

1 W 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: $BV_{DGO} \geq 15$ V
- $L_g = 0.35 \mu\text{m}$, $W_g = 2.4$ mm
- Tight V_p ranges control
- High RF input power handling capability
- 100 % DC Tested
- Low Cost Ceramic Package

PHOTO ENLARGEMENT



DESCRIPTION

The TC2571 is packaged with the TC1501 Pseudomorphic High Electron Mobility Transistor (PHEMT) GaAs Power chip. The Cu-based ceramic package provides excellent thermal conductivity for the GaAs FET. All devices are 100% DC tested to assure consistent quality. Typical applications include high dynamic range power amplifiers for commercial and military high performance power applications.

ELECTRICAL SPECIFICATIONS ($T_A=25$)

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Gain Compression Point, $f = 6\text{GHz}$, $V_{DS} = 8$ V, $I_{DS} = 240$ mA	29.5	30		dBm
G_{1dB}	Power Gain at 1dB Gain Compression, $f = 6\text{GHz}$, $V_{DS} = 8$ V, $I_{DS} = 240$ mA		11		dB
IP3	Intercept Point of the 3 rd -order Intermodulation, $f = 6\text{GHz}$, $V_{DS} = 8$ V, $I_{DS} = 240$ mA, $*P_{SCL} = 17$ dBm		40		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 6\text{GHz}$		43		dB
I_{DSS}	Saturated Drain-Source Current at $V_{DS} = 2$ V, $V_{GS} = 0$ V		600		mA
g_m	Transconductance at $V_{DS} = 2$ V, $V_{GS} = 0$ V		400		mS
V_p	Pinch-off Voltage at $V_{DS} = 2$ V, $I_D = 4.8$ mA		-1.7**		Volts
BV_{DGO}	Drain-Gate Breakdown Voltage at $I_{DGO} = 1.2$ mA	15	18		Volts
R_{th}	Thermal Resistance		20		°C/W

* P_{SCL} : 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 : $V_p = -1.5\text{V}$ to -1.9V (2)TC2571P1620 : $V_p = -1.6\text{V}$ to -2.0V (3)TC2571P1721 : $V_p = -1.7\text{V}$ to -2.1V

If required, customer can specify the requirement in purchasing document. For special V_p requirement, please contact factory for details.

ABSOLUTE MAXIMUM RATINGS (T_A=25 °C)

Symbol	Parameter	Rating
V _{DS}	Drain-Source Voltage	12 V
V _{GS}	Gate-Source Voltage	-5 V
I _{DS}	Drain Current	I _{DSS}
P _{in}	RF Input Power, CW	28 dBm
P _T	Continuous Dissipation	3.8 W
T _{CH}	Channel Temperature	175 °C
T _{STG}	Storage Temperature	- 65 °C to +175 °C

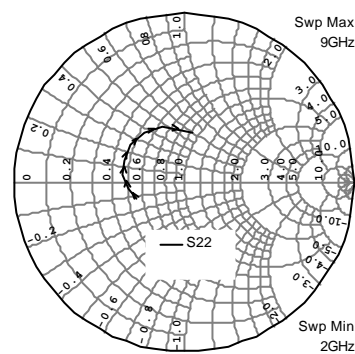
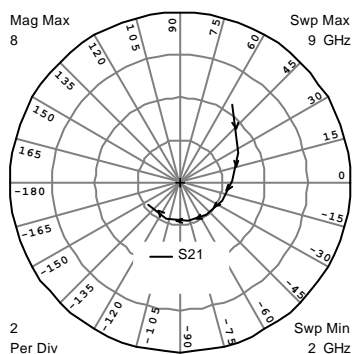
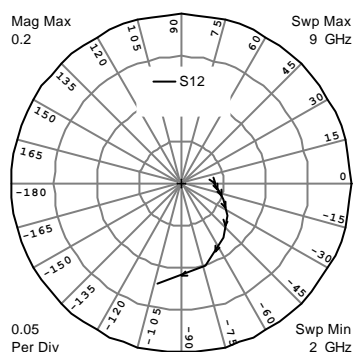
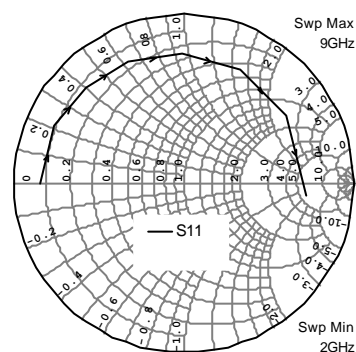
RECOMMENDED OPERATING CONDITION

