0.5 W Low-Cost Packaged PHEMT GaAs Power FETs

FEATURES

- 27 dBm Typical Output Power at 6 GHz
- 11 dB Typical Linear Power Gain at 6 GHz
- High Linearity: IP3 = 37 dBm Typical at 6 GHz
- High Power Added Efficiency:
  Nominal PAE of 37 % at 6 GHz
- Breakdown Voltage: $BV_{DGO} \geq 15$ V
- Lg = 0.35 μm, Wg = 1.2 mm
- Tight Vp ranges control
- High RF input power handling capability
- 100 % DC Tested
- Micro-X Metal Ceramic Package

PHOTO ENLARGEMENT

DESCRIPTION

The TC2481 is packaged with the TC1401 Pseudomorphic High Electron Mobility Transistor (PHEMT) chip. All devices are 100% DC tested to assure consistent quality. Typical applications include high dynamic range power amplifiers for commercial applications.

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} = 120 mA	26.5	27		dBm
G_L	Linear Power Gain , f = 6GHz V_{DS} = 8 V, I_{DS} = 120 mA		11		dB
IP3	Intercept Point of the 3rd-order Intermodulation, f = 6GHz V_{DS} = 8 V, I_{DS} = 120 mA, *P_{SCL} = 14 dBm		37		dBm
PAE	Power Added Efficiency at 1dB Compression Power, f = 6GHz		37		%
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		50		°C/W

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

** For the tight control of the pinch-off voltage range, we divide TC2481 into 3 model numbers to fit customer design requirement
(1)TC2481P1519 : Vp = -1.5V to -1.9V (2)TC2481P1620 : Vp = -1.6V to -2.0V (3)TC2481P1721 : 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	26 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

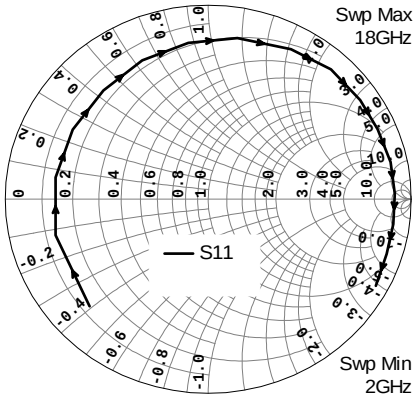
Symbol	Parameter	Rating
V_{DS}	Drain to Source Voltage	8 V
I_D	Drain Current	120 mA

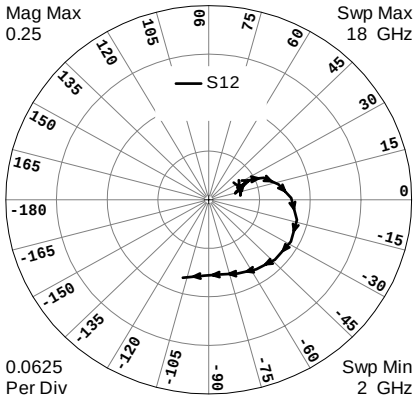
HANDLING PRECAUTIONS:

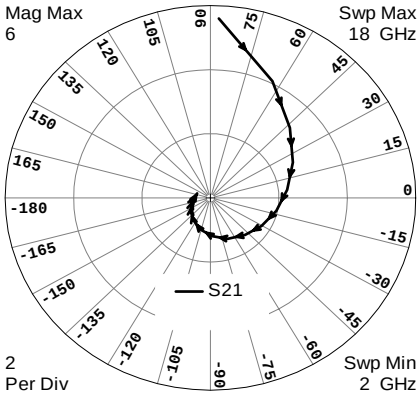
The user must operate in a clean, dry environment. Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. The static discharge must be less than 300V.

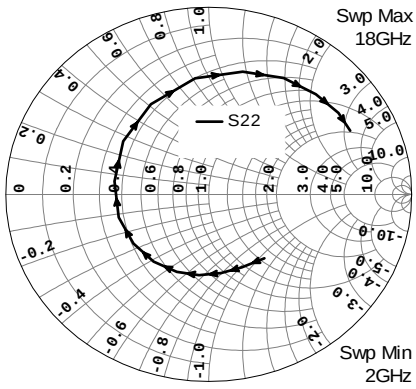
TYPICAL SCATTERING PARAMETERS (T_A=25 °C)

