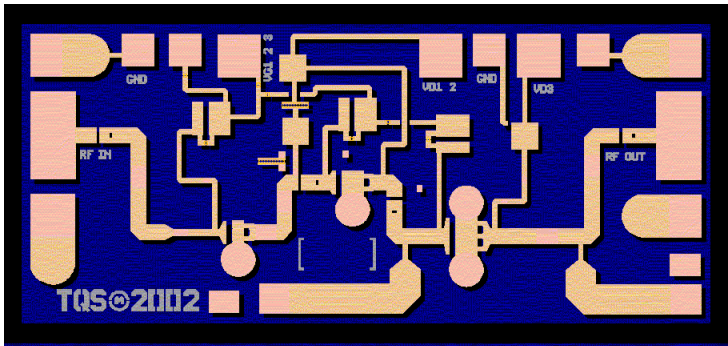


Ka Band Low Noise Amplifier



Key Features

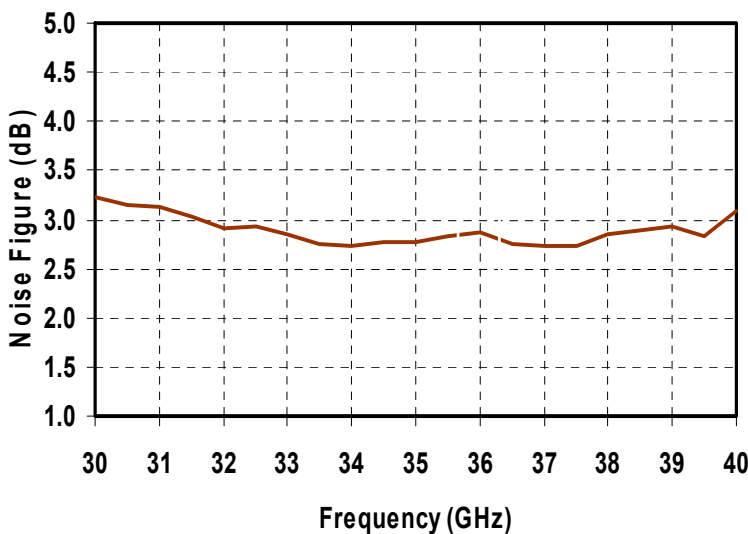
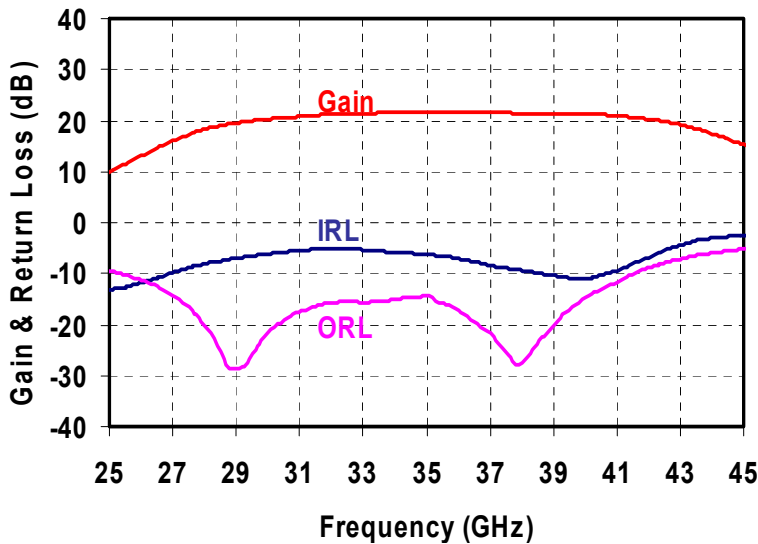
- Typical Frequency Range: 30 - 42 GHz
- 21 dB Nominal Gain
- 2.8 dB Nominal Noise Figure
- 2.8 dB Nominal Noise Figure
- 14 dBm Nominal P1dB @ 38 GHz
- Bias 3 V, 40mA
- 0.15 um 3MI pHEMT Technology
- Chip Dimensions 1.7 x 0.8 x 0.1 mm (0.067 x 0.031 x 0.004) in

Preliminary Measured Data

Bias Conditions: $V_d = 3\text{ V}$, $I_d = 40\text{ mA}$

Primary Applications

- Point-to-Point Radio
- Point-to-MultiPoint Radio
- Ka Band VSAT



Datasheet subject to change without notice

TABLE I
MAXIMUM RATINGS 1/

SYMBOL	PARAMETER	VALUE	NOTES
V*	Positive Supply Voltage	5 V	<u>2/</u>
Vg1	Gate 1 Supply Voltage Range	-1 V TO 0 V	
I*	Positive Supply Current	190 mA	<u>2/</u>
I _G	Gate Supply Current	6 mA	
P _{IN}	Input Continuous Wave Power	12 dBm	<u>2/</u>
P _D	Power Dissipation	0.95 W	<u>2/</u> , <u>3/</u>
T _{CH}	Operating Channel Temperature	200 °C	<u>4/</u> , <u>5/</u>
	Mounting Temperature (30 Seconds)	320 °C	
T _{STG}	Storage Temperature	-65 to 150 °C	

- 1/ These ratings represent the maximum operable values for this device.
- 2/ Current is defined under no RF drive conditions. Combinations of supply voltage, supply current, input power, and output power shall not exceed P_D.
- 3/ When operated at this power dissipation with a base plate temperature of 70 °C, the median life is 3.0E3 hours.
- 4/ 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.
- 5/ These ratings apply to each individual FET.