Symbol	Parameter	Rating
V _{DS}	Drain to Source Voltage	8 V
I _D	Drain Current	240 mA

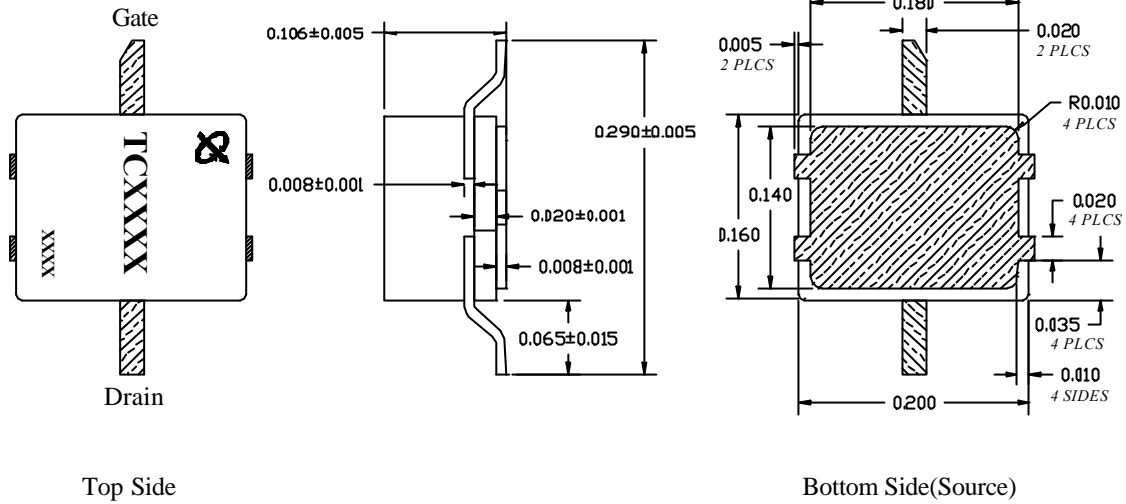
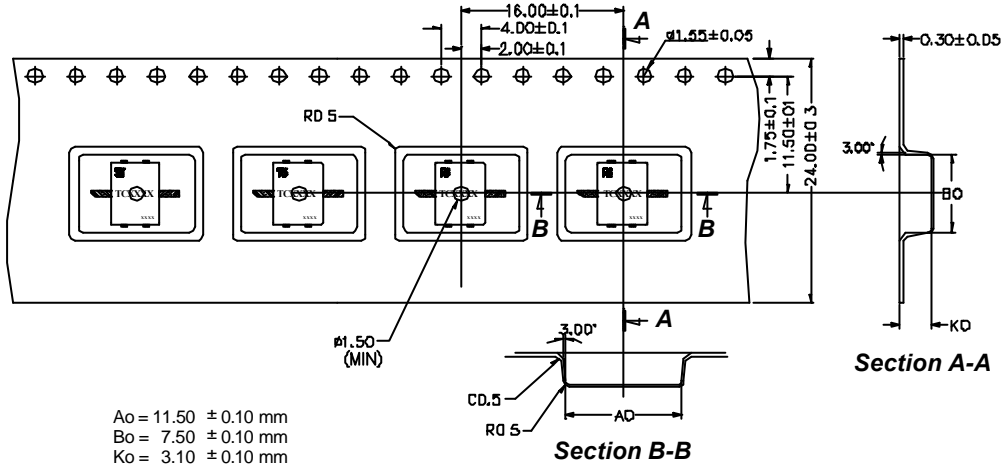
HANDLING PRECAUTIONS :

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_A=25)

 Power Bias : V_{DS} = 8 V, I_{DS} = 240 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 (Unit: inch)

Tape & Reel Package Orientation (Unit: mm)


Standard Reel Size	7"
Standard Reel Quantity	400