

## 1W Low-Cost Packaged PHEMT GaAs Power FETs

### FEATURES

- 1W Typical Output Power at 6 GHz
- 11dB Typical Power Gain at 6 GHz
- High Linearity:
  - IP3 = 40 dBm Typical at 6 GHz
- High Power Added Efficiency:
  - PAE ≥ 43 % for Class A Operation
- Suitable for High Reliability Application
- Breakdown Voltage:
  - BV<sub>DGO</sub> ≥ 15 V
- L<sub>g</sub> = 0.35 μm, W<sub>g</sub> = 2.4 mm
- 100 % DC Tested
- Low Cost Ceramic Package

### PHOTO ENLARGEMENT



### DESCRIPTION

The TC2571 is packaged the TC1501 Pseudomorphic High Electron Mobility Transistor (PHEMT) GaAs Power chip. The cu-based ceramic package that requires a surface-mount package is a low-cost and high performance package. All devices are 100% DC tested to assure consistent quality. Typical applications include high dynamic range power amplifier for commercial applications including Cellular/PCS systems, and military high performance power amplifier.

### ELECTRICAL SPECIFICATIONS (T<sub>A</sub>=25°C)

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
P <sub>1dB</sub>	Output Power at 1dB Gain Compression Point, $f = 6\text{GHz}$ V <sub>DS</sub> = 8 V, I <sub>DS</sub> = 300 mA	29.5	30		dBm
G <sub>1dB</sub>	Power Gain at 1dB Gain Compression, $f = 6\text{GHz}$ V <sub>DS</sub> = 8 V, I <sub>DS</sub> = 300 mA		11		dB
IP3	Intercept Point of the 3 <sup>rd</sup> -order Intermodulation, $f = 6\text{GHz}$ V <sub>DS</sub> = 8 V, I <sub>DS</sub> = 300 mA, *P <sub>SCL</sub> = 17 dBm		40		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 6\text{GHz}$		43		dB
I <sub>DSS</sub>	Saturated Drain-Source Current at V <sub>DS</sub> = 2 V, V <sub>GS</sub> = 0 V		600		mA
g <sub>m</sub>	Transconductance at V <sub>DS</sub> = 2 V, V <sub>GS</sub> = 0 V		400		mS
V <sub>p</sub>	Pinch-off Voltage at V <sub>DS</sub> = 2 V, I <sub>D</sub> = 4.8 mA		-1.7**		Volts
BV <sub>DGO</sub>	Drain-Gate Breakdown Voltage at I <sub>DGO</sub> = 1.2 mA	15	18		Volts
R <sub>th</sub>	Thermal Resistance		16		°C/W

\* P<sub>SCL</sub> : Output Power of Single Carrier Level

\*\* For the tight control of the pinch-off voltage range, we divide TC2571 into 3 model numbers to fit customer design requirement  
(1)TC2571P1519 : V<sub>p</sub> = -1.5V to -1.9V (2)TC2571P1620 : V<sub>p</sub> = -1.6V to -2.0V (3)TC2571P1721 : V<sub>p</sub> = -1.7V to -2.1V

If required, customer can specify the requirement in purchasing document. For special V<sub>p</sub> requirement, please contact factory for details.

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25 °C)**

Symbol	Parameter	Rating
V <sub>DS</sub>	Drain-Source Voltage	12 V
V <sub>GS</sub>	Gate-Source Voltage	-5 V
I <sub>DS</sub>	Drain Current	I <sub>DSS</sub>
P <sub>in</sub>	RF Input Power, CW	26 dBm
P <sub>T</sub>	Continuous Dissipation	3.8 W
T <sub>CH</sub>	Channel Temperature	175 °C
T <sub>STG</sub>	Storage Temperature	- 65 °C to +175 °C

**RECOMMENDED OPERATING CONDITION**

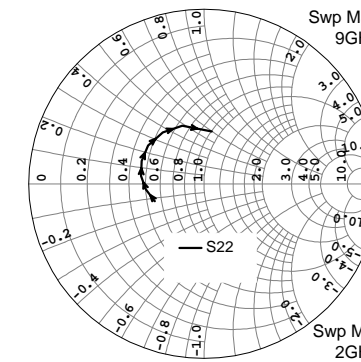
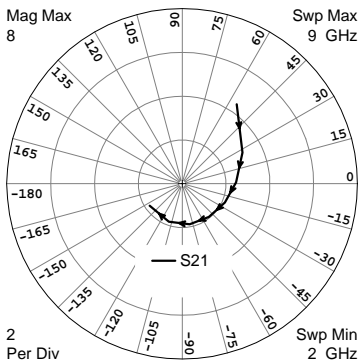
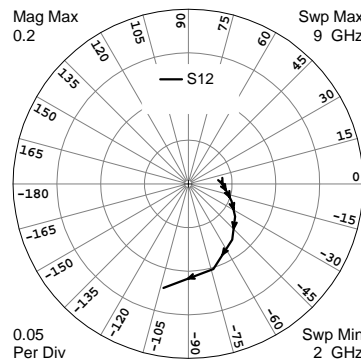
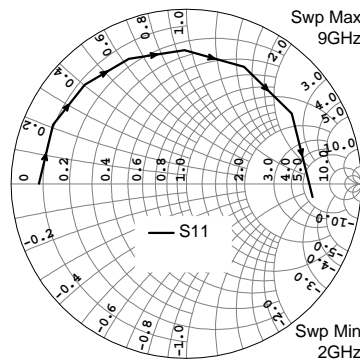
Symbol	Parameter	Rating
V <sub>DS</sub>	Drain to Source Voltage	8 V
I <sub>p</sub>	Drain Current	300 mA