TABLE II
DC PROBE TESTS
 (T_a = 25 °C, Nominal)

SYMBOL	PARAMETER	MINIMUM	MAXIMUM	UNITS
V _{BVGS3}	Breakdown Voltage gate-source	-30	-5	V
V _{BVGD3}	Breakdown Voltage gate-drain	-30	-5	V
V _{P1,2,3}	Pinch-off Voltage	-1.0	-0.1	V

Q1 is 100 um FET, Q2 is 200 um FET, Q3 is 300 um FET

TABLE III
ELECTRICAL CHARACTERISTICS
 (Ta = 25 °C, Nominal)

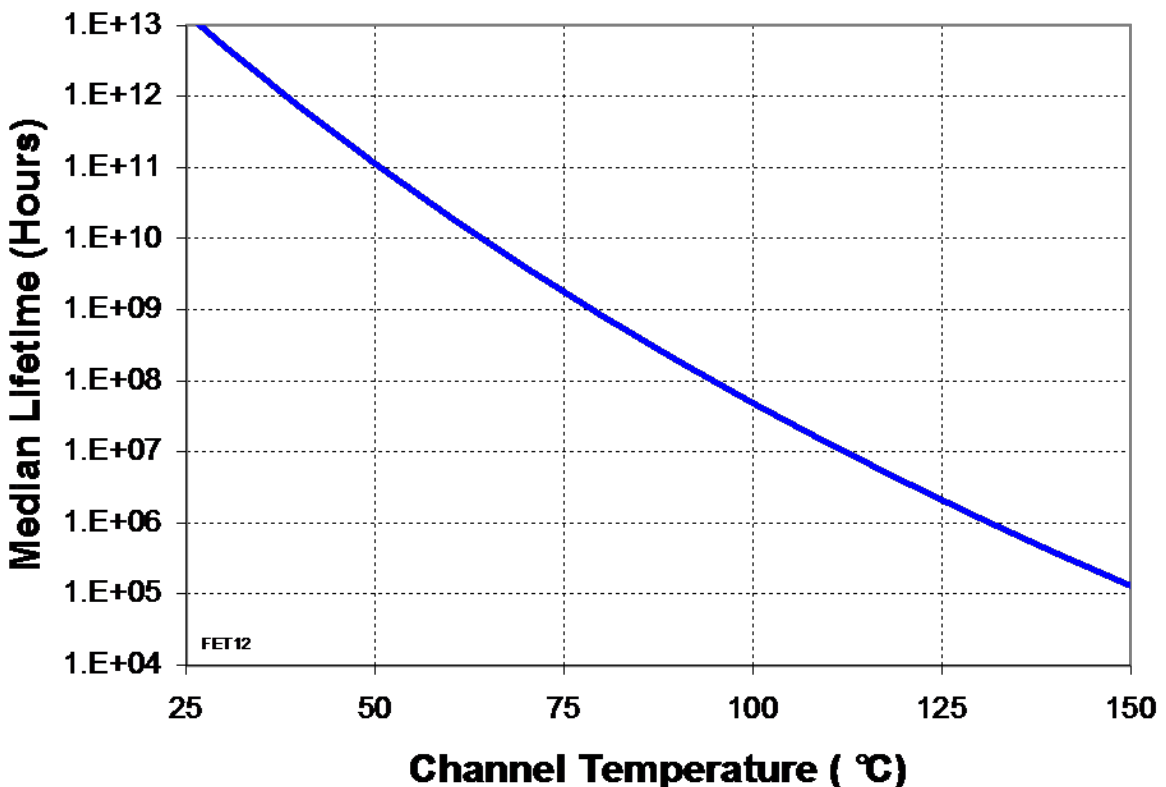
PARAMETER	TYPICAL	UNITS
Drain Voltage, Vd	3	V
Drain Current, Id	40	mA
Gate Voltage, Vg	-0.5 to 0	V
Small Signal Gain, S21	21	dB
Input Return Loss, S11	8	dB
Output Return Loss, S22	15	dB
Noise Figure, NF	2.8	dB
Output Power @ 1 dB Compression Gain @ 38 GHz, P1dB	14	dBm

TABLE IV
THERMAL INFORMATION

PARAMETER	TEST CONDITIONS	T _{CH} (°C)	θ _{JC} (°C/W)	T _m (HRS)
θ _{JC} Thermal Resistance (channel to backside of carrier)	V _d = 3 V I _D = 40 mA P _{diss} = 0.12 W	85	125	3E+7

