

DATA SHEET

NEC

NPN SILICON RF TRANSISTOR 2SC5737

NPN SILICON RF TRANSISTOR FOR HIGH-FREQUENCY LOW NOISE FLAT-LEAD 3-PIN THIN-TYPE ULTRA SUPER MINIMOLD

FEATURES

- Low voltage operation, low phase distortion
- Ideal for VCO applications
- Flat-lead 3-pin thin-type ultra super minimold package

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
2SC5737	50 pcs (Non reel)	• 8 mm wide embossed taping
2SC5737-T1	3 kpcs/reel	• Pin 3 (collector) face the perforation side of the tape

Remark To order evaluation samples, consult your NEC sales representative.
Unit sample quantity is 50 pcs.

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^{\circ}\text{C}$)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	5	V
Collector to Emitter Voltage	V_{CEO}	3	V
Emitter to Base Voltage	V_{EBO}	2	V
Collector Current	I_C	30	mA
Total Power Dissipation	P_{tot} Note	90	mW
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^{\circ}\text{C}$

Note Mounted on $1.08\text{ cm}^2 \times 1.0\text{ mm}$ (t) glass epoxy substrate

Because this product uses high-frequency technology, avoid excessive static electricity, etc.

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	—	—	100	nA
Emitter Cut-off Current	I _{EBO}	V _{BE} = 1 V, I _C = 0 mA	—	—	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 1 V, I _C = 10 mA	70	—	140	—
RF Characteristics						
Gain Bandwidth Product	f _T	V _{CE} = 1 V, I _C = 10 mA, f = 2 GHz	10.0	12.0	—	GHz
Insertion Power Gain	S _{21e} ²	V _{CE} = 1 V, I _C = 10 mA, f = 2 GHz	7.0	9.0	—	dB
Noise Figure	NF	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	—	1.5	2.0	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 0.5 V, I _E = 0 mA, f = 1 MHz	—	0.4	0.8	pF

Notes 1. Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%

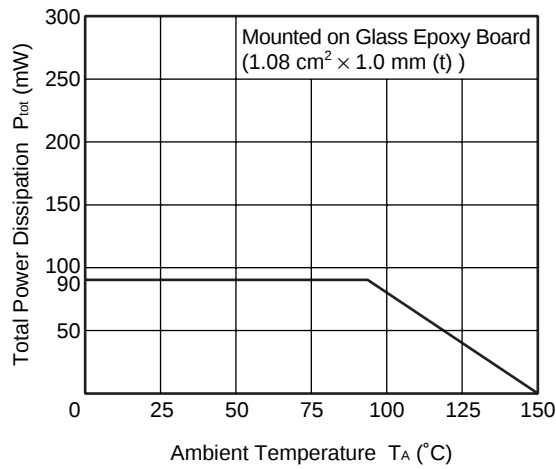
2. Collector to base capacitance measured using capacitance meter (self-balancing bridge method) when the emitter is connected to the guard pin

h_{FE} CLASSIFICATION

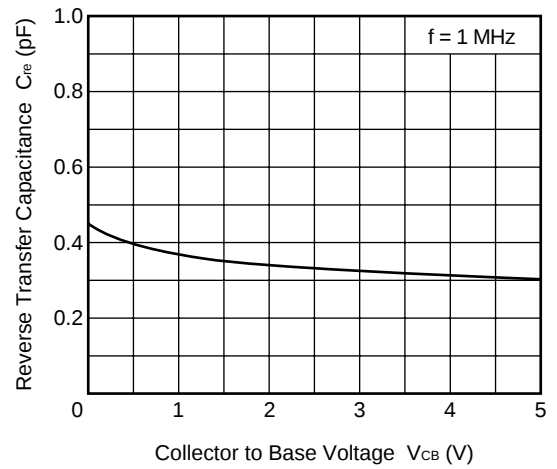
Rank	FB
Marking	UD
h _{FE} Value	70 to 140

TYPICAL CHARACTERISTICS (Unless otherwise specified, $T_A = +25^\circ\text{C}$)

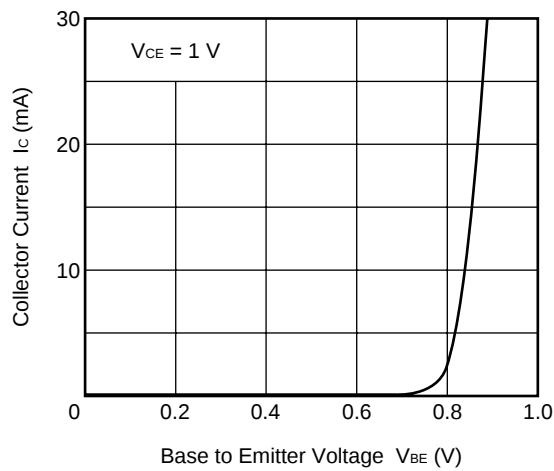
**TOTAL POWER DISSIPATION
vs. AMBIENT TEMPERATURE**



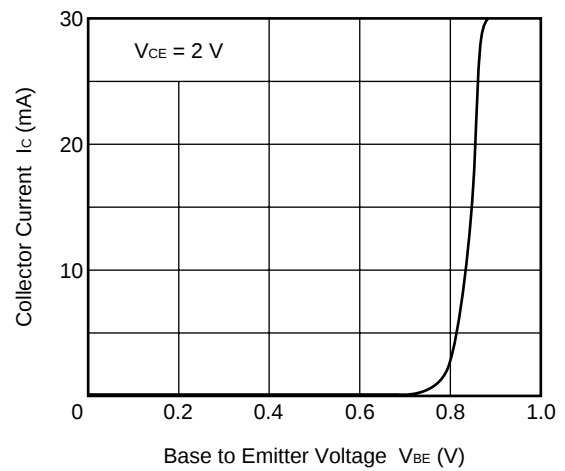
**REVERSE TRANSFER CAPACITANCE
vs. COLLECTOR TO BASE VOLTAGE**



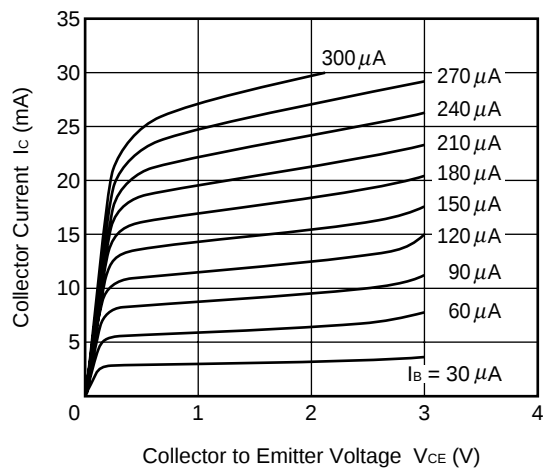
**COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE**

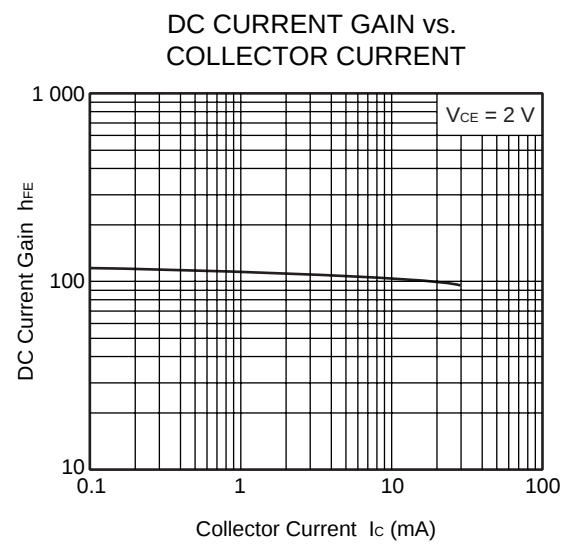
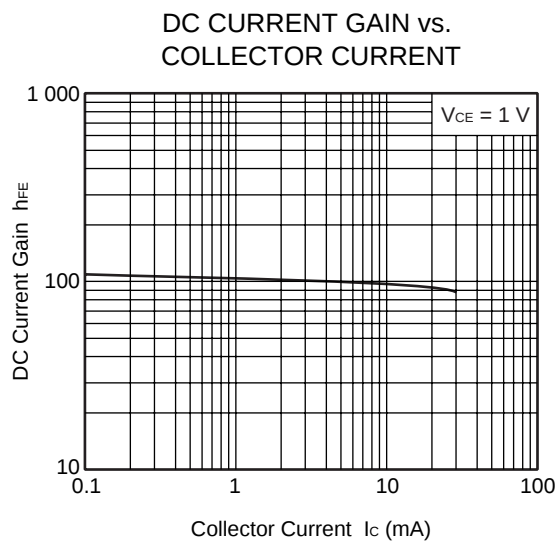


**COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE**

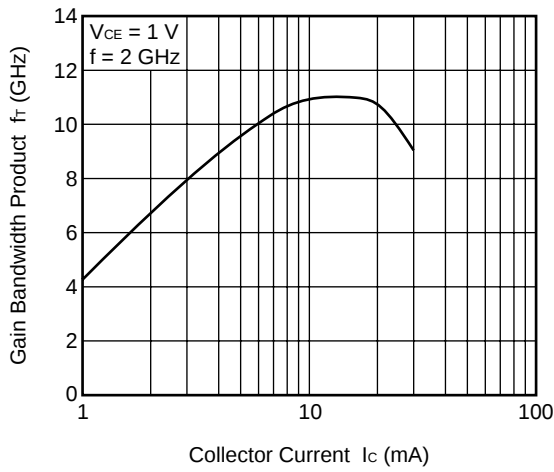


**COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE**

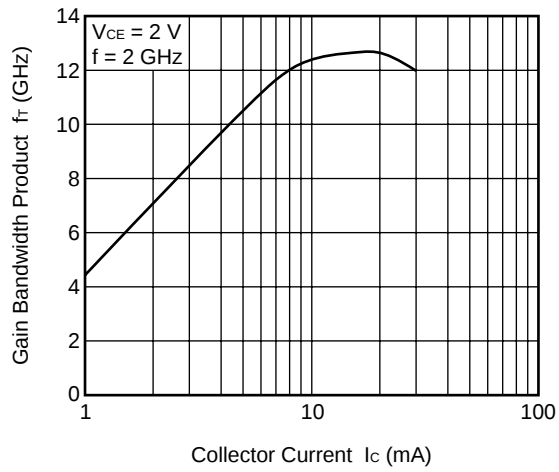




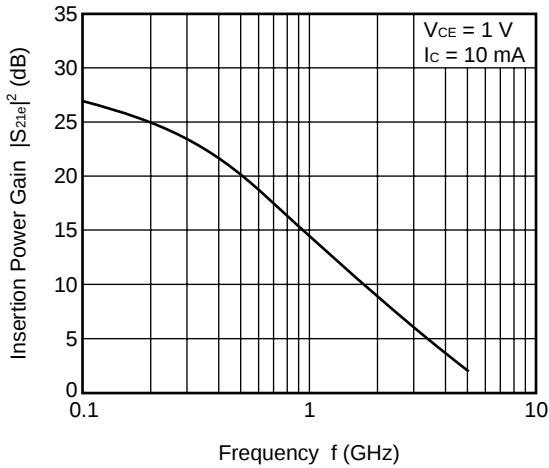
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



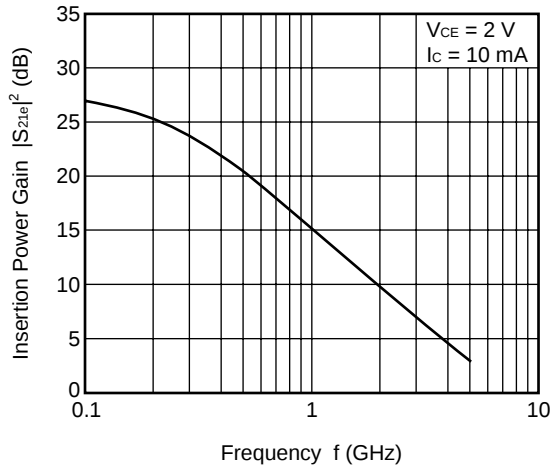
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



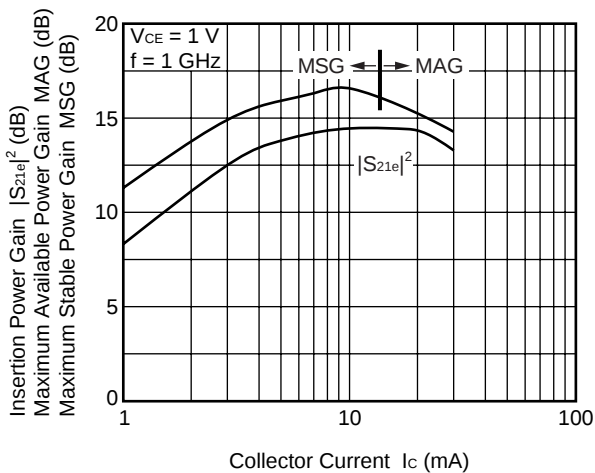
INSERTION POWER GAIN vs. FREQUENCY



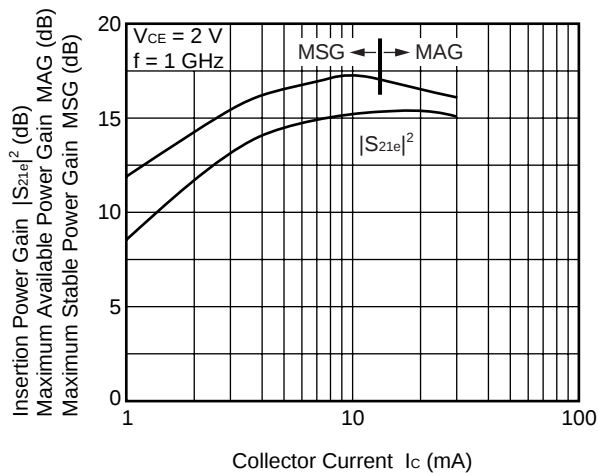
INSERTION POWER GAIN vs. FREQUENCY



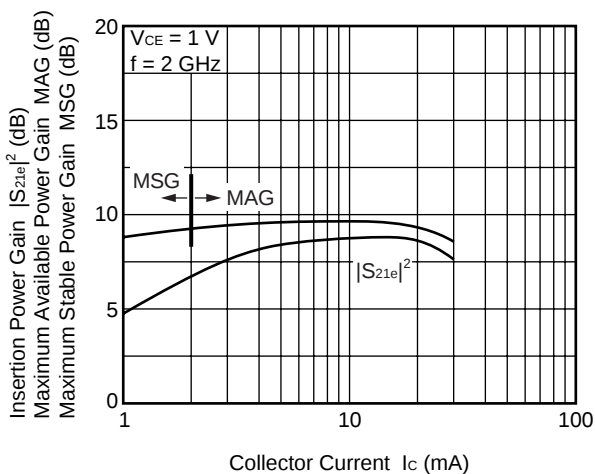
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



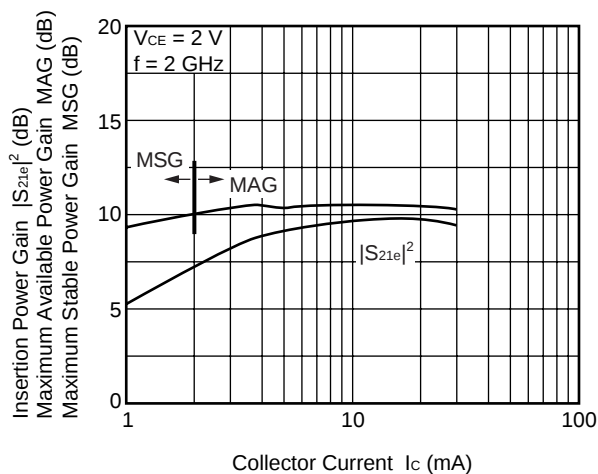
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



