TRANSCOM

TC2491

REV.2_04/12/2004

0.5 W Flange Ceramic Packaged PHEMT GaAs Power FETs

FEATURES

- 0.5 W Typical Output Power at 6 GHz
- 15 dB Typical Linear Power Gain at 6 GHz
- High Linearity:
  IP3 = 37 dBm Typical at 6 GHz
- High Power Added Efficiency:
  Nominal PAE of 40 % at 6 GHz
- Suitable for High Reliability Application
- Breakdown Voltage:
  $BV_{DGO} \geq 15$ V
- Lg = 0.35 μm, Wg = 1.2 mm
- 100 % DC Tested
- Flange Ceramic Package

PHOTO ENLARGEMENT

DESCRIPTION

The TC2491 is packaged with the TC1401 Pseudomorphic High Electron Mobility Transistor (PHEMT) chip. The flange ceramic package provides the best thermal conductivity for the GaAs FET. All devices are 100% DC and RF 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_A=25 °C)

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Gain Compression Point , f = 6GHz V_{DS} = 8 V, I_{DS} = 150 mA	26.5	27		dBm
G_L	Linear Power Gain, f = 6GHz V_{DS} = 8 V, I_{DS} = 150 mA		15		dB
IP3	Intercept Point of the 3rd-order Intermodulation, f = 6GHz V_{DS} = 8 V, I_{DS} = 150 mA, *P_{SCL} = 14 dBm		37		dBm
PAE	Power Added Efficiency at 1dB Compression Power, f = 6GHz		40		%
I_{DSS}	Saturated Drain-Source Current at V_{DS} = 2 V, V_{GS} = 0 V		300		mA
g_m	Transconductance at V_{DS} = 2 V, V_{GS} = 0 V		200		mS
V_P	Pinch-off Voltage at V_{DS} = 2 V, I_D = 2.4 mA		-1.7**		Volts
BV_{DGO}	Drain-Gate Breakdown Voltage at I_{DGO} =0.6 mA	15	18		Volts
R_{th}	Thermal Resistance		23		°C/W

Note: * P_{SCL}: Output Power of Single Carrier Level

** For the tight control of the pinch-off voltage range, we divide TC2491 into 3 model numbers to fit customer design requirement (1)TC2491P1519 : Vp = -1.5V to -1.9V (2)TC2491P1620 : Vp = -1.6V to -2.0V (3)TC2491P1721 : Vp = -1.7V to -2.1V
If required, customer can specify the requirement in purchasing document. For special Vp requirement, please contact factory for details.

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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	23 dBm
P_T	Continuous Dissipation	1.9 W
T_{CH}	Channel Temperature	175 °C
T_{STG}	Storage Temperature	- 65 °C to +175 °C

RECOMMANDED OPERATING CONDITION

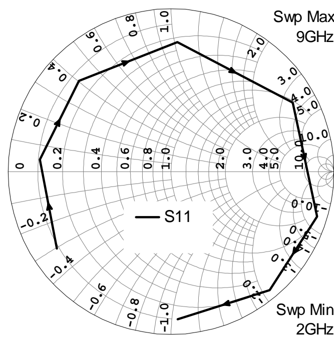
Symbol	Parameter	Rating
V_{DS}	Drain to Source Voltage	8 V
I_D	Drain Current	150 mA

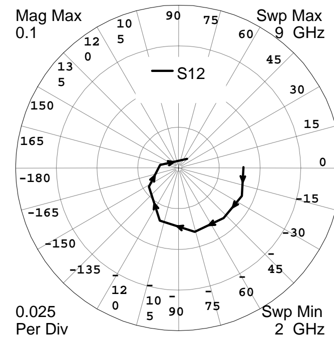
HANDLING PRECAUTIONS:

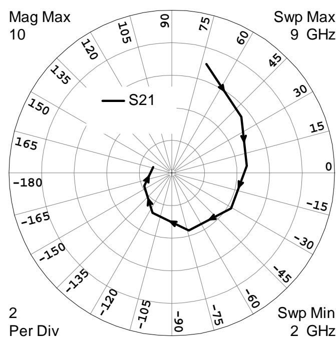
The user must operate in a clean, dry environment. Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. The static discharge must be less than 300V.