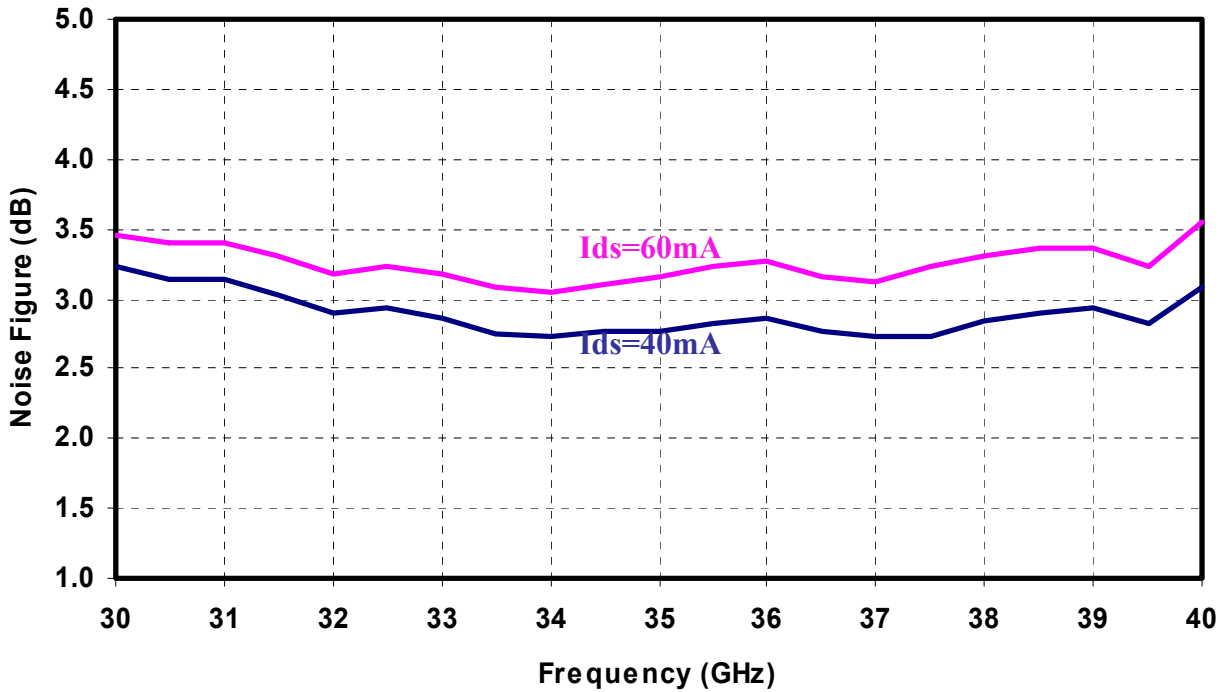
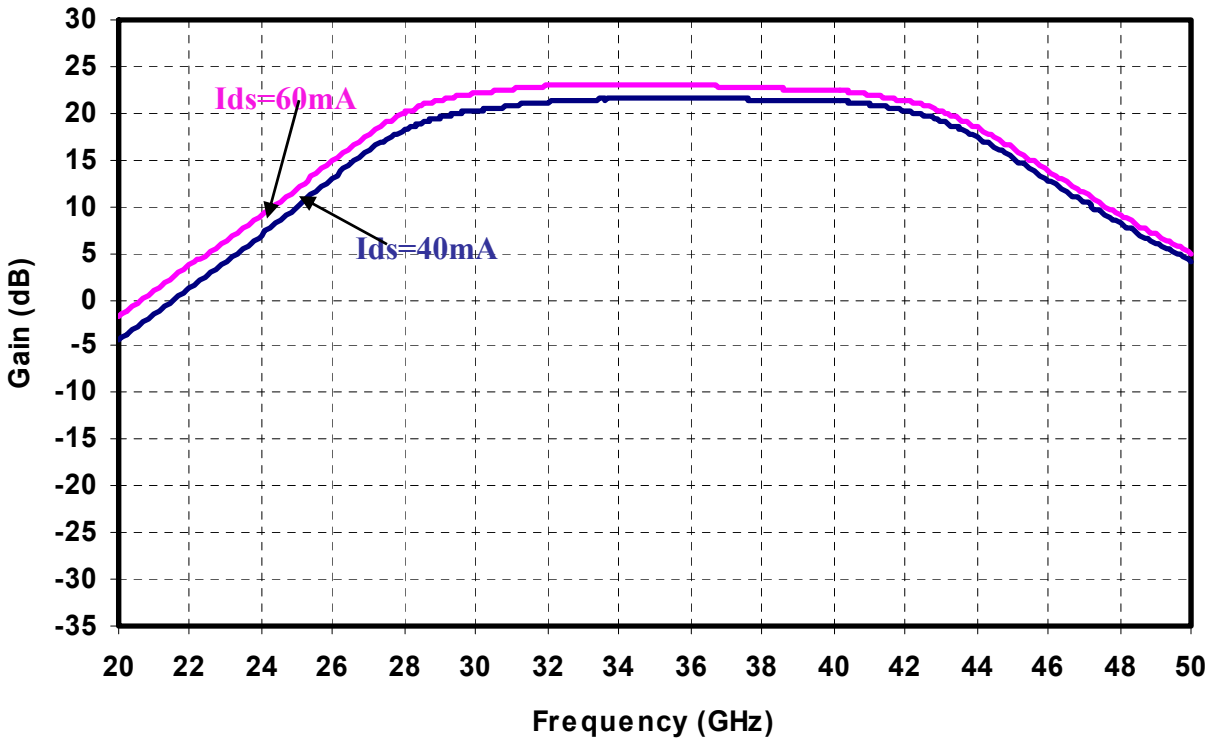
Note: Assumes eutectic attach using 1.5 mil 80/20 AuSn mounted to a 20 mil CuMo Carrier at 70°C baseplate temperature. Worst case condition with no RF applied, 100% of DC power is dissipated.

