



Preliminary

January 2002

2 W Flange Ceramic Packaged PHEMT GaAs Power FETs

FEATURES

- 2 W Typical Output Power at 2.45 GHz
- 14 dB Typical Linear Power Gain at 2.45 GHz
- High Linearity:
IP3 = 43 dBm Typical at 2.45 GHz
- High Power Added Efficiency:
Nominal PAE of 43 % at 2.45 GHz
- Suitable for High Reliability Application
- Breakdown Voltage:
BV_{DGO} ≥ 18 V
- L_g = 0.6 μm, W_g = 5 mm
- 100 % DC Tested
- Flange Ceramic Package

PHOTO ENLARGEMENT



DESCRIPTION

The TC2696 is packaged with the TC1606 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, $f = 2.45\text{GHz}$ $V_{DS} = 8\text{ V}, I_{DS} = 600\text{ mA}$	32.5	33		dBm
G _L	Linear Power Gain, $f = 2.45\text{GHz}$ $V_{DS} = 8\text{ V}, I_{DS} = 600\text{ mA}$	12	14		dB
IP3	Intercept Point of the 3 rd -order Intermodulation, $f = 2.45\text{GHz}$ $V_{DS} = 8\text{ V}, I_{DS} = 600\text{ mA}, *P_{SCL} = 20\text{ dBm}$		43		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 2.45\text{GHz}$		43		%
I _{DSS}	Saturated Drain-Source Current at $V_{DS} = 2\text{ V}, V_{GS} = 0\text{ V}$		1.2		A
g _m	Transconductance at $V_{DS} = 2\text{ V}, V_{GS} = 0\text{ V}$		850		mS
V _P	Pinch-off Voltage at $V_{DS} = 2\text{ V}, I_D = 10\text{ mA}$		-1.7		Volts
BV _{DGO}	Drain-Gate Breakdown Voltage at $I_{DGO} = 2.5\text{ mA}$	15	18		Volts
R _{th}	Thermal Resistance		7		°C/W

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

TC2696

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	6 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	600 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} = 600 mA

FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.9232	175.28	1.8019	58.43	0.0288	-14.46	0.6268	174.83
3	0.9179	161.34	1.2279	38.12	0.0303	-26.85	0.6531	167.56
4	0.9098	148.40	0.9600	19.07	0.0327	-38.61	0.6737	158.81
5	0.8978	134.59	0.8236	0.11	0.0364	-50.96	0.6847	148.28
6	0.8806	118.62	0.7599	-19.79	0.0420	-64.88	0.6839	135.52
7	0.8574	99.05	0.7426	-41.79	0.0496	-81.49	0.6699	119.60
8	0.8295	74.18	0.7529	-67.22	0.0595	-102.04	0.6430	98.92
9	0.8045	42.52	0.7648	-97.22	0.0701	-127.59	0.6085	71.06

OUTLINE DIMENSIONS (in mm)

