

Ka-Band Packaged MPA

TGA4902-SM



Key Features

- Typical Frequency Range: 25 - 35 GHz
- 25 dBm Nominal P1dB
- 18 dB Nominal Gain
- Bias 6 V, 220 mA
- Package Dimensions:
4.0 x 4.0 x 0.9 mm

Primary Applications

- Ka-Band VSAT
- Point-to-Point Radio
- Point-to-Multipoint Communications

Product Description

The TriQuint TGA4902-SM is a Ka-Band packaged medium Power Amplifier. The TGA4902-SM operates from 25-35 GHz and is designed using TriQuint's proven standard 0.25 um power pHEMT production process.

The TGA4902-SM typically provides 25 dBm of output power at 1 dB gain compression, with small signal gain of 18 dB.

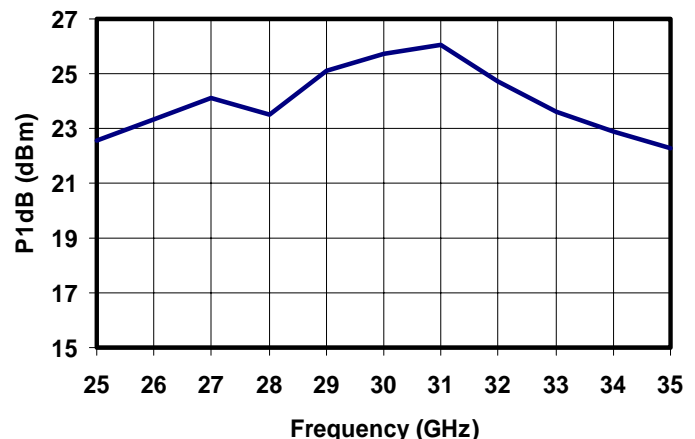
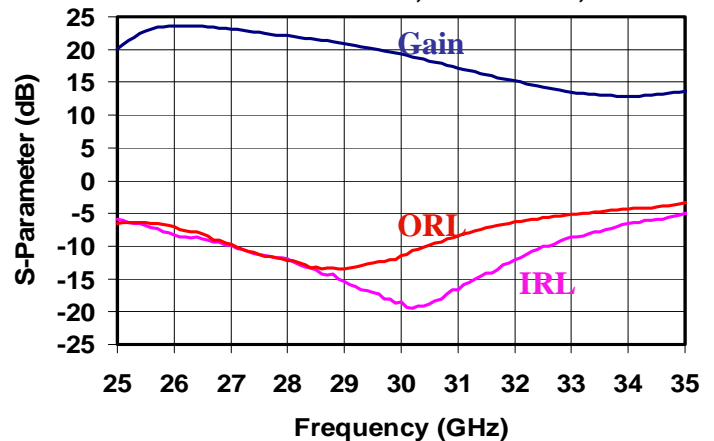
The TGA4902-SM is ideally suited for VSAT ground terminal market, Point-to-Point Radio, Point-to-Multipoint Communications.

Evaluation Boards are available.

Lead-free and RoHS compliant.

Preliminary Measured Data

Bias Conditions: $V_d = 6\text{ V}$, $I_d = 220\text{ mA}$, Tuned



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 _d	Drain Voltage	8 V	2/
V _g	Gate Voltage Range	-5 TO 0 V	
I _d	Drain Current	296 mA	2/ 3/
I _g	Gate Current	8.8 mA	3/
P _{IN}	Input Continuous Wave Power	20 dBm	
P _D	Power Dissipation	See note 4/	2/
T _{CH}	Operating Channel Temperature	150 °C	5/ 6/
T _M	Mounting Temperature (30 Seconds)	260 °C	
T _{STG}	Storage Temperature	-65 to 150 °C	
T _{CASE}	Package Operating Temperature	-40 to 110 °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_D.

3/ Total current for the entire MMIC.

4/ For a median life time of 1E+6 hrs, Power dissipation is limited to:

$$P_D(\text{max}) = (150\text{ }^{\circ}\text{C} - T_{\text{BASE}}\text{ }^{\circ}\text{C}) / 60.71\text{ }(^{\circ}\text{C}/\text{W})$$

Where T_{BASE} is the base plate temperature.

