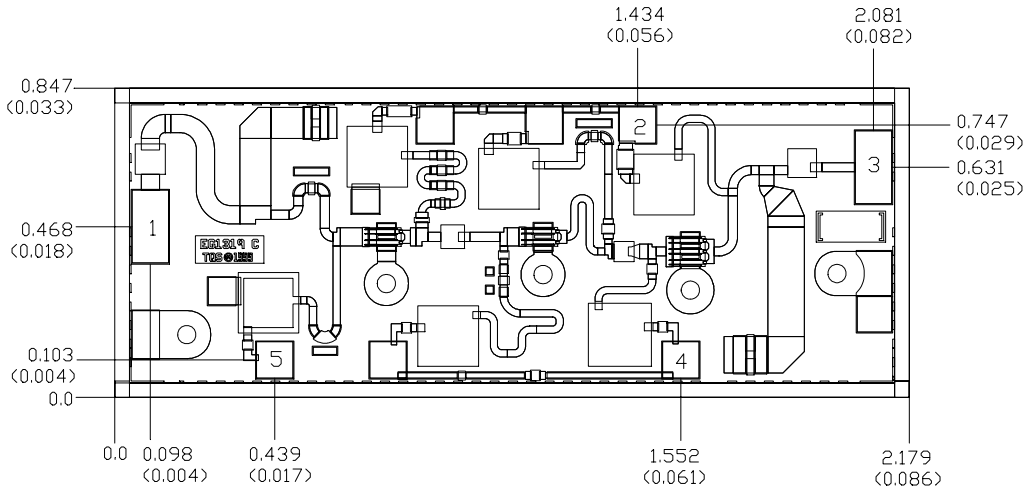

Units: millimeters (inches)
Thickness: 0.1016 (0.004)
Chip edge to bond pad dimensions are shown to center of bond pad
Chip size tolerance: +/- 0.051 (0.002)

Bond Pad #1 (RF Input)	0.100 x 0.200 (0.004 x 0.008)
Bond Pad #2 (Vd)	0.100 x 0.100 (0.004 x 0.004)
Bond Pad #3 (RF Output)	0.100 x 0.200 (0.004 x 0.008)
Bond Pad #4 (Vg2)	0.100 x 0.100 (0.004 x 0.004)
Bond Pad #5 (Vg1)	0.100 x 0.100 (0.004 x 0.004)

Mechanical Drawing

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Assembly Process Notes

Reflow process assembly notes:

- Use AuSn (80/20) solder with limited exposure to temperatures at or above 300°C.
- An alloy station or conveyor furnace with reducing atmosphere should be used.
- No fluxes should be utilized.
- Coefficient of thermal expansion matching is critical for long-term reliability.
- Devices must be stored in a dry nitrogen atmosphere.

Component placement and adhesive attachment assembly notes:

- Vacuum pencils and/or vacuum collets are the preferred method of pick up.
- Air bridges must be avoided during placement.
- The force impact is 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 is 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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