Median Lifetime (T_m) vs. Channel Temperature



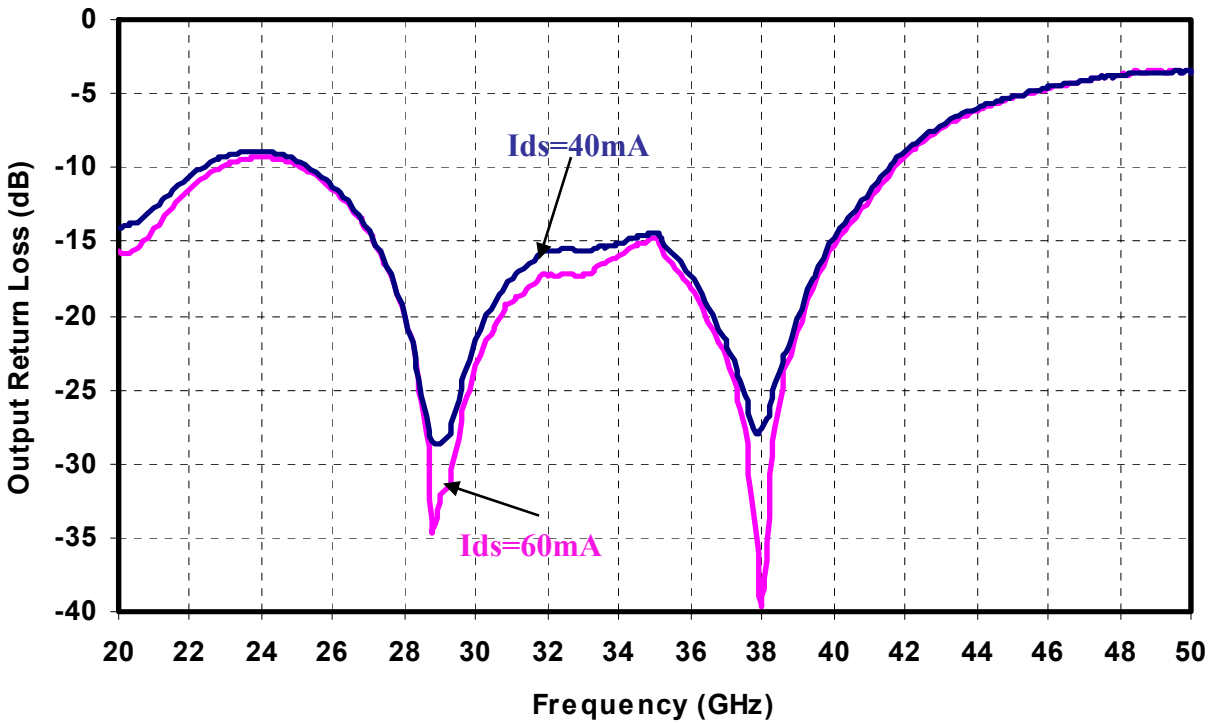
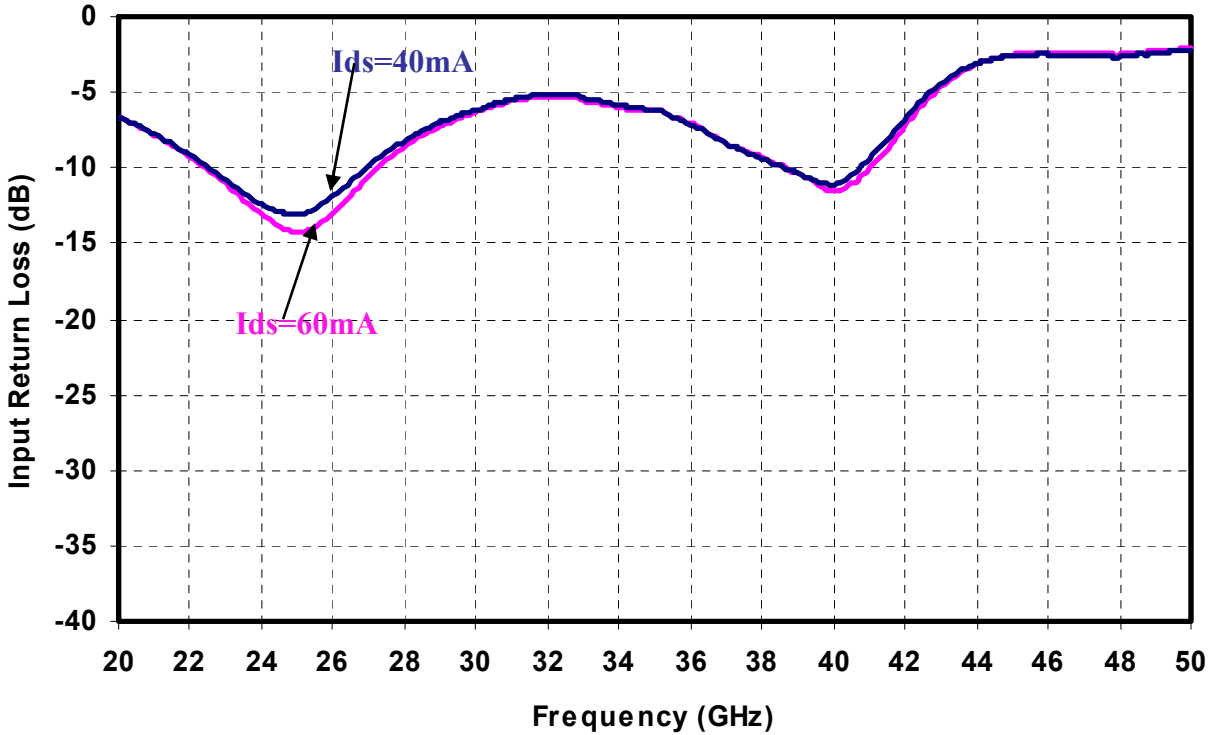
Measured Data

