Plastic Packaged Low Noise PHEMT GaAs FETs

FEATURES

- 1.5 dB Typical Noise Figure at 12 GHz
- High Associated Gain: Ga = 8 dB Typical at 12 GHz
- 18.5 dBm Typical Power at 12 GHz
- 9 dB Typical Linear Power Gain at 12 GHz
- Lg = 0.25 µm, Wg = 160 µm
- Tight Vp ranges control
- High RF input power handling capability
- 100 % DC Tested
- Low Cost Plastic Micro-X Package

PHOTO ENLARGEMENT

DESCRIPTION

The TC2101 is a high performance field effect transistor housed in a plastic package with TC1101 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} = 2 V, I_{DS} = 10 mA, f = 12GHz		1.5	1.8	dB
G_a	Associated Gain at V_{DS} = 2 V, I_{DS} = 10 mA, f = 12GHz	7	8		dB
P_{1dB}	Output Power at 1dB Gain Compression Point, f = 12GHz V_{DS} = 6 V, I_{DS} = 25 mA	17.5	18.5		dBm
G_L	Linear Power Gain, f = 12GHz V_{DS} = 6 V, I_{DS} = 25 mA	8	9		dB
I_{DSS}	Saturated Drain-Source Current at V_{DS} = 2 V, V_{GS} = 0 V		48		mA
g_m	Transconductance at V_{DS} = 2 V, V_{GS} = 0 V		55		mS
V_P	Pinch-off Voltage at V_{DS} = 2 V, I_D = 0.32mA		-1.0*		Volts
BV_{DGO}	Drain-Gate Breakdown Voltage at I_{DGO} = 0.08mA	9	12		Volts
R_{th}	Thermal Resistance		250		°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	160 µA
P_{in}	RF Input Power, CW	18 dBm
P_T	Continuous Dissipation	150 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 TC2101 into 3 model numbers to fit customer design requirement
(1) TC2101P0710 : Vp = -0.7V to -1.0V
(2) TC2101P0811 : Vp = -0.8V to -1.1V
(3) TC2101P0912 : 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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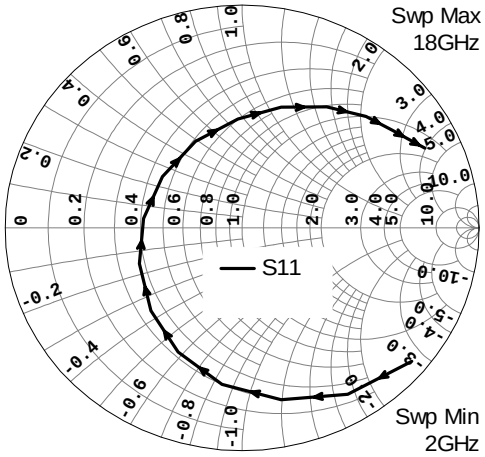
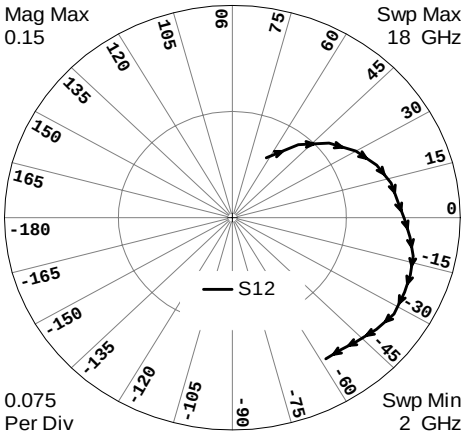
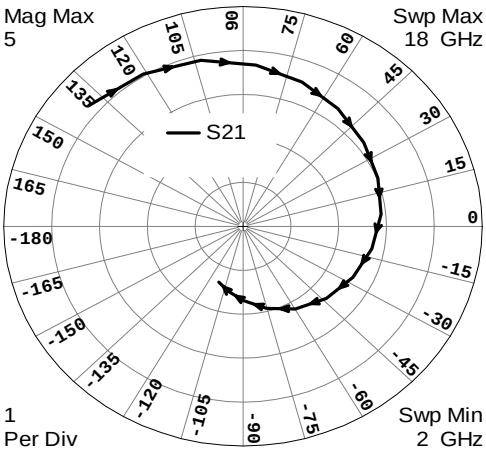
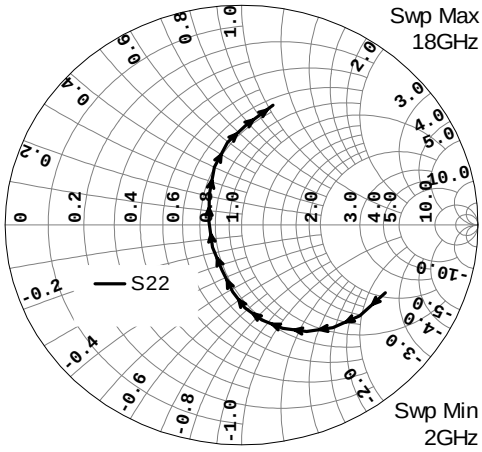
TYPICAL SCATTERING PARAMETERS (T_A=25 °C) V_{DS} = 2 V, I_{DS} = 10 mA