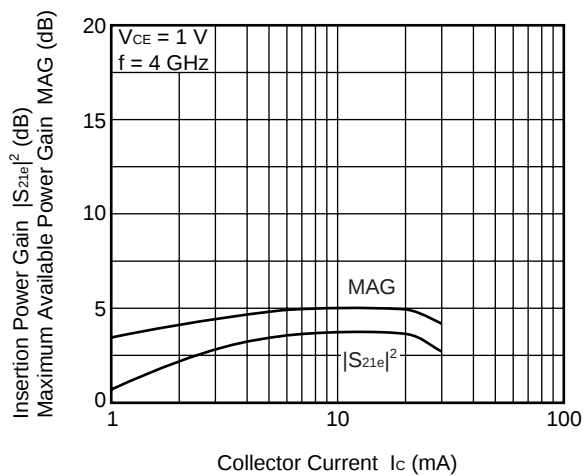
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



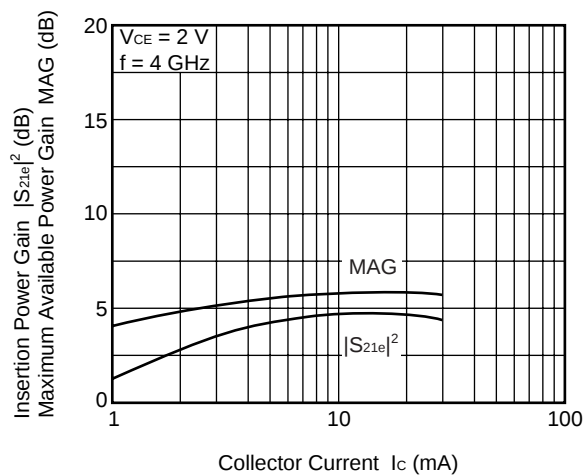
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



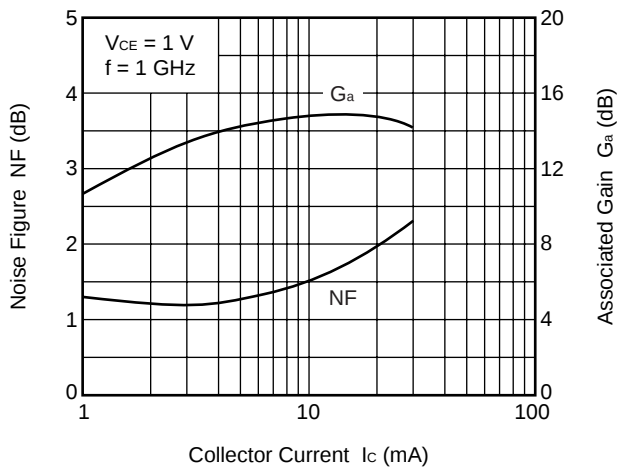
INSERTION POWER GAIN, MAG
vs. COLLECTOR CURRENT



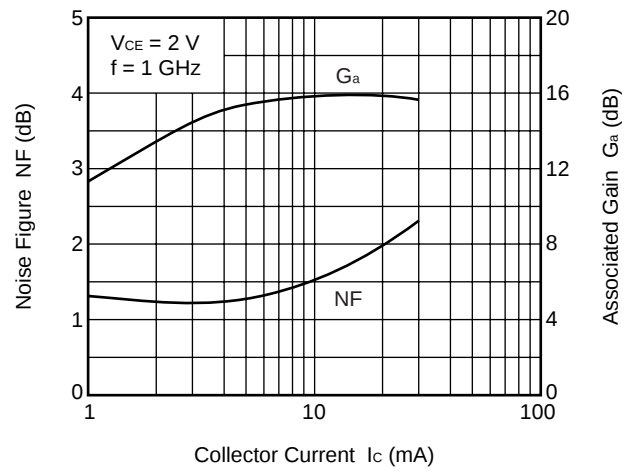
INSERTION POWER GAIN, MAG
vs. COLLECTOR CURRENT



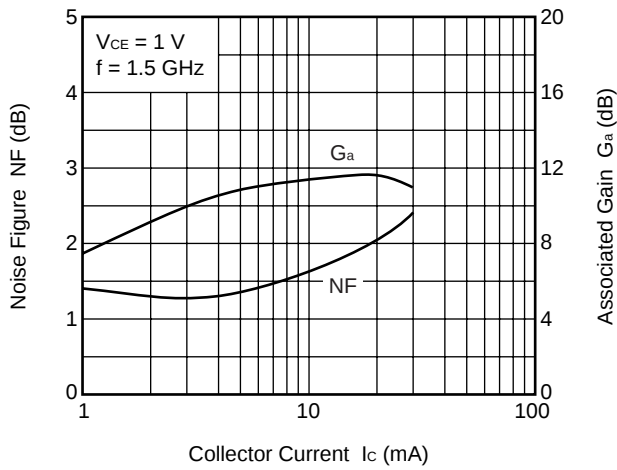
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



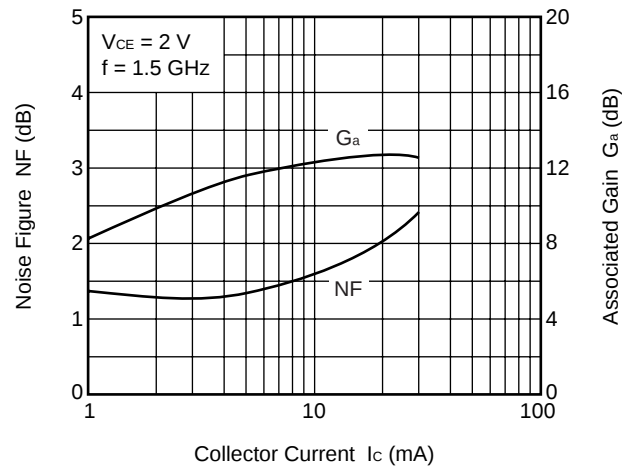
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



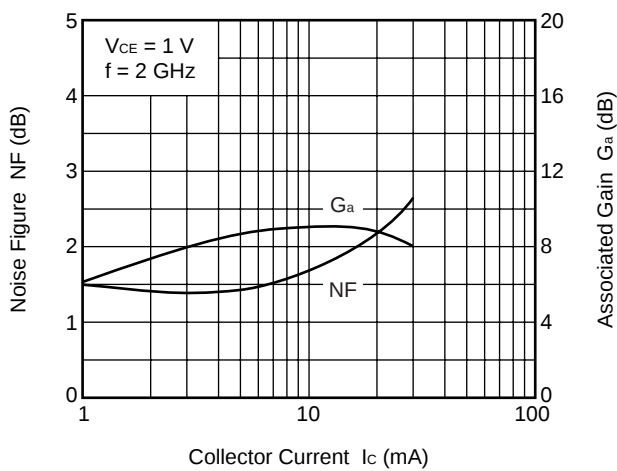
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



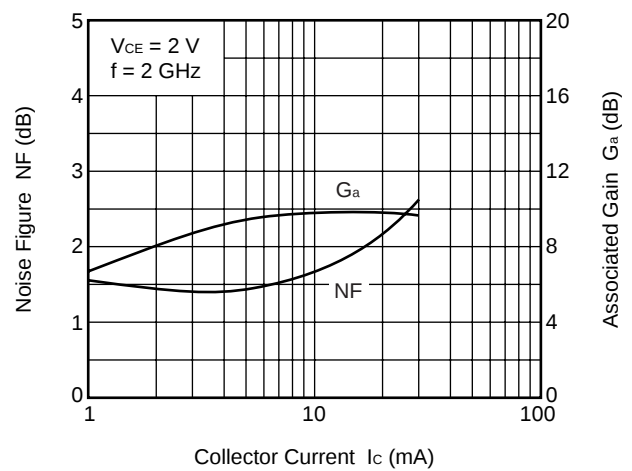
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

S-PARAMETERS

Note When $K \geq 1$, the MAG (Maximum Available Power Gain) is used.
$$\text{MAG} = \left| \frac{S_{21}}{S_{12}} \right| (K - \sqrt{K^2 - 1})$$

When $K < 1$, the MSG (Maximum Stable Power Gain) is used.
$$\text{MSG} = \left| \frac{S_{21}}{S_{12}} \right|$$