Bias Conditions: $V_d = 3\text{ V}$, $I_d = 40\text{mA}/60\text{mA}$

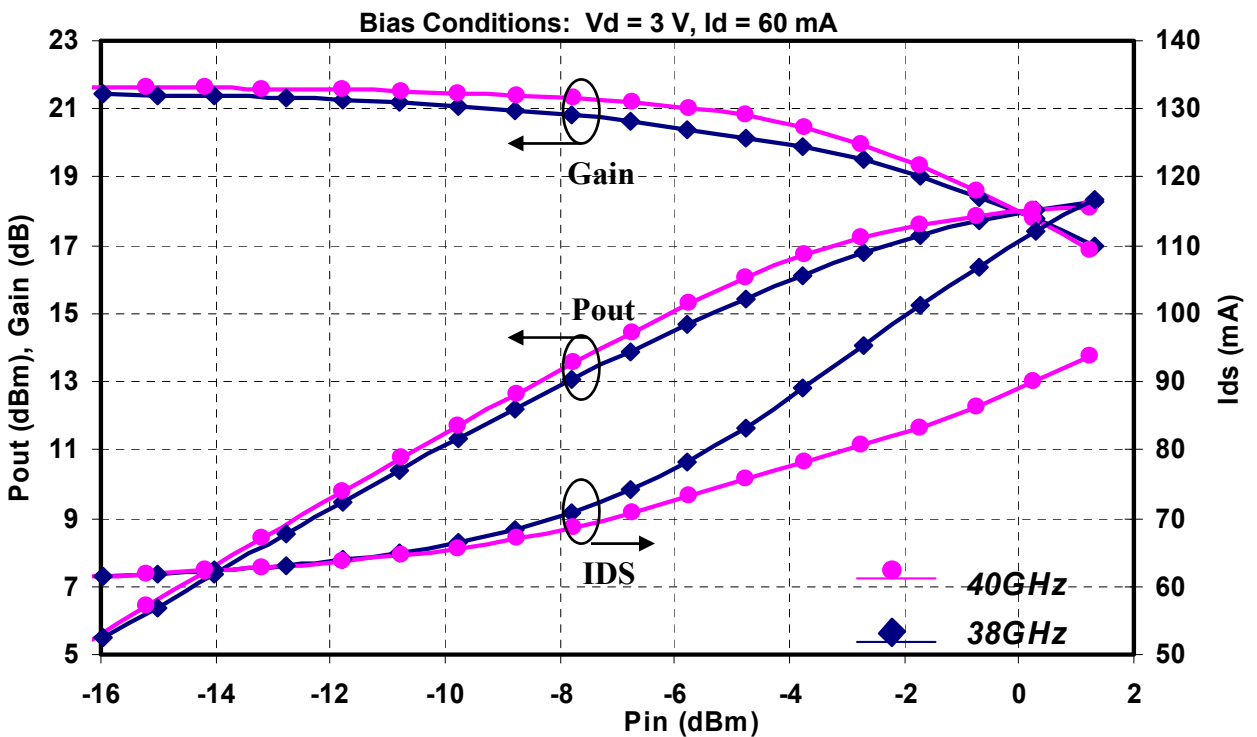
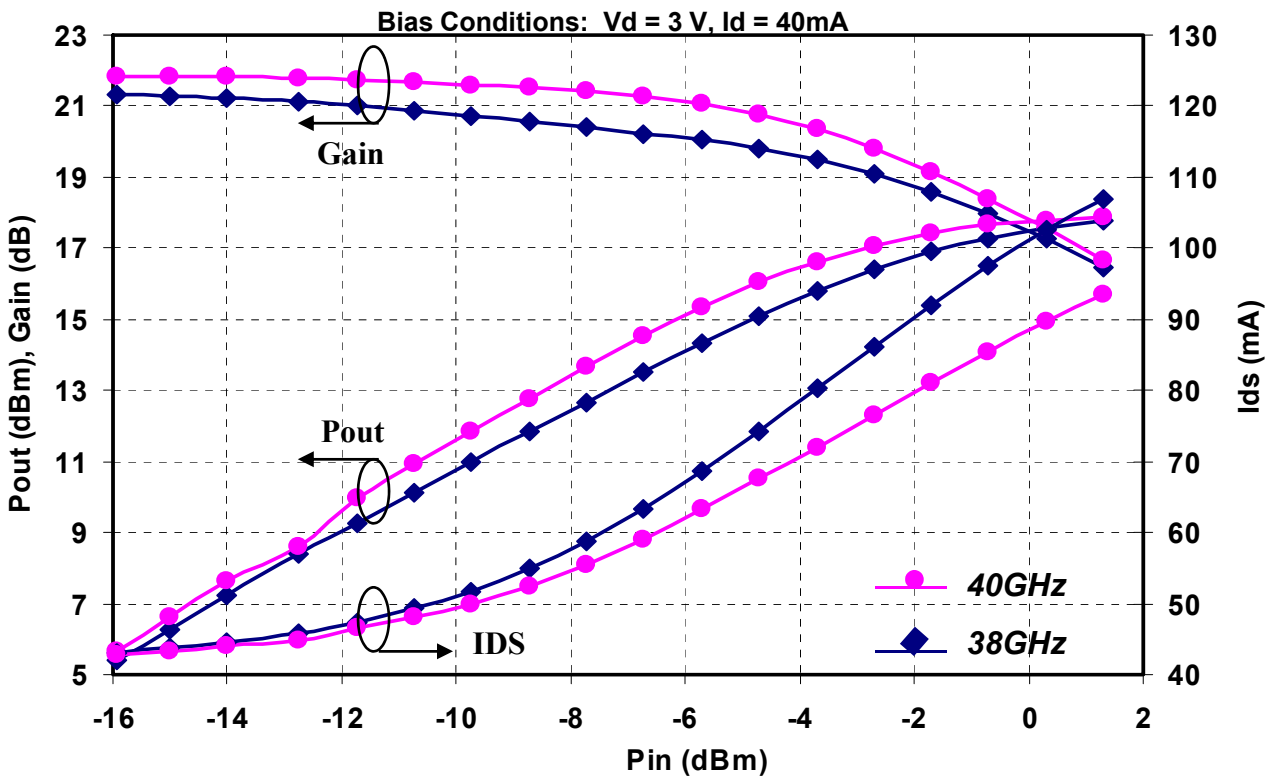