V_{DS} = 8 V, I_{DS} = 120 mA



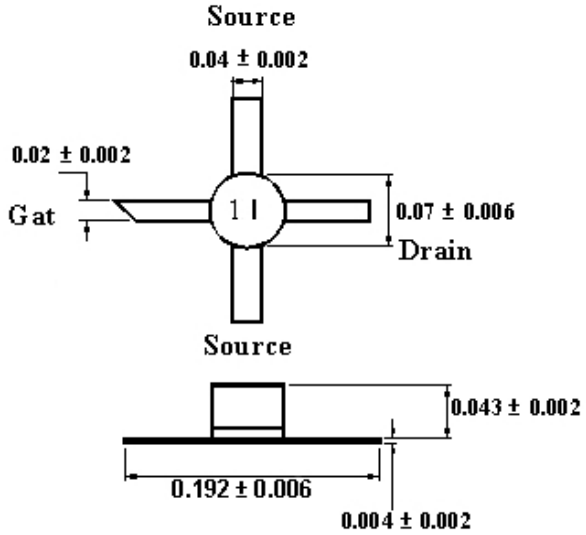




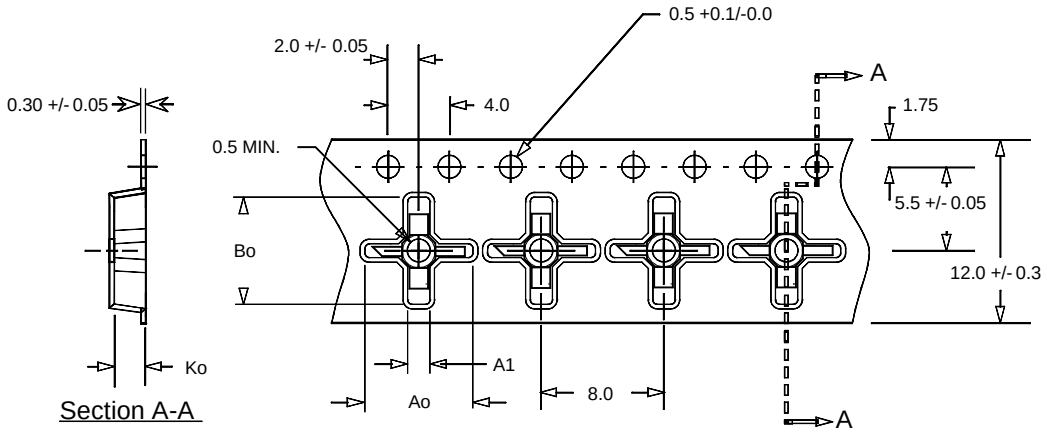


FREQUENCY	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.8032	-136.63	5.5988	87.50	0.0409	26.99	0.4377	-51.36
3	0.7749	-166.09	4.0646	63.59	0.0413	19.35	0.4223	-67.29
4	0.7596	171.59	3.1927	43.25	0.0420	20.20	0.4255	-81.72
5	0.7572	151.76	2.6479	24.67	0.0443	22.85	0.4343	-96.23
6	0.7624	132.64	2.2554	6.40	0.0507	26.86	0.4433	-110.80
7	0.7862	114.43	1.9690	-11.83	0.0603	26.12	0.4510	-127.09
8	0.8118	96.88	1.7325	-30.21	0.0733	22.60	0.4549	-144.68
9	0.8421	80.20	1.5329	-48.83	0.0881	12.91	0.4604	-164.61
10	0.8733	62.17	1.3715	-68.33	0.1015	1.29	0.4701	171.32
11	0.9024	47.87	1.2003	-87.33	0.1115	-13.43	0.5072	146.04
12	0.9065	34.32	1.0285	-106.37	0.1148	-28.10	0.5596	120.64
13	0.9086	23.39	0.8658	-125.06	0.1122	-43.31	0.6243	96.18
14	0.9181	11.98	0.7218	-142.69	0.1067	-56.87	0.6769	75.72
15	0.9199	1.79	0.6003	-158.30	0.1014	-69.46	0.7228	59.28
16	0.9213	-8.00	0.5110	-172.76	0.0975	-81.21	0.7517	45.41
17	0.9237	-17.81	0.4432	173.68	0.0978	-93.09	0.7725	34.26
18	0.9381	-28.37	0.4147	160.89	0.1054	-107.70	0.7753	25.98

OUTLINE DIMENSIONS (Unit: inch)



TAPE & REEL PACKAGE ORIENTATION (Unit: mm)



Ao = 7.0 mm
A1 = 1.45 mm
Bo = 7.0 mm
B1 = 0.9 mm
Ko = 2.0 mm

Standard Reel Size	7”
Standard Reel Quantity	1000