**HANDLING PRECAUTIONS :**

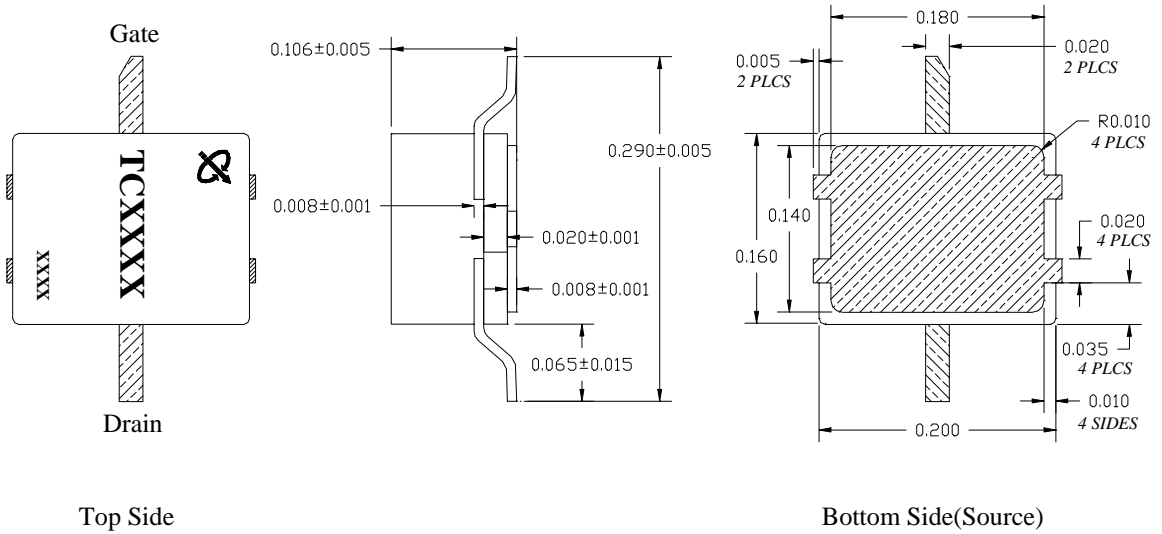
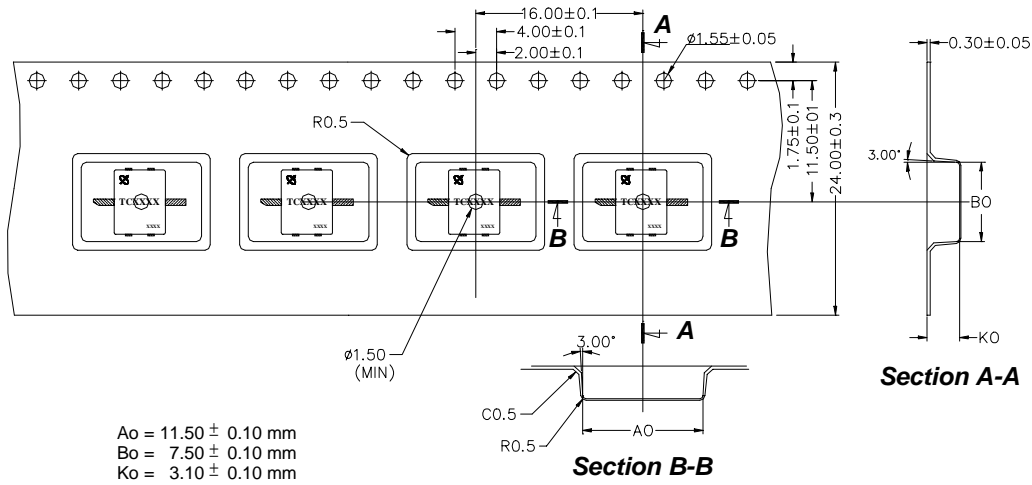
The user must operate in a clean, dry environment. Electrostatic Discharge(ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. The static discharge must less than 300V.

**TYPICAL SCATTERING PARAMETERS (T<sub>A</sub>=25°C)**

Power Bias : V<sub>DS</sub> = 8 V, I<sub>DS</sub> = 300 mA



FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.8422	179.88	4.4104	55.63	0.0378	4.41	0.2968	-160.56
3	0.8330	156.09	3.0979	27.48	0.0410	-5.11	0.3334	-174.58
4	0.8128	135.66	2.4617	1.60	0.0463	-13.48	0.3617	172.88
5	0.7880	114.61	2.1283	-23.92	0.0531	-21.93	0.3796	159.66
6	0.7645	90.83	1.9470	-50.89	0.0655	-35.02	0.3879	145.45
7	0.7467	63.85	1.8797	-79.40	0.0813	-51.82	0.3770	128.62
8	0.7247	33.82	1.8428	-109.44	0.1016	-73.69	0.3550	110.31
9	0.7245	-5.98	1.7925	-146.06	0.1226	-103.34	0.3032	81.57

**OUTLINE DIMENSIONS (in inch)**

**Tape & Reel Package Orientation (mm)**


Standard Reel Size	7"
Standard Reel Quantity	500