

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
- $L_g = 0.35 \mu\text{m}$, $W_g = 1.2$ mm
- Tight V_p ranges control
- High RF input power handling capability
- 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 amplifiers for commercial and military high performance power applications.

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

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Gain Compression Point, $f = 6\text{GHz}$, $V_{DS} = 8$ V, $I_{DS} = 120$ mA	26.5	27		dBm
G_L	Linear Power Gain, $f = 6\text{GHz}$, $V_{DS} = 8$ V, $I_{DS} = 120$ mA		15		dB
IP3	Intercept Point of the 3 rd -order Intermodulation, $f = 6\text{GHz}$, $V_{DS} = 8$ V, $I_{DS} = 120$ mA, $*P_{SCL} = 14$ dBm		37		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 6\text{GHz}$		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		25		$^\circ\text{C}/\text{W}$

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 : $V_p = -1.5\text{V}$ to -1.9V (2)TC2491P1620 : $V_p = -1.6\text{V}$ to -2.0V (3)TC2491P1721 : $V_p = -1.7\text{V}$ 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	26 dBm
P _T	Continuous Dissipation	1.9 W
T _{CH}	Channel Temperature	175 °C
T _{STG}	Storage Temperature	- 65 °C to +175 °C

RECOMMENDED OPERATING CONDITION

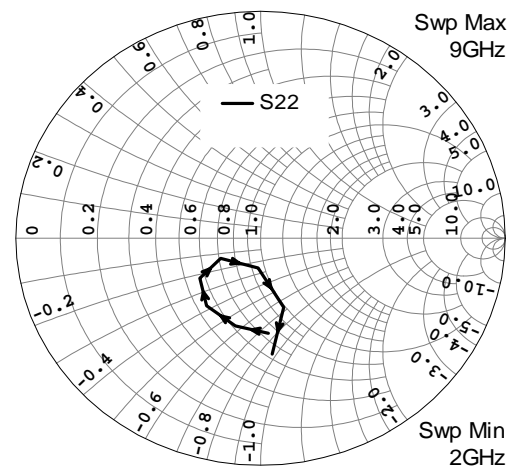
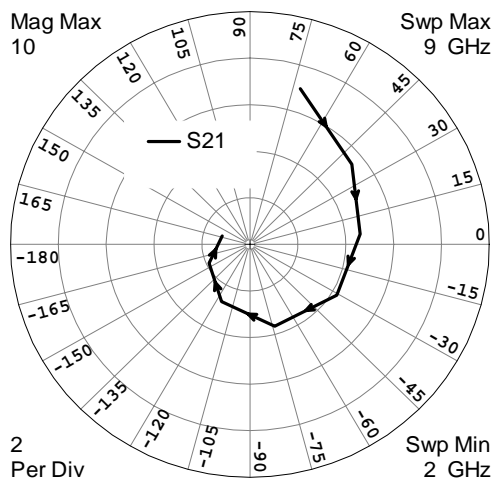
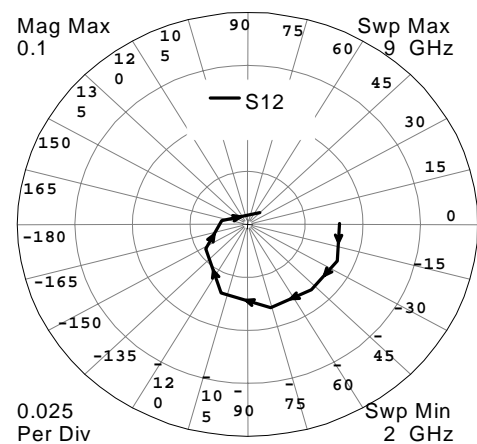
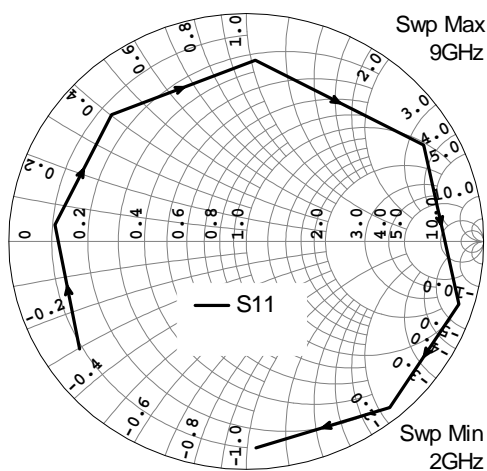
Symbol	Parameter	Rating
V _{DS}	Drain to Source Voltage	8 V
I _D	Drain Current	120 mA

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} = 120 mA



FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	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 (Unit: mm)