$V_{CE} = 1 \text{ V}$, $I_C = 1 \text{ mA}$, $Z_O = 50 \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.957	-7.9	3.570	172.3	0.028	83.0	0.992	-4.9	0.090	21.07
0.2	0.950	-17.3	3.476	164.7	0.055	79.4	0.976	-10.0	0.085	18.02
0.3	0.926	-26.1	3.451	156.8	0.081	73.1	0.962	-15.0	0.145	16.29
0.4	0.895	-34.1	3.317	149.3	0.104	68.5	0.929	-19.5	0.192	15.02
0.5	0.864	-42.3	3.239	142.3	0.126	63.6	0.898	-23.9	0.236	14.11
0.6	0.821	-50.1	3.099	135.5	0.144	59.2	0.857	-28.0	0.285	13.32
0.7	0.781	-57.8	2.980	129.6	0.161	55.3	0.822	-31.5	0.325	12.67
0.8	0.739	-65.2	2.853	123.7	0.174	51.6	0.778	-35.1	0.372	12.15
0.9	0.706	-72.3	2.730	117.9	0.186	48.4	0.747	-38.2	0.410	11.66
1.0	0.668	-79.2	2.605	112.6	0.195	45.6	0.703	-41.2	0.458	11.26
1.1	0.641	-85.9	2.501	107.9	0.204	42.8	0.675	-43.9	0.490	10.89
1.2	0.610	-92.4	2.388	103.4	0.210	40.6	0.637	-46.4	0.536	10.57
1.3	0.585	-98.8	2.299	99.0	0.215	38.2	0.612	-49.0	0.570	10.28
1.4	0.560	-105.0	2.204	94.8	0.219	36.5	0.580	-51.0	0.616	10.02
1.5	0.541	-111.1	2.121	90.5	0.224	34.7	0.558	-53.3	0.650	9.77
1.6	0.519	-116.9	2.035	86.8	0.226	33.3	0.529	-55.4	0.697	9.55
1.7	0.501	-122.9	1.960	83.3	0.228	32.1	0.509	-57.6	0.733	9.34
1.8	0.487	-128.6	1.885	79.7	0.230	31.2	0.484	-59.4	0.778	9.14
1.9	0.474	-134.3	1.820	76.5	0.231	30.1	0.467	-61.8	0.811	8.96
2.0	0.462	-139.7	1.750	72.7	0.232	29.7	0.444	-63.7	0.860	8.78
2.1	0.459	-144.8	1.714	69.9	0.232	29.4	0.430	-66.3	0.878	8.68
2.2	0.453	-149.8	1.656	67.1	0.231	29.2	0.412	-68.2	0.923	8.55
2.3	0.448	-154.7	1.605	64.0	0.231	28.9	0.400	-70.9	0.958	8.43
2.4	0.444	-159.4	1.558	61.5	0.230	29.0	0.383	-72.9	0.999	8.31
2.5	0.445	-163.4	1.515	59.0	0.230	29.0	0.373	-75.7	1.026	7.20
2.6	0.442	-167.6	1.469	56.5	0.229	29.0	0.363	-78.2	1.066	6.51
2.7	0.441	-171.5	1.433	54.2	0.229	29.3	0.354	-81.1	1.097	6.07
2.8	0.441	-175.2	1.389	51.9	0.228	29.8	0.344	-83.1	1.139	5.59
2.9	0.445	-178.4	1.359	49.8	0.229	30.3	0.336	-85.9	1.156	5.34
3.0	0.444	177.9	1.330	47.8	0.230	31.3	0.325	-88.6	1.185	5.02
4.0	0.501	153.6	1.094	30.4	0.279	39.3	0.297	-126.2	1.164	3.48
5.0	0.563	135.7	0.903	16.4	0.356	39.5	0.348	-166.2	1.082	2.29

$V_{CE} = 1\text{ V}$, $I_C = 3\text{ mA}$, $Z_O = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.888	-15.7	9.494	167.0	0.026	81.3	0.965	-10.2	0.091	25.57
0.2	0.832	-30.4	8.899	154.2	0.050	73.3	0.910	-19.8	0.183	22.47
0.3	0.771	-44.3	8.314	142.7	0.071	66.5	0.845	-28.0	0.263	20.69
0.4	0.697	-56.0	7.502	133.3	0.087	61.6	0.764	-34.7	0.348	19.35
0.5	0.634	-66.9	6.836	124.9	0.100	57.5	0.692	-39.9	0.426	18.35
0.6	0.570	-77.1	6.160	117.9	0.110	54.6	0.621	-44.5	0.501	17.48
0.7	0.519	-85.9	5.605	111.9	0.119	52.7	0.565	-47.6	0.569	16.71
0.8	0.475	-94.4	5.113	106.8	0.126	51.2	0.510	-50.7	0.635	16.07
0.9	0.442	-102.3	4.708	101.7	0.134	50.3	0.470	-53.2	0.686	15.45
1.0	0.411	-109.7	4.326	97.4	0.140	49.7	0.427	-55.3	0.746	14.90
1.1	0.392	-116.6	4.025	93.7	0.147	49.1	0.398	-57.4	0.783	14.37
1.2	0.375	-123.8	3.755	90.2	0.153	48.9	0.365	-59.3	0.827	13.90
1.3	0.361	-129.8	3.525	86.8	0.159	48.5	0.342	-61.1	0.862	13.45
1.4	0.349	-136.0	3.313	83.7	0.165	48.5	0.316	-62.6	0.899	13.02
1.5	0.343	-142.4	3.126	80.5	0.172	48.3	0.298	-64.5	0.925	12.61
1.6	0.334	-147.8	2.952	77.8	0.178	48.3	0.275	-66.0	0.959	12.21
1.7	0.330	-153.3	2.809	75.2	0.184	48.3	0.259	-68.2	0.980	11.84
1.8	0.326	-158.9	2.667	72.6	0.190	48.4	0.239	-69.8	1.008	10.94
1.9	0.328	-164.0	2.547	70.3	0.197	48.1	0.226	-72.7	1.020	10.24
2.0	0.328	-168.5	2.432	67.4	0.204	48.2	0.209	-74.7	1.039	9.55
2.1	0.333	-172.6	2.348	65.2	0.210	48.2	0.199	-78.1	1.046	9.17
2.2	0.338	-176.8	2.256	63.2	0.216	48.2	0.185	-80.6	1.060	8.69
2.3	0.341	179.5	2.167	60.8	0.222	47.8	0.176	-84.5	1.072	8.26
2.4	0.345	175.6	2.093	58.8	0.229	47.9	0.164	-87.2	1.080	7.88
2.5	0.349	173.3	2.020	56.8	0.235	47.6	0.157	-91.6	1.089	7.53
2.6	0.356	169.6	1.951	54.8	0.241	47.3	0.148	-94.8	1.096	7.19
2.7	0.359	166.8	1.891	53.0	0.247	47.2	0.142	-99.9	1.104	6.87
2.8	0.366	164.4	1.828	51.3	0.252	47.0	0.134	-103.2	1.113	6.56
2.9	0.371	162.1	1.787	49.4	0.259	46.9	0.131	-108.7	1.111	6.36
3.0	0.371	159.1	1.743	47.8	0.266	47.0	0.123	-113.2	1.119	6.07
4.0	0.445	143.3	1.407	33.0	0.341	42.9	0.150	-169.1	1.069	4.54
5.0	0.519	129.6	1.168	19.9	0.406	37.0	0.241	160.0	1.039	3.38