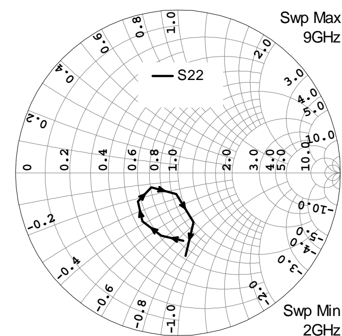
TYPICAL SCATTERING PARAMETERS (T_A=25 °C)

V_{DS} = 8 V, I_{DS} = 150 mA









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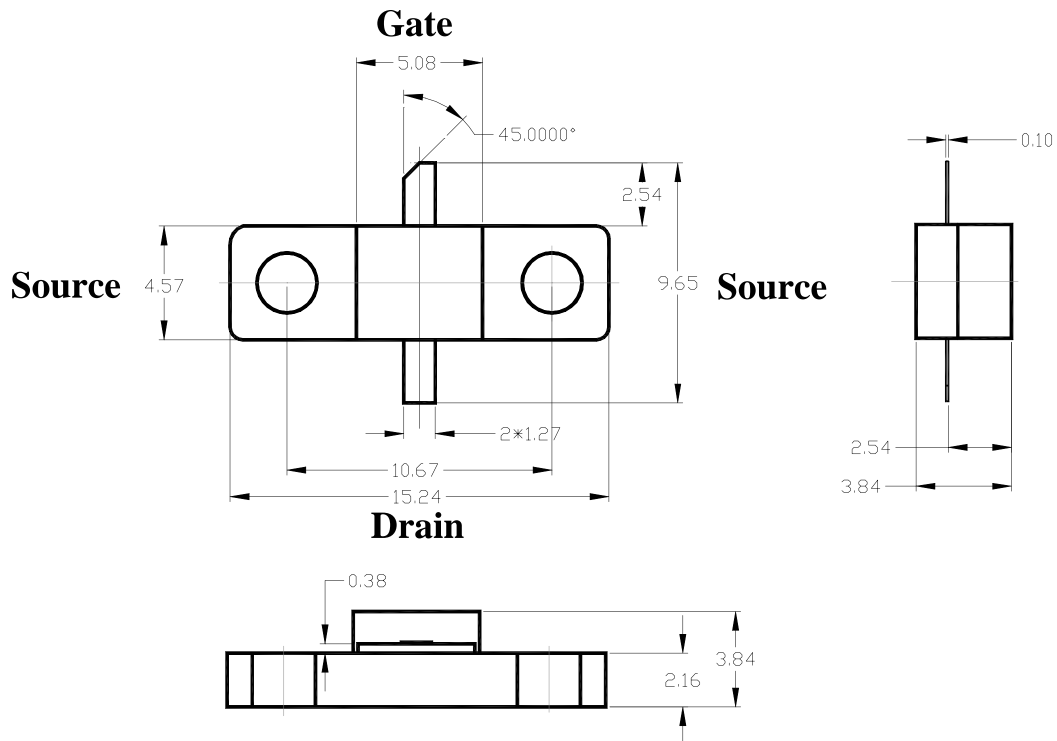
FREQUENCY (GHz)	S11 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 ANG
2	0.8455	-146.07	7.0138	72.47	0.0398	0.67	0.4193	-85.61
3	0.8075	174.44	5.4789	38.75	0.0426	-24.40	0.3998	-104.93
4	0.7944	135.48	4.6247	5.59	0.0415	-48.07	0.3699	-126.51
5	0.7954	86.86	4.2254	-31.28	0.0404	-76.10	0.3029	-144.68
6	0.8582	29.13	3.6581	-73.88	0.0345	-110.20	0.1848	-151.48
7	0.9370	-17.10	2.7289	-115.82	0.0215	-147.61	0.1316	-94.58
8	0.9470	-50.56	1.8813	-155.07	0.0112	170.65	0.3205	-72.70
9	0.9074	-87.80	1.1999	162.03	0.0076	44.87	0.5130	-84.93

OUTLINE DIMENSIONS (in mm)



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