Measured Data

Bias Conditions: $V_d = 3\text{ V}$, $I_d = 40\text{ mA}/60\text{ mA}$

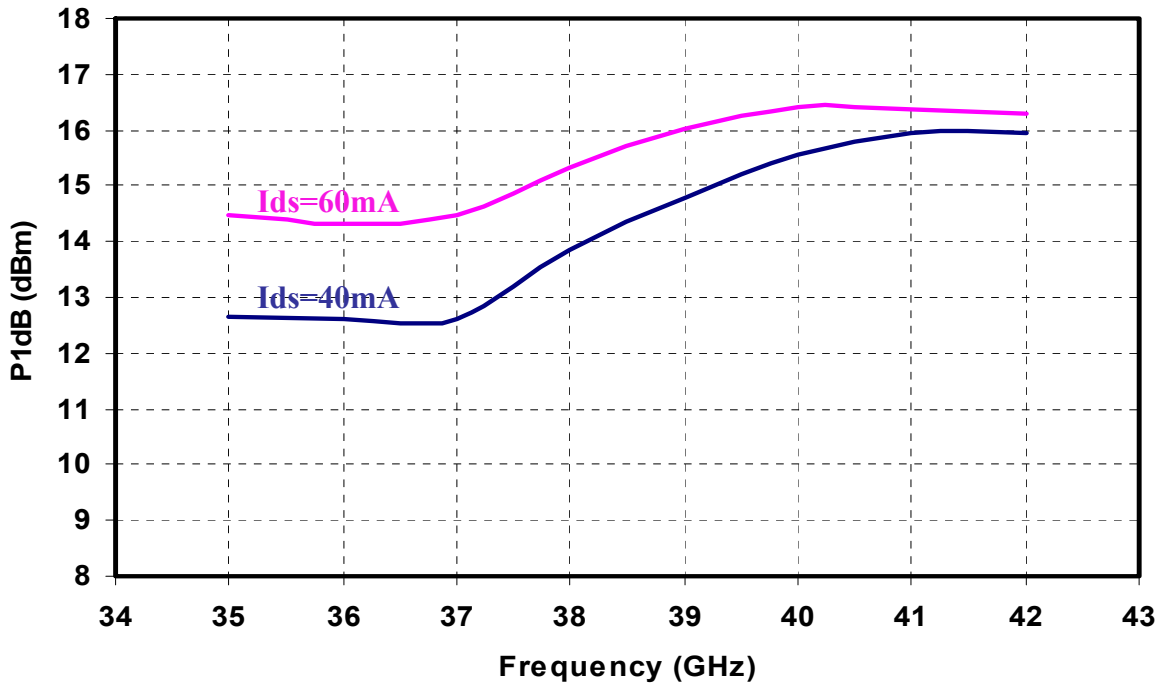


Measured Data