$V_{CE} = 1 \text{ V}$, $I_C = 5 \text{ mA}$, $Z_0 = 50 \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.806	-20.0	14.186	162.2	0.026	76.8	0.935	-14.4	0.199	27.41
0.2	0.730	-40.1	12.677	146.5	0.047	69.9	0.839	-26.9	0.270	24.35
0.3	0.637	-57.0	11.210	133.4	0.063	63.6	0.737	-36.3	0.383	22.50
0.4	0.554	-70.0	9.635	123.6	0.075	60.4	0.635	-43.1	0.487	21.10
0.5	0.487	-81.7	8.437	115.4	0.085	57.7	0.556	-47.7	0.581	19.97
0.6	0.431	-92.6	7.382	109.1	0.093	56.5	0.484	-51.5	0.664	18.97
0.7	0.392	-101.9	6.570	103.8	0.102	55.9	0.431	-53.9	0.728	18.07
0.8	0.358	-110.8	5.894	99.4	0.110	55.9	0.382	-56.3	0.791	17.30
0.9	0.335	-118.5	5.338	95.0	0.118	55.8	0.348	-58.1	0.836	16.56
1.0	0.317	-126.0	4.878	91.6	0.126	55.9	0.313	-60.0	0.880	15.89
1.1	0.304	-133.0	4.498	88.3	0.133	55.8	0.289	-61.7	0.911	15.28
1.2	0.298	-139.5	4.155	85.2	0.141	55.9	0.261	-63.3	0.943	14.69
1.3	0.293	-145.9	3.885	82.4	0.149	55.8	0.243	-64.9	0.962	14.16
1.4	0.288	-151.4	3.637	79.7	0.157	55.8	0.221	-66.4	0.986	13.65
1.5	0.289	-156.9	3.419	76.9	0.165	55.7	0.207	-68.3	1.000	13.16
1.6	0.286	-162.2	3.221	74.6	0.173	55.5	0.187	-70.0	1.020	11.82
1.7	0.290	-167.1	3.051	72.3	0.181	55.4	0.175	-72.6	1.029	11.22
1.8	0.291	-171.8	2.893	70.0	0.190	55.2	0.158	-74.8	1.043	10.57
1.9	0.295	-175.8	2.758	67.9	0.198	54.6	0.148	-78.7	1.049	10.09
2.0	0.297	179.6	2.628	65.4	0.206	54.5	0.134	-81.5	1.060	9.56
2.1	0.306	176.8	2.531	63.4	0.214	54.2	0.127	-86.7	1.059	9.24
2.2	0.313	173.2	2.427	61.6	0.222	53.8	0.114	-90.5	1.066	8.82
2.3	0.320	170.2	2.323	59.5	0.230	53.2	0.109	-96.6	1.071	8.42
2.4	0.325	167.0	2.244	57.6	0.238	52.9	0.099	-101.5	1.074	8.09
2.5	0.329	164.4	2.163	55.8	0.245	52.3	0.095	-108.4	1.080	7.74
2.6	0.339	161.9	2.087	54.0	0.252	51.7	0.088	-114.2	1.082	7.43
2.7	0.345	159.6	2.017	52.4	0.259	51.3	0.087	-122.5	1.085	7.13
2.8	0.350	157.0	1.953	50.8	0.266	50.8	0.082	-128.6	1.091	6.82
2.9	0.356	155.4	1.906	48.9	0.273	50.5	0.085	-136.8	1.087	6.63
3.0	0.357	152.4	1.862	47.8	0.281	50.2	0.081	-144.5	1.090	6.38
4.0	0.436	140.2	1.494	33.8	0.359	43.5	0.151	165.4	1.050	4.83
5.0	0.511	127.3	1.237	21.4	0.421	36.5	0.248	145.4	1.031	3.61

$V_{CE} = 1\text{ V}$, $I_C = 7\text{ mA}$, $Z_0 = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.742	-25.1	17.883	158.5	0.025	74.6	0.904	-17.8	0.242	28.62
0.2	0.650	-48.2	15.271	140.7	0.043	67.3	0.777	-32.0	0.345	25.50
0.3	0.545	-66.7	12.912	127.1	0.057	63.2	0.655	-41.6	0.471	23.53
0.4	0.462	-80.3	10.748	117.6	0.068	61.0	0.548	-47.9	0.590	22.02
0.5	0.403	-92.3	9.225	110.1	0.077	59.6	0.470	-51.9	0.683	20.79
0.6	0.358	-103.4	7.955	104.2	0.086	59.4	0.403	-55.1	0.763	19.67
0.7	0.324	-113.1	7.001	99.5	0.095	59.4	0.356	-56.9	0.822	18.69
0.8	0.300	-122.1	6.234	95.5	0.103	59.8	0.313	-58.9	0.875	17.83
0.9	0.285	-129.7	5.622	91.6	0.112	59.9	0.283	-60.4	0.910	17.01
1.0	0.273	-137.4	5.103	88.5	0.121	60.0	0.252	-62.0	0.945	16.27
1.1	0.269	-143.7	4.702	85.5	0.129	60.0	0.232	-63.5	0.964	15.61
1.2	0.268	-150.0	4.332	82.7	0.138	60.0	0.208	-65.2	0.986	14.97
1.3	0.266	-155.2	4.031	80.1	0.146	59.8	0.193	-66.9	1.002	14.16
1.4	0.264	-161.0	3.779	77.6	0.156	59.7	0.173	-68.5	1.016	13.07
1.5	0.267	-165.7	3.540	75.1	0.164	59.4	0.162	-70.5	1.025	12.35
1.6	0.269	-170.5	3.332	72.9	0.173	59.1	0.144	-72.7	1.038	11.65
1.7	0.274	-174.5	3.155	70.9	0.182	58.8	0.134	-75.8	1.043	11.11
1.8	0.278	-179.1	2.988	68.7	0.191	58.4	0.118	-78.8	1.052	10.54
1.9	0.287	177.2	2.845	66.7	0.200	57.7	0.110	-83.9	1.053	10.11
2.0	0.289	173.1	2.714	64.5	0.209	57.2	0.097	-88.2	1.060	9.63
2.1	0.297	170.7	2.608	62.5	0.218	56.8	0.092	-95.0	1.060	9.29
2.2	0.305	168.1	2.498	60.8	0.226	56.2	0.082	-100.8	1.064	8.89
2.3	0.314	165.1	2.391	58.8	0.234	55.5	0.080	-109.5	1.067	8.51
2.4	0.319	162.2	2.306	57.0	0.243	55.0	0.072	-117.3	1.068	8.17
2.5	0.327	160.6	2.221	55.2	0.251	54.3	0.072	-126.6	1.070	7.85
2.6	0.332	157.6	2.143	53.6	0.259	53.5	0.068	-134.9	1.074	7.52
2.7	0.340	155.9	2.077	52.0	0.266	53.0	0.071	-144.6	1.074	7.26
2.8	0.347	153.5	2.005	50.5	0.273	52.3	0.070	-152.9	1.079	6.95
2.9	0.354	151.8	1.956	48.6	0.281	51.9	0.077	-160.2	1.075	6.76
3.0	0.357	149.3	1.914	47.5	0.289	51.6	0.077	-168.7	1.075	6.55
4.0	0.433	138.2	1.529	34.0	0.368	43.7	0.163	154.4	1.042	4.93
5.0	0.509	126.5	1.266	21.9	0.428	36.2	0.260	138.8	1.027	3.71

$V_{CE} = 1\text{ V}$, $I_C = 10\text{ mA}$, $Z_O = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.667	-31.1	22.012	154.1	0.024	76.4	0.861	-21.8	0.267	29.60
0.2	0.551	-58.0	17.768	134.6	0.040	67.2	0.701	-37.4	0.427	26.53
0.3	0.450	-77.1	14.329	121.0	0.052	63.2	0.566	-46.6	0.580	24.43
0.4	0.374	-92.1	11.610	112.1	0.062	62.9	0.461	-52.2	0.700	22.75
0.5	0.325	-104.8	9.783	105.2	0.071	62.6	0.389	-55.2	0.787	21.39
0.6	0.294	-115.9	8.347	100.0	0.080	63.0	0.330	-57.8	0.855	20.19
0.7	0.275	-126.0	7.292	95.8	0.089	63.3	0.289	-59.0	0.899	19.11
0.8	0.258	-134.9	6.459	92.3	0.098	63.7	0.252	-60.7	0.941	18.18
0.9	0.252	-142.2	5.804	88.7	0.108	63.9	0.228	-61.8	0.963	17.29
1.0	0.246	-149.3	5.258	85.9	0.118	64.1	0.201	-63.5	0.989	16.51
1.1	0.245	-154.9	4.830	83.1	0.127	63.8	0.184	-64.9	1.002	15.53
1.2	0.248	-160.6	4.447	80.8	0.136	63.6	0.163	-66.7	1.017	14.34
1.3	0.250	-165.1	4.128	78.2	0.146	63.2	0.151	-68.5	1.025	13.55
1.4	0.252	-169.6	3.864	75.8	0.156	62.9	0.133	-70.3	1.034	12.82
1.5	0.257	-173.6	3.614	73.5	0.165	62.4	0.124	-73.0	1.040	12.18
1.6	0.260	-178.3	3.397	71.5	0.175	62.0	0.108	-75.7	1.049	11.54
1.7	0.267	178.0	3.218	69.5	0.184	61.5	0.099	-80.1	1.050	11.06
1.8	0.274	174.1	3.045	67.5	0.194	60.8	0.085	-84.3	1.055	10.53
1.9	0.279	171.3	2.901	65.6	0.203	60.0	0.079	-91.6	1.057	10.09
2.0	0.289	167.7	2.760	63.5	0.213	59.4	0.068	-98.3	1.058	9.65
2.1	0.297	166.0	2.655	61.6	0.222	58.8	0.066	-108.2	1.057	9.33
2.2	0.304	163.1	2.541	60.0	0.230	58.0	0.059	-117.8	1.060	8.93
2.3	0.312	161.0	2.429	58.0	0.239	57.2	0.060	-128.7	1.063	8.54
2.4	0.318	158.3	2.345	56.4	0.248	56.5	0.057	-140.4	1.063	8.22
2.5	0.328	156.8	2.257	54.6	0.255	55.8	0.061	-150.4	1.064	7.91
2.6	0.333	154.2	2.178	53.0	0.264	54.9	0.061	-160.2	1.066	7.60
2.7	0.342	152.5	2.107	51.6	0.272	54.2	0.068	-168.6	1.066	7.32
2.8	0.350	150.3	2.033	50.0	0.279	53.5	0.071	-176.2	1.069	7.02
2.9	0.355	149.0	1.988	48.3	0.287	52.9	0.081	179.2	1.065	6.84
3.0	0.358	146.7	1.942	47.2	0.295	52.5	0.084	172.1	1.065	6.62
4.0	0.435	136.6	1.552	34.0	0.374	43.9	0.178	146.7	1.036	5.02
5.0	0.511	125.5	1.282	22.3	0.434	36.0	0.273	134.1	1.023	3.79

