

## 13.75 - 14.5 GHz 1 W MMIC

### FEATURES

- $P_{1dB}$ : 30 dBm
- Small Signal Gain: 30dB
- Noise Figure: 7 dB
- IP3: 39 dBm
- Bias Condition: 750 mA @ 8V

### PHOTO ENLARGEMENT



### DESCRIPTION

The TC4531 is a four stage PHEMT power amplifier MMIC that is designed for use as an output stage or a driver in VSAT ODU. The amplifier provides a minimum of 29 dB gain and delivers 1 watt output power from 13.75 to 14.5 GHz. The small package provides a simple, cost effective solution to customized designs. The base material is gold plated copper-tungsten for excellent thermal dissipation.

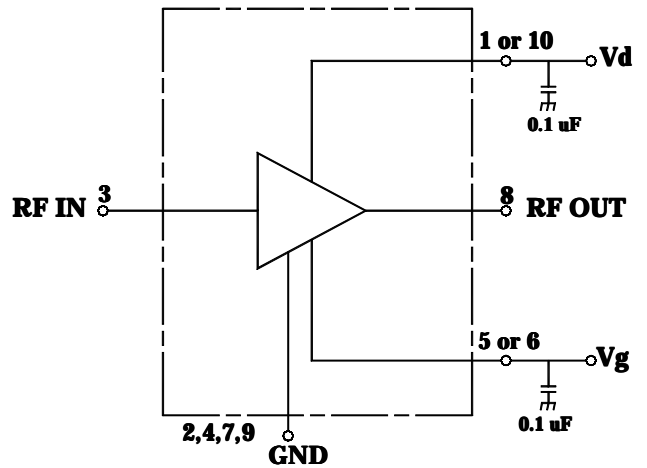
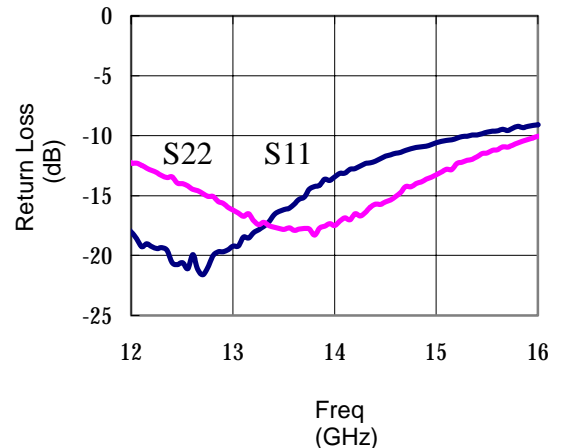
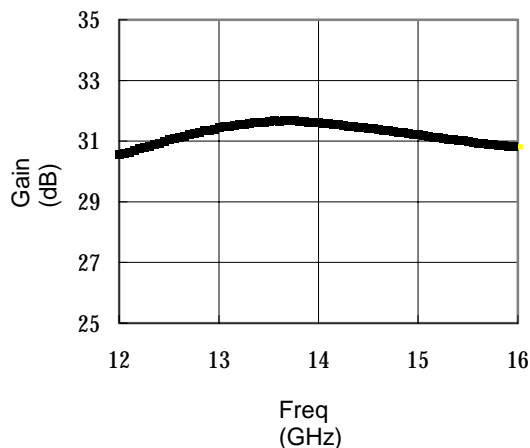
The MMIC is fabricated using Transcom's propriety matured GaAs PHEMT process. The process features full passivation for increased performance and reliability. It is 100% RF tested to ensure compliance to performance specifications.