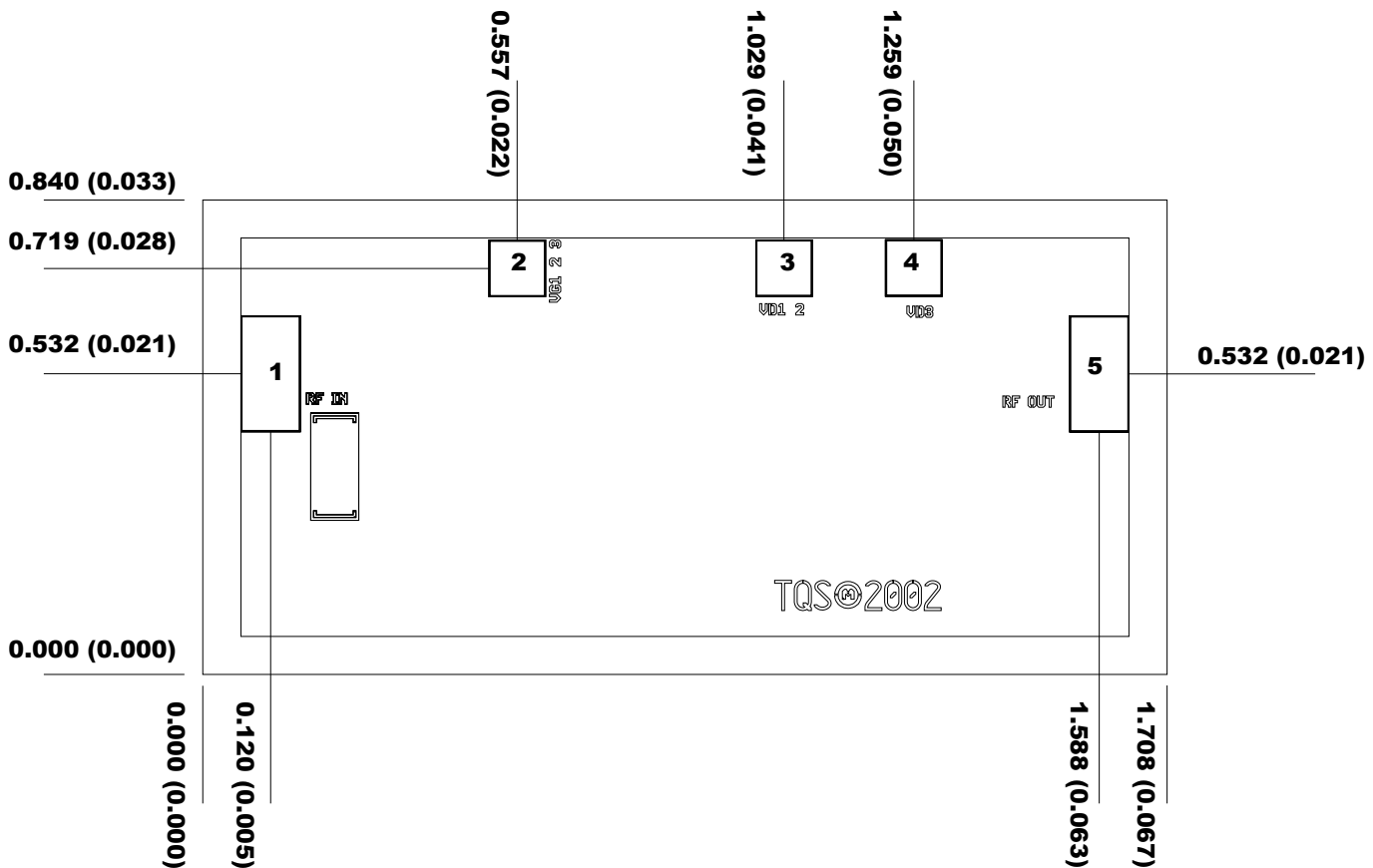


Measured Data

Bias Conditions: $V_d = 3\text{ V}$, $I_d = 40\text{mA}/60\text{mA}$



Mechanical Drawing



Units: Millimeters (Inches)