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

6/ These ratings apply to each individual FET.

TABLE II
ELECTRICAL CHARACTERISTICS

(Ta = 25 °C, Nominal)

PARAMETER	TYPICAL	UNITS
Frequency Range	25 - 35	GHz
Drain Operating	6	V
Quiescent Current	220	mA
Small Signal Gain	18	dB
Input Return Loss	15	dB
Output Return Loss	10	dB
Output Power @ 1 dB Compression Gain	25	dBm
Temperature Coefficient	-0.017	dB/°C

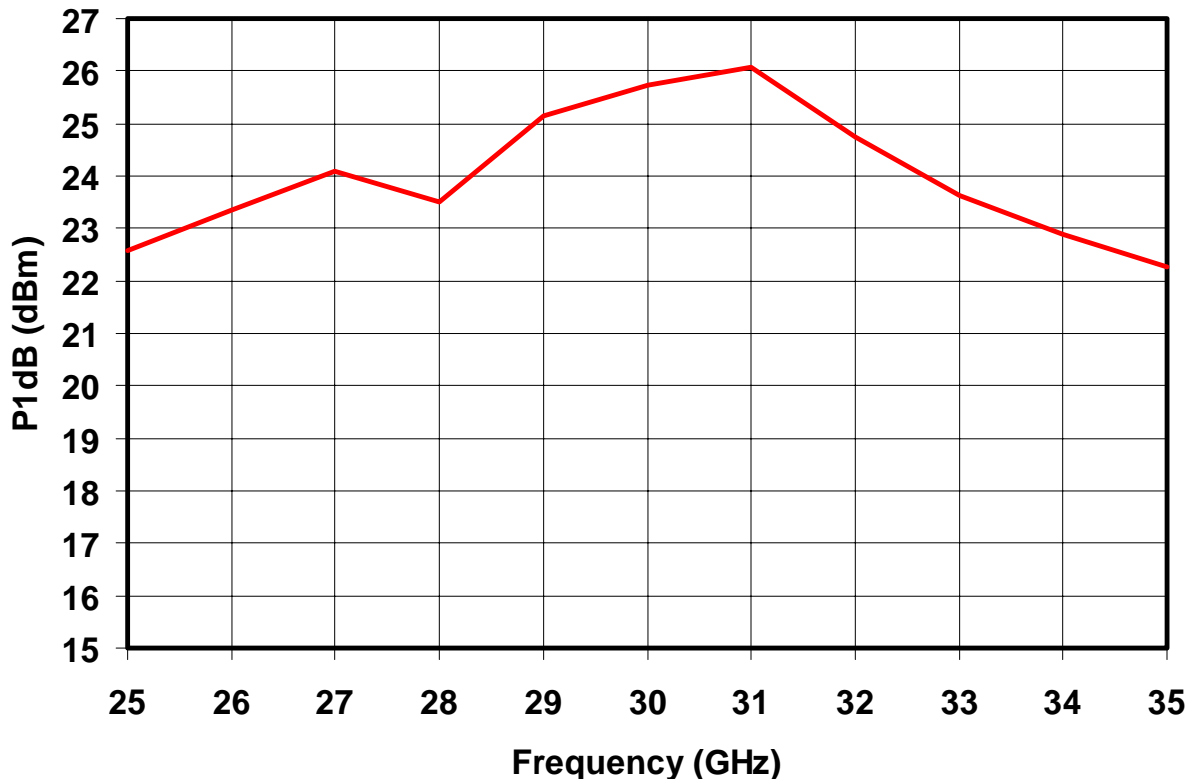
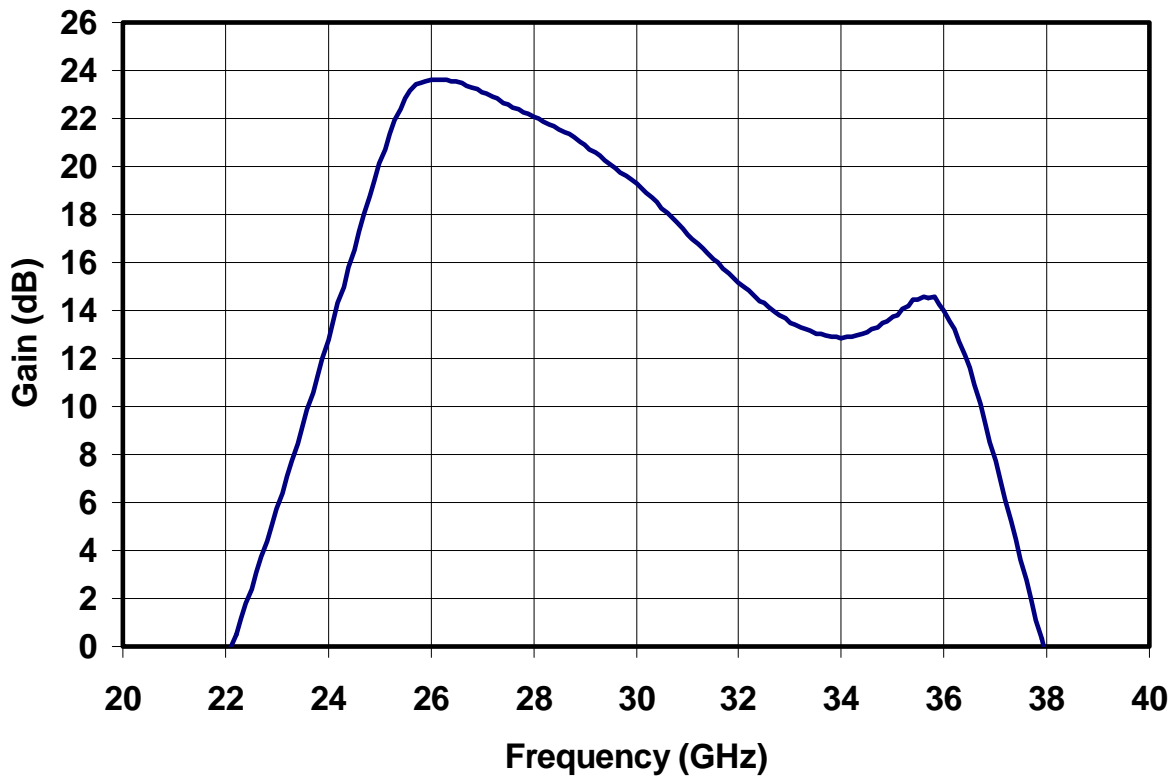
TABLE III
THERMAL INFORMATION