$V_{CE} = 1\text{ V}$, $I_C = 20\text{ mA}$, $Z_O = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.469	-48.0	28.685	145.1	0.022	73.5	0.748	-29.5	0.433	31.22
0.2	0.367	-81.6	20.587	123.8	0.033	67.9	0.545	-45.8	0.635	27.93
0.3	0.309	-105.5	15.474	111.4	0.044	67.1	0.414	-53.0	0.776	25.51
0.4	0.271	-120.9	12.109	104.0	0.054	68.4	0.327	-56.6	0.873	23.51
0.5	0.249	-133.2	9.981	98.2	0.064	68.7	0.271	-57.7	0.931	21.92
0.6	0.243	-143.9	8.417	94.1	0.074	69.3	0.227	-59.1	0.972	20.55
0.7	0.241	-152.5	7.287	90.5	0.085	69.5	0.198	-59.2	0.995	19.35
0.8	0.239	-160.2	6.430	87.5	0.095	69.7	0.171	-60.4	1.017	17.52
0.9	0.243	-165.0	5.758	84.5	0.105	69.4	0.153	-61.0	1.026	16.39
1.0	0.247	-170.3	5.198	82.0	0.116	69.1	0.133	-62.6	1.037	15.34
1.1	0.250	-173.7	4.761	79.5	0.126	68.6	0.121	-64.0	1.043	14.51
1.2	0.255	-177.7	4.375	77.3	0.136	68.0	0.104	-66.2	1.050	13.69
1.3	0.260	179.1	4.057	75.1	0.147	67.4	0.096	-68.5	1.053	13.02
1.4	0.267	175.6	3.798	72.9	0.157	66.8	0.081	-71.3	1.055	12.41
1.5	0.274	172.7	3.553	70.8	0.167	66.0	0.074	-74.9	1.055	11.84
1.6	0.279	169.9	3.338	68.8	0.177	65.3	0.061	-80.0	1.060	11.25
1.7	0.287	167.3	3.159	67.0	0.187	64.5	0.055	-87.2	1.059	10.79
1.8	0.294	164.5	2.988	65.2	0.197	63.8	0.044	-96.9	1.061	10.29
1.9	0.304	161.9	2.840	63.4	0.207	62.7	0.042	-110.9	1.060	9.87
2.0	0.311	159.1	2.707	61.3	0.217	61.8	0.037	-127.8	1.061	9.44
2.1	0.318	157.9	2.602	59.6	0.227	61.1	0.041	-142.2	1.059	9.12
2.2	0.328	155.7	2.490	58.0	0.236	60.1	0.041	-158.6	1.060	8.75
2.3	0.335	154.4	2.379	56.0	0.245	59.2	0.049	-167.2	1.062	8.36
2.4	0.346	152.2	2.295	54.5	0.254	58.4	0.053	-179.0	1.059	8.08
2.5	0.350	150.9	2.208	52.8	0.262	57.4	0.062	175.6	1.062	7.73
2.6	0.357	148.8	2.131	51.3	0.271	56.4	0.067	168.1	1.062	7.43
2.7	0.366	147.6	2.058	49.8	0.279	55.6	0.078	164.7	1.062	7.15
2.8	0.372	145.9	1.988	48.5	0.286	54.8	0.084	159.5	1.065	6.86
2.9	0.382	145.0	1.942	46.6	0.294	54.2	0.095	158.9	1.059	6.70
3.0	0.384	142.5	1.903	45.5	0.302	53.6	0.101	153.8	1.058	6.52
4.0	0.459	133.7	1.520	32.8	0.382	44.2	0.197	139.1	1.030	4.92
5.0	0.534	123.3	1.247	21.4	0.440	36.0	0.290	129.3	1.020	3.65

$V_{CE} = 2\text{ V}$, $I_C = 1\text{ mA}$, $Z_O = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.969	-7.6	3.484	172.7	0.024	85.6	0.994	-4.1	0.046	21.54
0.2	0.955	-15.7	3.403	165.9	0.047	80.0	0.981	-8.6	0.088	18.56
0.3	0.936	-23.6	3.395	158.5	0.071	74.9	0.970	-12.8	0.139	16.82
0.4	0.904	-31.1	3.273	151.7	0.091	70.6	0.941	-16.8	0.183	15.55
0.5	0.880	-38.5	3.217	145.1	0.110	65.9	0.918	-20.7	0.226	14.64
0.6	0.840	-45.8	3.097	138.7	0.127	61.9	0.881	-24.4	0.270	13.86
0.7	0.806	-52.7	2.987	132.8	0.143	58.1	0.854	-27.5	0.311	13.20
0.8	0.764	-59.6	2.874	127.2	0.155	54.5	0.812	-30.7	0.360	12.68
0.9	0.730	-66.4	2.770	121.6	0.167	51.6	0.786	-33.6	0.392	12.19
1.0	0.690	-73.1	2.652	116.5	0.175	48.8	0.744	-36.3	0.441	11.80
1.1	0.663	-79.4	2.554	111.8	0.185	46.1	0.719	-38.9	0.472	11.41
1.2	0.632	-85.6	2.450	107.4	0.190	43.9	0.683	-41.0	0.518	11.10
1.3	0.605	-92.0	2.369	103.1	0.196	41.6	0.660	-43.5	0.547	10.82
1.4	0.578	-97.8	2.276	98.9	0.201	39.8	0.629	-45.3	0.594	10.54
1.5	0.556	-103.5	2.199	94.7	0.205	38.0	0.608	-47.4	0.628	10.30
1.6	0.531	-109.3	2.109	91.0	0.208	36.6	0.580	-49.2	0.678	10.07
1.7	0.511	-115.1	2.041	87.4	0.211	35.5	0.560	-51.2	0.712	9.87
1.8	0.492	-120.9	1.965	83.8	0.212	34.6	0.536	-52.7	0.758	9.67
1.9	0.475	-126.6	1.900	80.7	0.214	33.6	0.519	-55.0	0.791	9.49
2.0	0.464	-131.9	1.831	76.9	0.215	33.1	0.497	-56.6	0.838	9.31
2.1	0.458	-137.2	1.794	73.9	0.215	32.9	0.483	-58.8	0.858	9.20
2.2	0.450	-142.3	1.736	71.2	0.214	32.6	0.463	-60.5	0.905	9.09
2.3	0.440	-147.4	1.684	68.1	0.215	32.4	0.452	-62.8	0.939	8.95
2.4	0.435	-152.3	1.640	65.6	0.214	32.4	0.435	-64.5	0.977	8.84
2.5	0.434	-156.4	1.593	63.0	0.214	32.5	0.424	-66.8	1.008	8.18
2.6	0.430	-160.7	1.548	60.4	0.213	32.5	0.414	-69.1	1.047	7.28
2.7	0.427	-164.9	1.508	58.0	0.213	33.0	0.403	-71.5	1.080	6.77
2.8	0.427	-168.8	1.463	55.9	0.212	33.6	0.393	-73.1	1.121	6.27
2.9	0.430	-172.3	1.432	53.7	0.214	34.1	0.383	-75.5	1.141	5.99
3.0	0.425	-176.1	1.399	51.8	0.215	35.3	0.371	-77.8	1.177	5.59
4.0	0.479	157.8	1.152	33.9	0.267	44.1	0.326	-111.1	1.140	4.08
5.0	0.544	138.4	0.958	19.1	0.351	44.3	0.348	-151.9	1.045	3.07