Thickness: 0.100 (0.004)

Chip edge to bond pad dimensions are shown to center of bond pad

Chip size tolerance: +/- 0.051 (0.002)

GND IS BACKSIDE OF MMIC

Bond pad #1 (RF In) 0.100 x 0.200 (0.004 x 0.008)

Bond pad #2 (Vg) 0.100 x 0.100 (0.004 x 0.004)

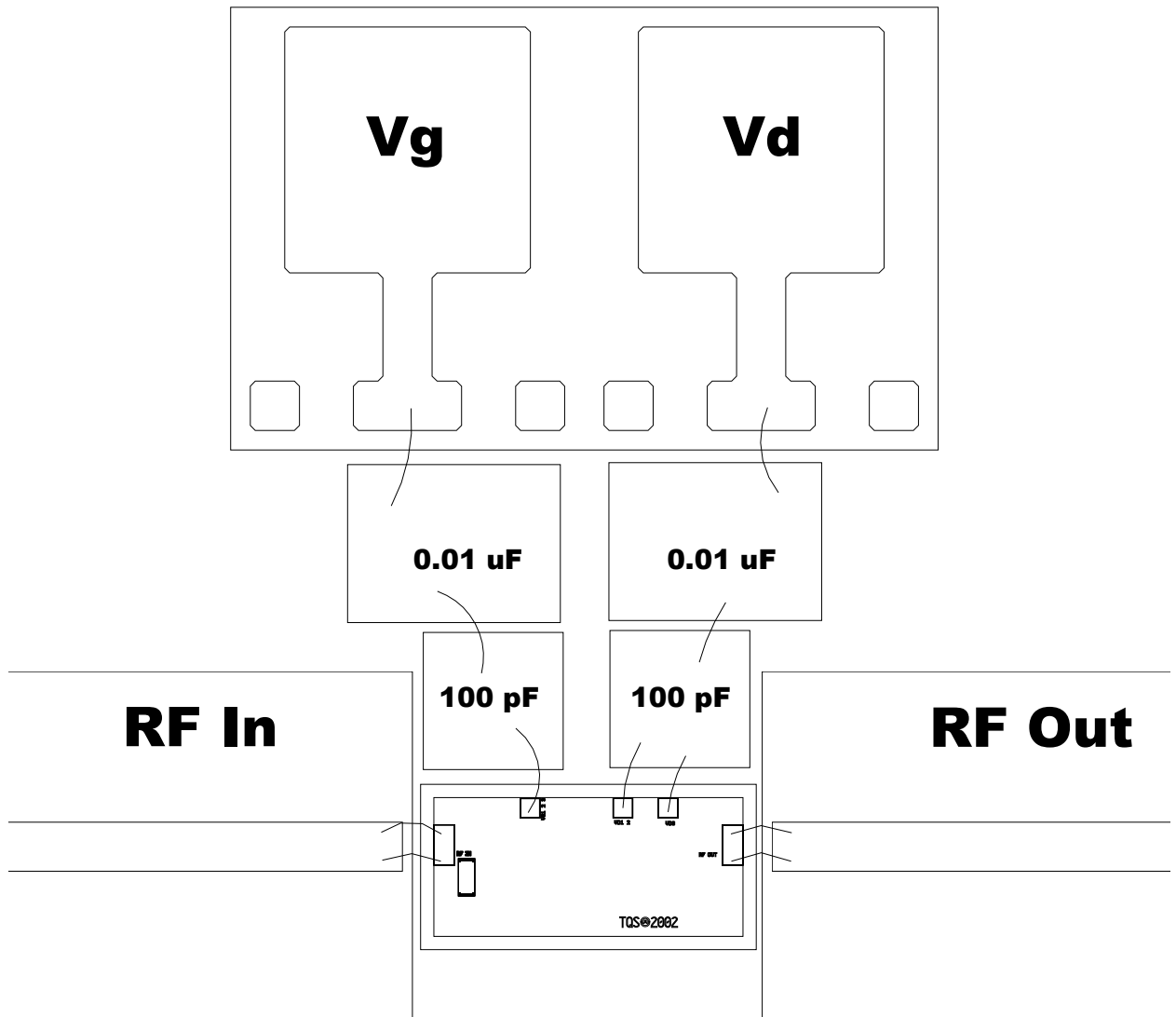
Bond pad #3 (Vd1,2) 0.100 x 0.100 (0.004 x 0.004)

Bond pad #4 (Vd3) 0.100 x 0.100 (0.004 x 0.004)

Bond pad #5 (RF Out) 0.100 x 0.200 (0.004 x 0.008)

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

Chip Assembly Diagram



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

Assembly Process Notes

Reflow process assembly notes:

- Use AuSn (80/20) solder with limited exposure to temperatures at or above 300 °C for 30 sec
- 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.
- 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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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