Plastic Packaged Low Noise PHEMT GaAs FETs

FEATURES

- 1.5 dB Typical Noise Figure at 12 GHz
- High Associated Gain: Ga = 7 dB Typical at 12 GHz
- 21.5 dBm Typical Power at 12 GHz
- 8 dB Typical Linear Power Gain at 12 GHz
- Lg = 0.25 µm, Wg = 300 µm
- Tight Vp ranges control
- High RF input power handling capability
- 100 % DC Tested
- Low Cost Plastic Micro-X Package

PHOTO ENLARGEMENT

DESCRIPTION

The TC2201 is a high performance field effect transistor housed in a plastic package with TC1201 PHEMT Chip. Its low noise figure makes this device suitable for use in low noise amplifiers. All devices are 100 % DC tested to assure consistent quality.

ELECTRICAL SPECIFICATIONS (T_A=25 °C)

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
NF	Noise Figure at V_{DS} = 4 V, I_{DS} = 25 mA, f = 12GHz		1.5	2	dB
G_a	Associated Gain at V_{DS} = 4 V, I_{DS} = 25 mA, f = 12GHz	6	7		dB
P_{1dB}	Output Power at 1dB Gain Compression Point, f = 12GHz V_{DS} = 6 V, I_{DS} = 40 mA	20.5	21.5		dBm
G_L	Linear Power Gain, f = 12GHz V_{DS} = 6 V, I_{DS} = 40 mA	7	8		dB
I_{DSS}	Saturated Drain-Source Current at V_{DS} = 2 V, V_{GS} = 0 V		90		mA
g_m	Transconductance at V_{DS} = 2 V, V_{GS} = 0 V		100		mS
V_P	Pinch-off Voltage at V_{DS} = 2 V, I_D = 0.6mA		-1.0*		Volts
BV_{DGO}	Drain-Gate Breakdown Voltage at I_{DGO} = 0.15mA	9	12		Volts
R_{th}	Thermal Resistance		150		°C/W

ABSOLUTE MAXIMUM RATINGS (T_A=25 °C)

Symbol	Parameter	Rating
V_{DS}	Drain-Source Voltage	7.0 V
V_{GS}	Gate-Source Voltage	-3.0 V
I_{DS}	Drain Current	I_{DSS}
I_{GS}	Gate Current	300 µA
P_{in}	RF Input Power, CW	21 dBm
P_T	Continuous Dissipation	400 mW
T_{CH}	Channel Temperature	175 °C
T_{STG}	Storage Temperature	- 65 °C to +175 °C

* For the tight control of the pinch-off voltage range, we divide TC2201 into 3 model numbers to fit customer design requirement
(1) TC2201P0710 : Vp = -0.7V to -1.0V
(2) TC2201P0811 : Vp = -0.8V to -1.1V
(3) TC2201P0912 : Vp = -0.9V to -1.2V
If required, customer can specify the requirement in purchasing document. For special Vp requirement, please contact factory for details.

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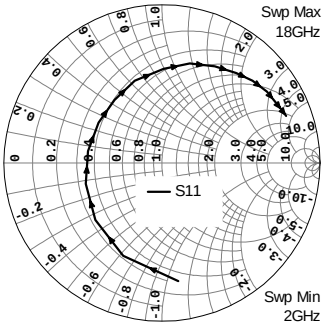
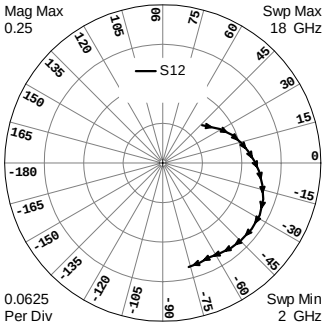
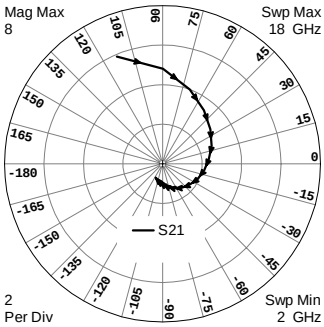
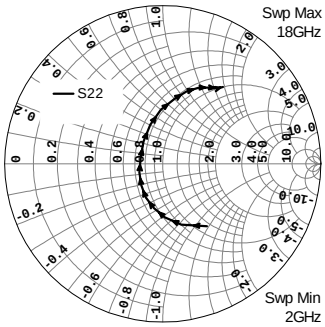
TYPICAL SCATTERING PARAMETERS (T_A=25 °C)