$V_{CE} = 2 \text{ V}$, $I_C = 3 \text{ mA}$, $Z_0 = 50 \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.886	-13.0	9.561	167.8	0.023	82.4	0.970	-8.7	0.110	26.18
0.2	0.850	-27.0	9.010	156.0	0.044	74.5	0.924	-17.1	0.187	23.12
0.3	0.789	-39.7	8.496	145.2	0.062	68.8	0.868	-24.3	0.257	21.34
0.4	0.715	-50.2	7.742	136.0	0.077	64.1	0.795	-30.1	0.347	20.02
0.5	0.655	-60.3	7.130	127.9	0.089	60.1	0.731	-34.7	0.420	19.02
0.6	0.588	-69.2	6.475	120.8	0.099	57.4	0.662	-38.7	0.499	18.14
0.7	0.537	-77.5	5.929	114.9	0.109	55.4	0.611	-41.6	0.559	17.37
0.8	0.488	-85.3	5.417	109.8	0.115	54.1	0.558	-44.1	0.625	16.73
0.9	0.450	-92.6	5.005	104.7	0.123	53.2	0.519	-46.2	0.677	16.10
1.0	0.415	-99.7	4.623	100.7	0.129	52.6	0.477	-48.1	0.733	15.56
1.1	0.391	-106.3	4.309	96.8	0.135	51.9	0.448	-49.6	0.773	15.03
1.2	0.369	-112.9	4.023	93.3	0.141	51.8	0.414	-50.9	0.819	14.56
1.3	0.352	-119.1	3.783	90.0	0.147	51.3	0.393	-52.4	0.850	14.10
1.4	0.337	-125.3	3.559	86.8	0.153	51.3	0.367	-53.4	0.886	13.66
1.5	0.325	-131.6	3.364	83.7	0.159	51.1	0.349	-54.7	0.912	13.25
1.6	0.313	-137.0	3.177	80.9	0.165	51.2	0.326	-55.6	0.947	12.84
1.7	0.307	-142.9	3.028	78.2	0.171	51.3	0.311	-57.2	0.966	12.47
1.8	0.301	-148.8	2.877	75.7	0.178	51.3	0.291	-58.1	0.991	12.09
1.9	0.300	-154.0	2.753	73.3	0.184	51.1	0.277	-60.1	1.004	11.35
2.0	0.294	-159.6	2.624	70.6	0.191	51.1	0.260	-61.3	1.029	10.35
2.1	0.298	-163.6	2.541	68.2	0.197	51.3	0.249	-63.7	1.033	10.00
2.2	0.302	-168.5	2.439	66.3	0.202	51.3	0.233	-65.0	1.048	9.47
2.3	0.304	-172.5	2.345	64.0	0.209	50.9	0.224	-67.8	1.058	9.04
2.4	0.306	-176.6	2.265	62.1	0.215	51.0	0.211	-69.2	1.067	8.64
2.5	0.310	-179.8	2.184	60.0	0.221	50.7	0.201	-72.3	1.077	8.26
2.6	0.313	176.2	2.110	58.1	0.227	50.5	0.191	-74.1	1.087	7.89
2.7	0.319	173.2	2.048	56.2	0.233	50.4	0.183	-77.4	1.090	7.60
2.8	0.324	170.1	1.982	54.6	0.238	50.2	0.174	-79.1	1.100	7.27
2.9	0.329	167.6	1.933	52.6	0.245	50.1	0.166	-82.8	1.100	7.04
3.0	0.327	164.5	1.887	51.2	0.252	50.2	0.155	-85.2	1.107	6.75
4.0	0.403	147.4	1.524	36.0	0.328	46.5	0.132	-138.6	1.059	5.19
5.0	0.483	133.1	1.267	22.5	0.397	40.6	0.198	176.2	1.022	4.12

$V_{CE} = 2\text{ V}$, $I_C = 5\text{ mA}$, $Z_0 = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.810	-17.9	14.326	163.6	0.023	77.6	0.946	-12.2	0.201	28.00
0.2	0.753	-35.6	12.962	148.7	0.041	71.9	0.863	-23.1	0.265	25.01
0.3	0.665	-50.2	11.607	136.2	0.056	66.0	0.773	-31.2	0.377	23.16
0.4	0.578	-62.0	10.089	126.5	0.067	62.8	0.679	-37.2	0.480	21.76
0.5	0.507	-72.7	8.944	118.5	0.077	60.2	0.602	-41.2	0.570	20.64
0.6	0.444	-81.9	7.870	112.1	0.086	59.1	0.533	-44.5	0.654	19.63
0.7	0.399	-90.3	7.038	106.7	0.094	58.5	0.483	-46.2	0.717	18.75
0.8	0.359	-98.5	6.328	102.1	0.101	58.3	0.434	-47.9	0.780	17.97
0.9	0.331	-106.1	5.759	97.8	0.109	58.2	0.401	-49.2	0.822	17.24
1.0	0.304	-113.0	5.256	94.3	0.116	58.3	0.365	-50.3	0.871	16.57
1.1	0.290	-119.6	4.850	91.0	0.123	58.3	0.342	-51.3	0.899	15.94
1.2	0.277	-126.5	4.507	88.0	0.131	58.4	0.314	-52.2	0.929	15.37
1.3	0.267	-132.4	4.205	85.2	0.138	58.3	0.297	-53.2	0.951	14.83
1.4	0.259	-138.9	3.943	82.4	0.146	58.3	0.275	-53.7	0.974	14.32
1.5	0.254	-144.9	3.707	79.7	0.154	58.0	0.261	-54.9	0.989	13.82
1.6	0.250	-150.7	3.496	77.4	0.161	58.0	0.241	-55.5	1.008	12.82
1.7	0.248	-156.1	3.316	75.0	0.169	57.9	0.229	-57.1	1.018	12.10
1.8	0.248	-161.6	3.144	72.9	0.177	57.7	0.211	-57.8	1.032	11.40
1.9	0.251	-166.5	2.998	70.8	0.185	57.3	0.200	-60.1	1.038	10.90
2.0	0.251	-171.6	2.860	68.4	0.193	57.0	0.185	-61.2	1.049	10.35
2.1	0.258	-174.5	2.756	66.4	0.201	56.9	0.175	-64.2	1.049	10.02
2.2	0.266	-178.8	2.643	64.6	0.208	56.5	0.162	-65.6	1.054	9.61
2.3	0.271	177.6	2.533	62.5	0.216	56.0	0.154	-69.0	1.060	9.20
2.4	0.276	174.2	2.446	60.8	0.224	55.7	0.142	-70.8	1.063	8.85
2.5	0.281	171.3	2.357	58.9	0.231	55.2	0.134	-74.7	1.068	8.50
2.6	0.286	168.2	2.277	57.2	0.238	54.6	0.124	-76.8	1.072	8.17
2.7	0.293	165.3	2.202	55.5	0.245	54.2	0.117	-81.8	1.075	7.87
2.8	0.300	162.6	2.128	54.0	0.251	53.7	0.108	-84.1	1.080	7.55
2.9	0.307	160.8	2.075	52.3	0.259	53.3	0.102	-90.2	1.077	7.34
3.0	0.309	157.5	2.030	50.9	0.267	53.2	0.092	-93.7	1.078	7.12
4.0	0.387	144.1	1.629	36.8	0.345	46.9	0.103	-167.2	1.041	5.50
5.0	0.470	131.2	1.351	23.9	0.411	39.8	0.192	157.5	1.017	4.37