PARAMETER	TEST CONDITIONS	T _{CH} (°C)	R _{θJC} (°C/W)	T _M (HRS)
R _{θJC} Thermal Resistance (channel case)	Vd = 6 V I _D = 220 mA Pdiss = 1.32 W	150	60.71	1.0E+6

Note: Worst case condition with no RF applied, 100% of DC power is dissipated, Case Temperature @ 70 °C

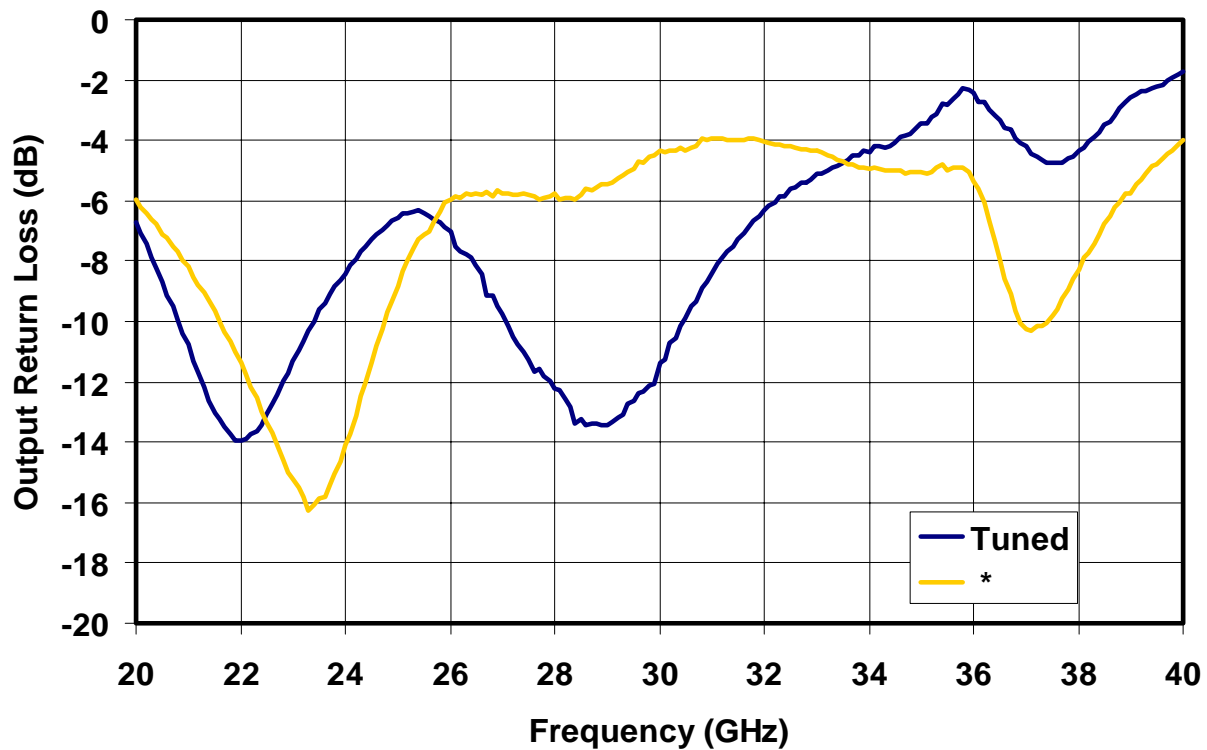
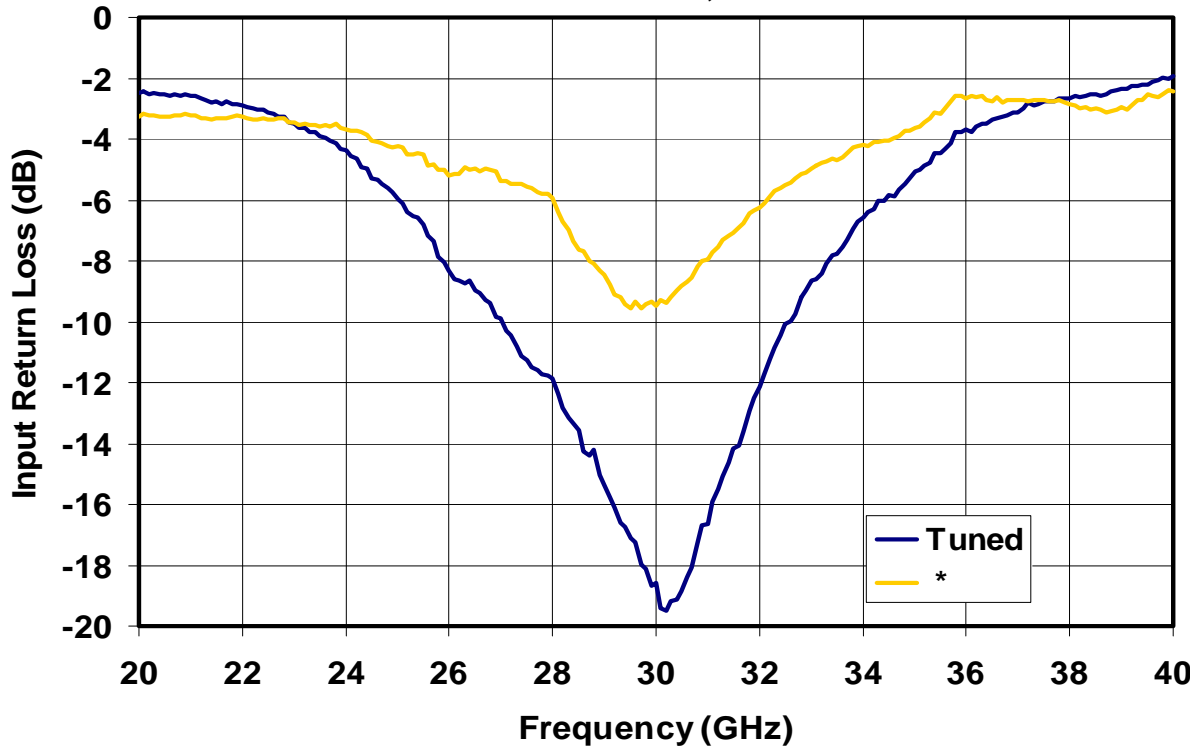
Preliminary Measured Data