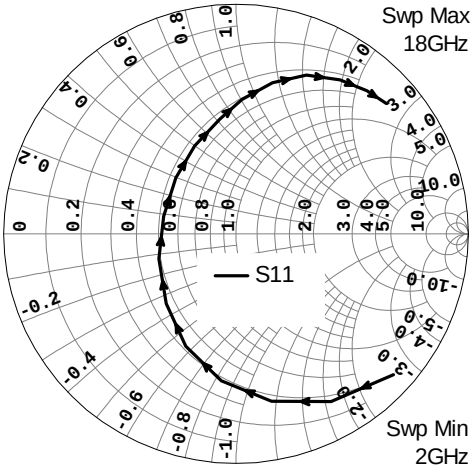


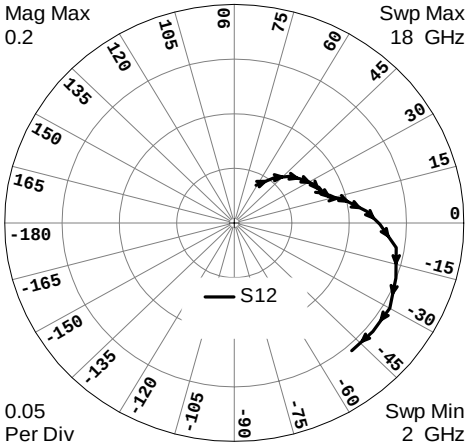


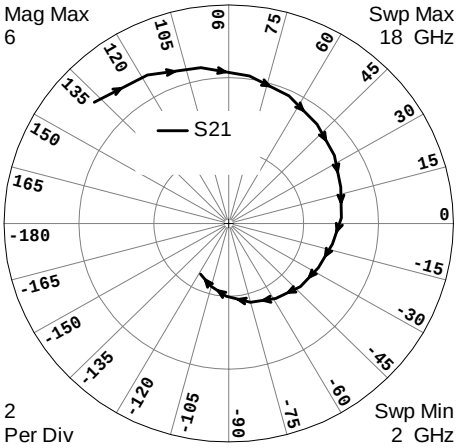


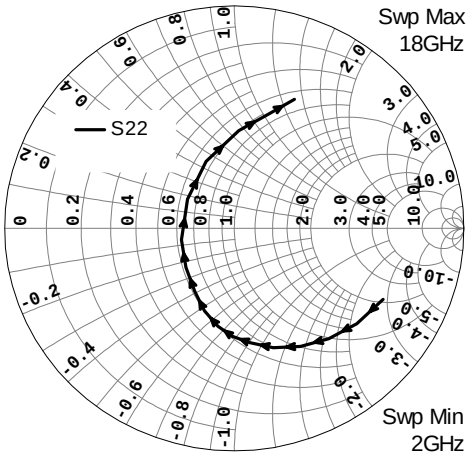
FREQUENCY	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.9332	-39.94	4.2345	139.60	0.0479	62.17	0.6820	-26.91
3	0.8691	-59.20	4.0461	121.08	0.0673	49.85	0.6478	-39.62
4	0.7888	-77.97	3.8790	103.08	0.0825	39.64	0.6063	-50.42
5	0.7071	-96.96	3.6815	85.82	0.0939	30.01	0.5571	-60.39
6	0.6190	-115.86	3.5050	69.45	0.1020	21.24	0.5019	-69.72
7	0.5355	-135.99	3.3332	53.51	0.1074	13.13	0.4395	-78.87
8	0.4622	-159.62	3.1635	36.99	0.1095	5.90	0.3760	-87.99
9	0.4177	174.21	3.0225	21.25	0.1133	-0.54	0.3060	-97.16
10	0.4071	145.51	2.8979	5.35	0.1178	-6.78	0.2197	-112.27
11	0.4350	116.89	2.7425	-10.82	0.1220	-12.84	0.1591	-140.60
12	0.4897	92.02	2.5755	-26.77	0.1239	-19.07	0.1388	174.36
13	0.5663	73.01	2.3953	-43.25	0.1250	-24.94	0.1954	134.41
14	0.6489	56.74	2.1736	-59.86	0.1262	-32.65	0.2872	113.57
15	0.7239	43.74	1.9317	-75.28	0.1235	-39.78	0.3803	98.86
16	0.7723	34.48	1.6923	-89.48	0.1197	-46.96	0.4525	87.96
17	0.8179	28.19	1.5142	-101.69	0.1176	-52.45	0.5088	80.94