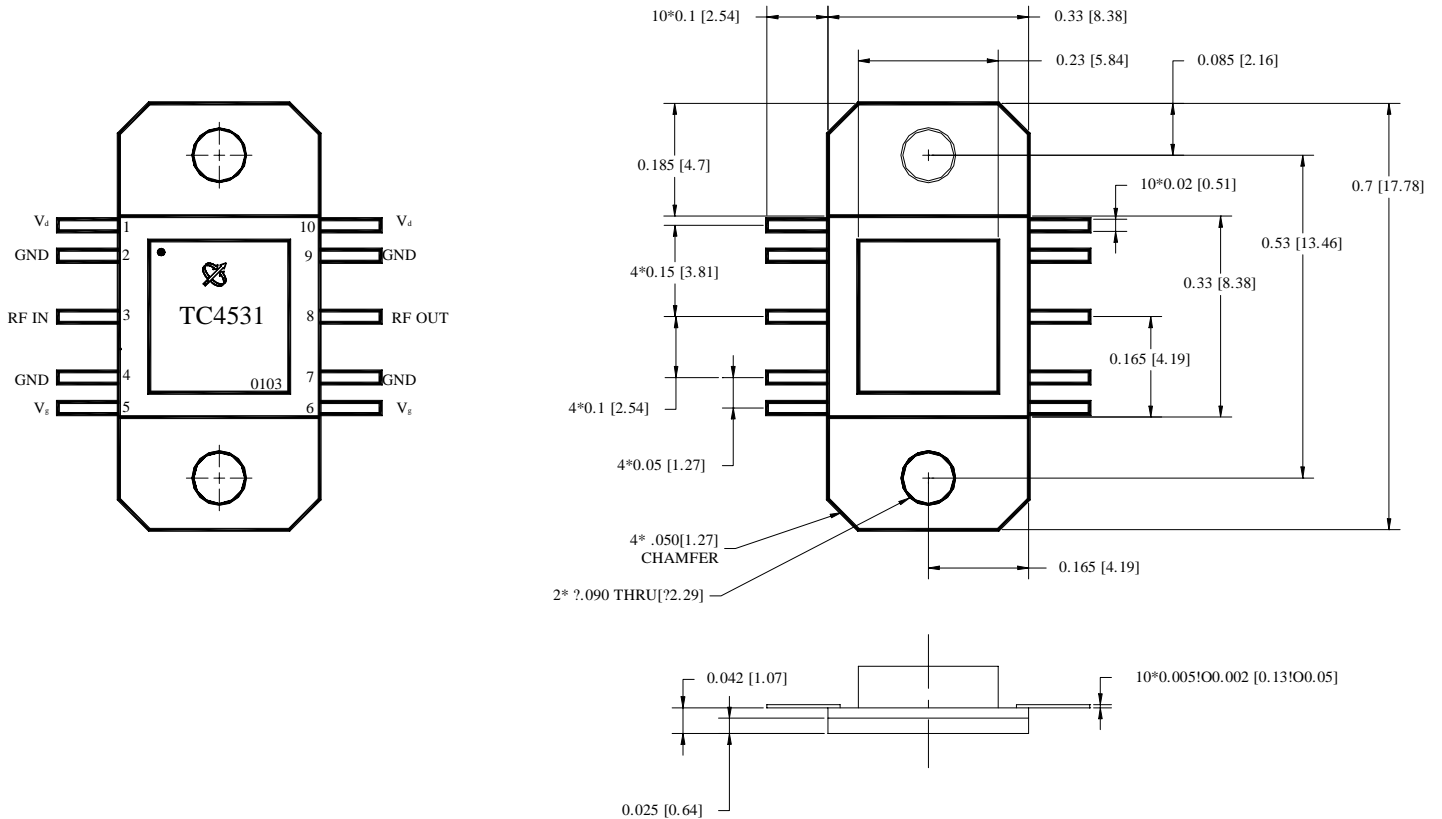
### ELECTRICAL SPECIFICATIONS ( $T_a = 25\text{ }^\circ\text{C}$ )

SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
<b>FREQ</b>	Frequency Range	13.75		14.5	GHz
<b>SSG</b>	Small Signal Gain	29	30		dB
<b>GOF</b>	Small Signal Gain Flatness		$\pm 1$	$\pm 1.5$	dB
<b>P1dB</b>	Output Power at 1 dB Gain Compression	29.5	30.5		dBm
<b>P3dB</b>	Output Power at 3 dB Gain Compression	30.5	31		dBm
<b>IP3</b>	Third Order Intercept Point	38	39		dBm
<b>VSWR, IN</b>	Input VSWR		2:1		
<b>VSWR, OUT</b>	Output VSWR		2.5:1		
<b>VDD</b>	Supply Voltage		8		Volt
<b>Vg</b>	Gate Voltage	-0.5	-1.0	-1.5	Volt
<b>IDD</b>	Current Supply Without RF		750		mA
<b>IDP<sub>1</sub></b>	Current Supply @ Pout = P <sub>1dB</sub>		750		mA
<b>NF</b>	Noise Figure		7	9	dB
<b><math>\eta_a</math></b>	Power Added Efficiency		15		%

**ABSOLUTE MAXIMUM RATINGS at 25 °C**

Symbol	Parameter	Rating
$V_{DS}$	Drain-Source Voltage	10 V
$V_{GS}$	Gate-Source Voltage	-5 V
$I_D$	Drain Current	1600 mA
$P_T$	Continuous Dissipation	12 W
$P_{in}$	Input Power, CW	10 dBm
$T_{CH}$	Channel Temperature	175 °C
$T_{STG}$	Storage Temperature	- 65 °C to +175 °C

**TYPICAL BIAS CONFIGURATION**

**TYPICAL PERFORMANCE**


**DIMENSION DRAWING [in inch (mm)]**


Pin No.	Pin Name	Description
1, 10	VDD	Drain Supply
2, 4, 7, 9	GND	Ground
3	RF IN	RF Input
8	RF OUT	RF Output
5, 6	VGG	Gate Supply