Bias Conditions: $V_d = 6\text{ V}$, $I_d = 220\text{ mA}$, Tuned



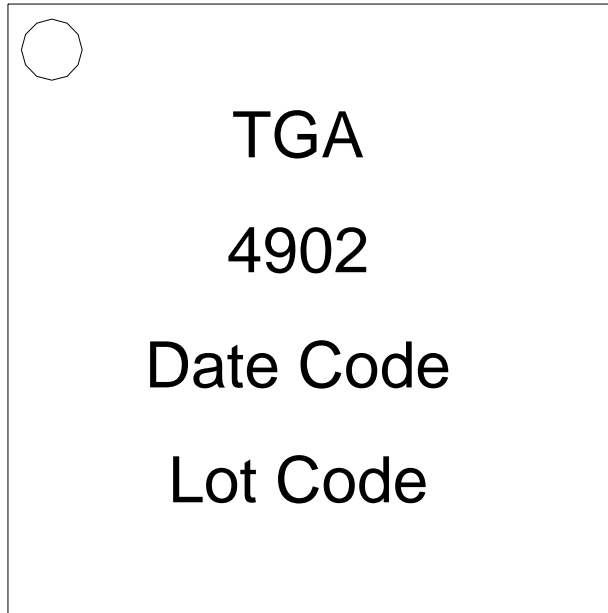
Preliminary Measured Data

Bias Conditions: $V_d = 6\text{ V}$, $I_d = 220\text{ mA}$



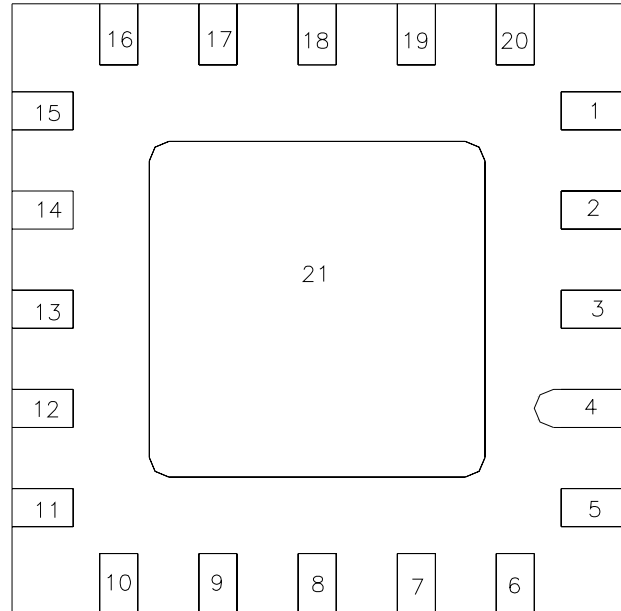
* As build performance without tuning stubs