18	0.8508	24.95	1.3686	-111.73	0.1172	-58.32	0.5605	76.32

TYPICAL SCATTERING PARAMETERS (T_A=25 °C) V_{DS} = 6 V, I_{DS} = 25 mA









FREQUENCY	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.9137	-42.10	4.8979	137.16	0.0395	61.31	0.7226	-26.17
3	0.8372	-60.74	4.6138	118.07	0.0538	50.15	0.6839	-38.73
4	0.7444	-78.16	4.3408	99.83	0.0646	41.21	0.6443	-50.28
5	0.6434	-95.71	4.0863	82.16	0.0722	32.98	0.6035	-61.47
6	0.5349	-113.81	3.8526	65.37	0.0780	26.66	0.5620	-72.40
7	0.4270	-134.68	3.6029	49.11	0.0809	20.57	0.5177	-82.56
8	0.3489	-161.89	3.3774	33.53	0.0842	18.01	0.4839	-91.18
9	0.3204	166.16	3.1571	18.44	0.0875	15.03	0.4454	-99.22
10	0.3560	136.66	3.0157	2.95	0.0964	13.24	0.3926	-109.15
11	0.4227	114.81	2.8309	-11.55	0.1039	9.70	0.3318	-121.05
12	0.5039	98.08	2.6800	-26.98	0.1158	5.26	0.2746	-140.16
13	0.5866	87.43	2.5836	-42.21	0.1267	-0.50	0.2362	-167.47
14	0.6763	76.55	2.4145	-58.58	0.1429	-9.10	0.2419	147.12
15	0.7546	66.32	2.2489	-74.91	0.1496	-19.76	0.3244	112.28
16	0.8058	56.26	1.9984	-91.95	0.1563	-29.92	0.4388	87.46
17	0.8394	47.89	1.7802	-106.24	0.1562	-39.48	0.5392	73.40
18	0.8609	41.28	1.5852	-118.37	0.1555	-48.81	0.6361	65.72

OUTLINE DIMENSIONS **(Unit : mm)**