V_{DS} = 4 V, I_{DS} = 25 mA





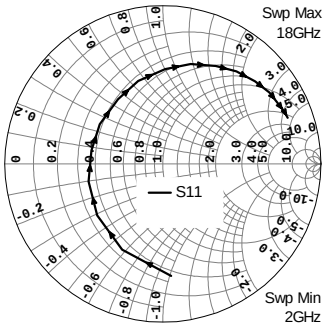


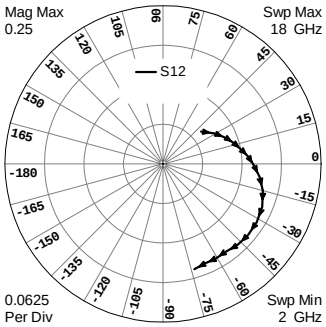


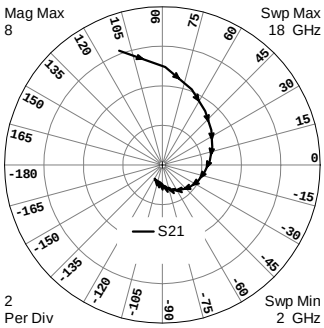
FREQUENCY	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.7533	-82.10	5.8916	113.12	0.0859	43.82	0.4839	-54.70
3	0.6364	-112.71	4.8047	89.78	0.1056	30.65	0.4017	-73.14
4	0.5532	-139.52	4.0041	69.80	0.1186	21.68	0.3378	-87.89
5	0.5000	-164.62	3.4244	52.15	0.1288	13.94	0.2851	-101.66
6	0.4738	170.81	2.9889	35.68	0.1373	7.11	0.2373	-117.05
7	0.4758	147.55	2.6546	20.03	0.1457	0.62	0.1922	-135.22
8	0.4993	127.04	2.3605	5.53	0.1530	-4.93	0.1572	-159.54
9	0.5470	108.29	2.1342	-9.88	0.1612	-12.31	0.1453	164.90
10	0.5944	89.06	1.9251	-24.84	0.1688	-19.81	0.1859	130.54
11	0.6526	74.32	1.7184	-39.43	0.1741	-28.26	0.2586	107.73
12	0.6960	61.35	1.5301	-53.55	0.1752	-36.56	0.3416	92.13
13	0.7377	50.52	1.3506	-66.92	0.1737	-44.72	0.4175	79.61
14	0.7730	42.23	1.1924	-78.45	0.1721	-50.95	0.4820	71.77
15	0.8017	34.20	1.0451	-89.52	0.1687	-57.89	0.5343	64.55
16	0.8164	27.35	0.9270	-99.93	0.1662	-63.83	0.5688	57.79
17	0.8308	23.01	0.8452	-108.84	0.1679	-69.81	0.5912	53.85
18	0.8402	20.69	0.7873	-116.75	0.1692	-75.99	0.6171	51.95

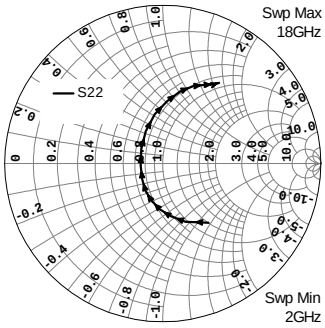
TYPICAL SCATTERING PARAMETERS (T_A=25 °C)

V_{DS} = 6 V, I_{DS} = 40 mA









FREQUENCY	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.7092	-85.70	6.1747	110.84	0.0793	40.30	0.4731	-52.17
3	0.6001	-115.37	4.9530	88.24	0.0956	30.10	0.3941	-68.76
4	0.5269	-141.91	4.0928	68.69	0.1077	22.43	0.3361	-81.69
5	0.4820	-166.74	3.4853	51.43	0.1175	15.94	0.2897	-93.65
6	0.4600	169.32	3.0355	35.32	0.1261	10.21	0.2452	-106.84
7	0.4702	147.81	2.6901	19.78	0.1359	4.41	0.2032	-122.75
8	0.4971	124.85	2.4024	4.75	0.1444	-1.24	0.1635	-142.30
9	0.5462	106.66	2.1605	-10.35	0.1540	-7.63	0.1392	-175.30
10	0.5999	88.59	1.9666	-25.56	0.1638	-15.08	0.1639	145.59
11	0.6546	74.41	1.7593	-39.71	0.1711	-23.34	0.2298	117.55
12	0.7024	61.65	1.5634	-54.17	0.1746	-31.78	0.3165	99.21
13	0.7466	51.47	1.3909	-67.87	0.1751	-39.88	0.3953	85.80
14	0.7831	41.75	1.2182	-80.02	0.1743	-47.33	0.4682	76.51
15	0.8114	33.77	1.0667	-91.60	0.1705	-54.30	0.5263	68.41
16	0.8244	27.17	0.9435	-102.17	0.1711	-61.20	0.5666	61.49
17	0.8371	23.17	0.8587	-111.25	0.1708	-66.78	0.5947	57.19
18	0.8423	20.30	0.7991	-118.61	0.1736	-73.44	0.6221	55.04

OUTLINE DIMENSIONS **(Unit: mm)**