Package Pinout Diagram



Top View

Dot indicates Pin 1

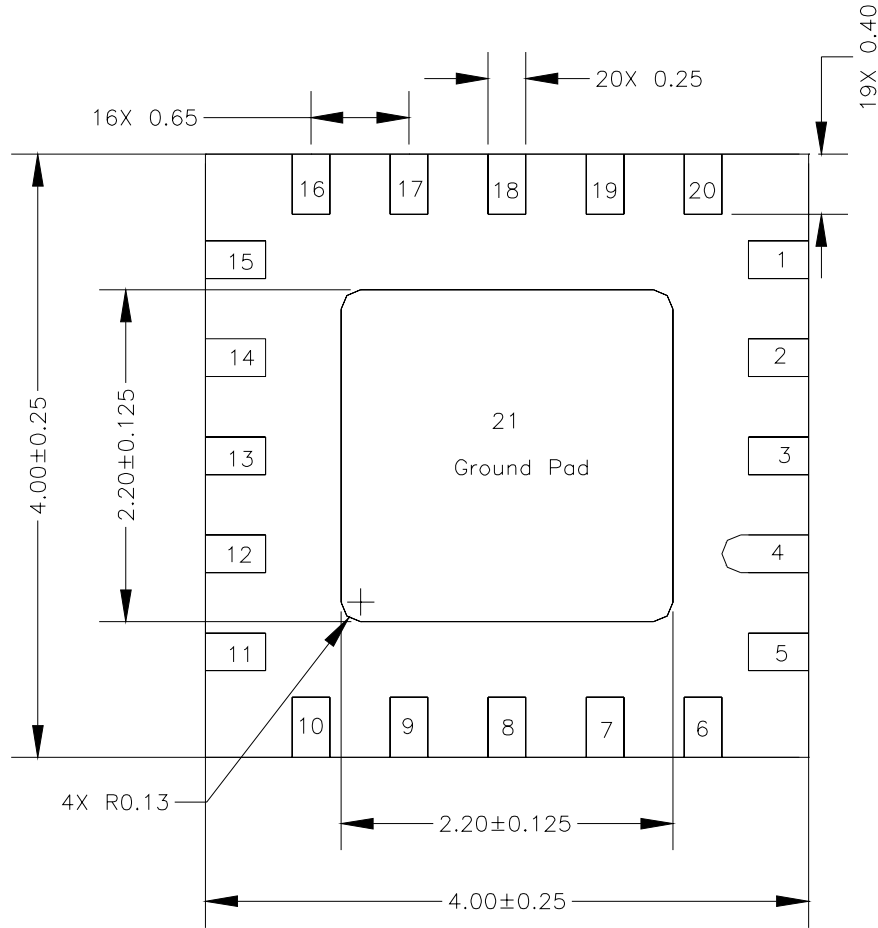


Bottom View

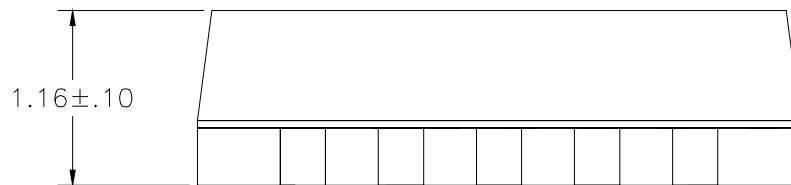
Pin	Description
1, 5, 6, 10, 11, 15, 16, 20, 21	GND
2, 4, 7, 12, 14, 19	NC
3	RF Input
8	Vg1
9	Vg2
13	RF Output
17	Vd1
18	Vd2

Mechanical Drawing

TGA4902-SM



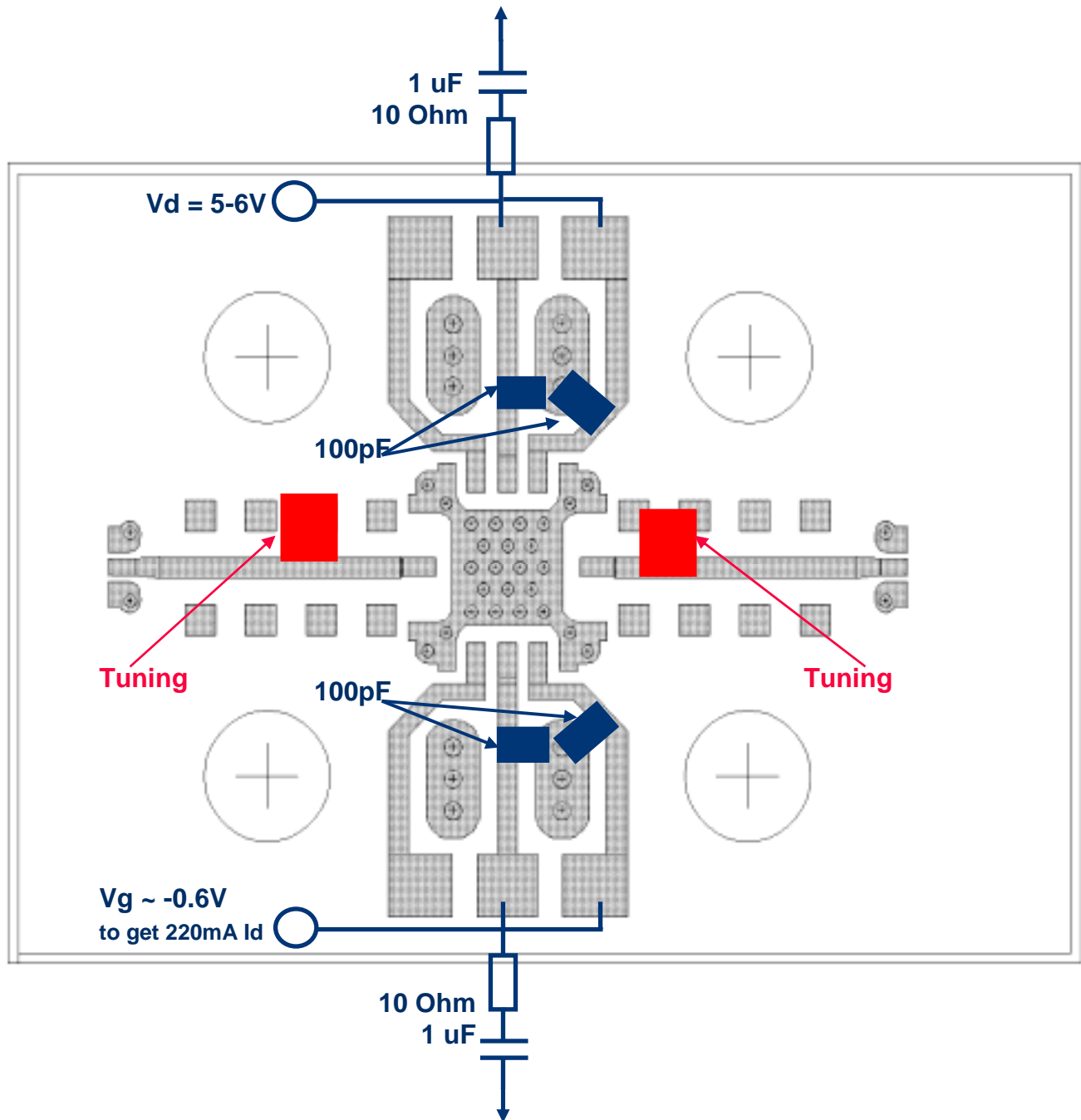
BOTTOM VIEW



SIDE VIEW

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

Recommended Board Layout Assembly



Recommended Surface Mount Package Assembly

Proper ESD precautions must be followed while handling packages.

Clean the board with acetone. Rinse with alcohol. Allow the circuit to fully dry.

TriQuint recommends using a conductive solder paste for attachment. Follow solder paste and reflow oven vendors' recommendations when developing a solder reflow profile. Typical solder reflow profiles are listed in the table below.

Hand soldering is not recommended. Solder paste can be applied using a stencil printer or dot placement. The volume of solder paste depends on PCB and component layout and should be well controlled to ensure consistent mechanical and electrical performance.

Clean the assembly with alcohol.

Typical Solder Reflow Profiles

Reflow Profile	SnPb	Pb Free
Ramp-up Rate	3 °C/sec	3 °C/sec
Activation Time and Temperature	60 – 120 sec @ 140 – 160 °C	60 – 180 sec @ 150 – 200 °C
Time above Melting Point	60 – 150 sec	60 – 150 sec
Max Peak Temperature	240 °C	260 °C
Time within 5 °C of Peak Temperature	10 – 20 sec	10 – 20 sec
Ramp-down Rate	4 – 6 °C/sec	4 – 6 °C/sec

Ordering Information

Part	Package Style
TGA4902-SM	QFN 4x4 Surface Mount