$V_{CE} = 2\text{ V}$, $I_C = 7\text{ mA}$, $Z_0 = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.757	-21.8	18.127	160.1	0.022	76.5	0.920	-15.1	0.241	29.10
0.2	0.672	-41.9	15.731	143.3	0.038	70.8	0.809	-27.4	0.331	26.19
0.3	0.571	-58.2	13.538	130.0	0.051	65.7	0.698	-35.7	0.462	24.22
0.4	0.483	-70.1	11.406	120.6	0.061	63.4	0.596	-41.0	0.580	22.69
0.5	0.414	-81.3	9.869	112.9	0.070	62.1	0.521	-44.2	0.672	21.47
0.6	0.361	-90.7	8.564	107.0	0.079	61.9	0.455	-46.6	0.752	20.37
0.7	0.322	-99.0	7.558	102.2	0.087	61.6	0.410	-47.6	0.811	19.39
0.8	0.289	-107.4	6.752	98.1	0.095	61.9	0.366	-48.9	0.864	18.53
0.9	0.268	-115.0	6.109	94.3	0.103	62.2	0.338	-49.6	0.897	17.73
1.0	0.247	-122.6	5.553	91.1	0.111	62.3	0.307	-50.4	0.935	16.99
1.1	0.240	-129.0	5.105	88.0	0.120	62.2	0.287	-51.0	0.954	16.30
1.2	0.232	-135.8	4.716	85.4	0.128	62.3	0.263	-51.6	0.977	15.67
1.3	0.227	-142.1	4.396	82.8	0.136	62.0	0.248	-52.5	0.990	15.09
1.4	0.223	-147.8	4.110	80.3	0.144	62.0	0.229	-52.8	1.006	14.05
1.5	0.222	-153.2	3.865	77.8	0.153	61.7	0.217	-53.9	1.014	13.29
1.6	0.220	-159.1	3.635	75.7	0.161	61.5	0.199	-54.4	1.029	12.49
1.7	0.225	-164.9	3.446	73.5	0.170	61.3	0.188	-56.0	1.032	11.97
1.8	0.226	-169.6	3.270	71.5	0.179	60.8	0.172	-56.6	1.041	11.38
1.9	0.232	-174.0	3.111	69.6	0.187	60.2	0.163	-59.2	1.044	10.92
2.0	0.236	-178.9	2.966	67.3	0.196	59.8	0.149	-60.2	1.050	10.43
2.1	0.244	179.2	2.859	65.3	0.204	59.4	0.140	-63.9	1.048	10.12
2.2	0.251	175.1	2.736	63.8	0.212	58.8	0.127	-65.3	1.053	9.70
2.3	0.256	171.7	2.621	61.7	0.220	58.1	0.120	-69.6	1.058	9.29
2.4	0.265	168.4	2.530	60.0	0.228	57.8	0.108	-71.6	1.057	8.98
2.5	0.271	166.5	2.435	58.2	0.236	57.0	0.101	-76.6	1.061	8.63
2.6	0.277	163.8	2.347	56.7	0.244	56.4	0.092	-79.2	1.063	8.30
2.7	0.284	161.3	2.272	55.1	0.251	55.8	0.085	-85.9	1.066	8.00
2.8	0.290	158.7	2.194	53.7	0.258	55.2	0.077	-89.4	1.070	7.68
2.9	0.298	157.0	2.143	52.0	0.266	54.7	0.072	-97.8	1.066	7.49
3.0	0.300	153.9	2.095	50.7	0.274	54.4	0.064	-103.6	1.066	7.27
4.0	0.381	142.5	1.679	37.1	0.353	47.1	0.102	175.1	1.033	5.66
5.0	0.465	130.2	1.389	24.7	0.417	39.5	0.198	148.8	1.015	4.47

$V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$, $Z_O = 50\ \Omega$

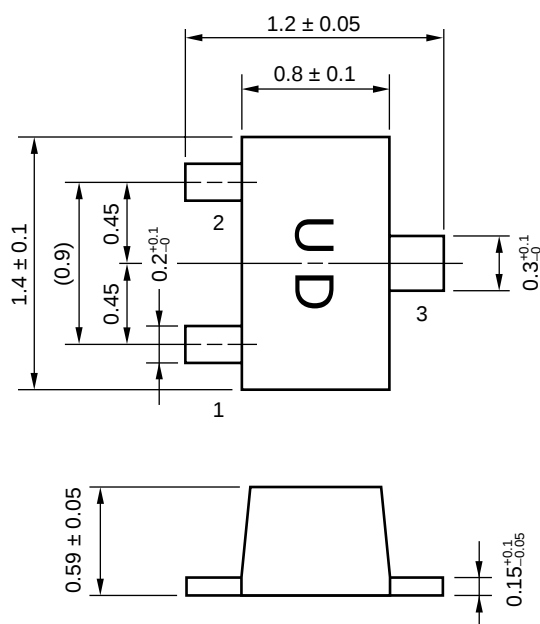
Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.683	-26.0	22.452	156.0	0.020	75.6	0.885	-18.3	0.291	30.48
0.2	0.576	-49.8	18.533	137.3	0.035	69.7	0.742	-31.7	0.421	27.21
0.3	0.470	-66.8	15.236	123.9	0.047	66.4	0.616	-39.5	0.565	25.12
0.4	0.386	-79.1	12.483	114.9	0.056	65.3	0.515	-43.9	0.688	23.47
0.5	0.329	-89.9	10.590	107.9	0.065	64.7	0.445	-46.0	0.773	22.14
0.6	0.285	-100.1	9.077	102.5	0.073	65.1	0.386	-47.5	0.842	20.93
0.7	0.257	-109.1	7.954	98.2	0.082	65.4	0.346	-47.8	0.886	19.85
0.8	0.232	-117.7	7.056	94.6	0.091	65.7	0.309	-48.4	0.928	18.91
0.9	0.219	-125.4	6.356	91.1	0.100	65.8	0.286	-48.7	0.951	18.04
1.0	0.207	-133.3	5.768	88.3	0.109	66.0	0.259	-49.1	0.977	17.25
1.1	0.203	-139.4	5.292	85.6	0.117	65.8	0.243	-49.5	0.990	16.54
1.2	0.203	-146.4	4.869	83.2	0.126	65.7	0.222	-49.8	1.005	15.41
1.3	0.199	-151.6	4.532	80.6	0.135	65.4	0.210	-50.5	1.015	14.50
1.4	0.198	-157.7	4.244	78.5	0.144	65.0	0.193	-50.7	1.023	13.75
1.5	0.201	-162.3	3.976	76.1	0.153	64.5	0.183	-51.8	1.028	13.10
1.6	0.203	-167.7	3.737	74.1	0.162	64.2	0.167	-52.1	1.038	12.43
1.7	0.208	-172.3	3.536	72.2	0.172	63.8	0.157	-53.8	1.040	11.92
1.8	0.214	-177.1	3.352	70.3	0.180	63.2	0.142	-54.3	1.045	11.39
1.9	0.222	179.5	3.192	68.5	0.190	62.5	0.133	-57.3	1.044	10.97
2.0	0.225	174.9	3.042	66.3	0.199	61.8	0.120	-58.3	1.050	10.48
2.1	0.234	172.7	2.925	64.5	0.207	61.5	0.112	-62.4	1.048	10.16
2.2	0.242	170.1	2.800	62.9	0.216	60.6	0.100	-63.9	1.051	9.76
2.3	0.250	166.9	2.682	61.0	0.224	59.8	0.093	-69.3	1.052	9.38
2.4	0.258	164.5	2.585	59.4	0.233	59.3	0.082	-71.7	1.052	9.06
2.5	0.265	162.2	2.492	57.8	0.240	58.5	0.075	-78.4	1.055	8.73
2.6	0.271	159.6	2.400	56.2	0.249	57.7	0.066	-81.9	1.056	8.39
2.7	0.279	157.8	2.323	54.8	0.256	57.0	0.060	-91.2	1.057	8.11
2.8	0.286	155.3	2.242	53.3	0.263	56.3	0.053	-96.5	1.061	7.79
2.9	0.295	154.0	2.189	51.6	0.271	55.8	0.051	-109.6	1.057	7.61
3.0	0.298	150.8	2.138	50.4	0.279	55.3	0.044	-119.0	1.057	7.39
4.0	0.378	141.0	1.712	37.1	0.360	47.3	0.108	162.5	1.027	5.76
5.0	0.464	129.5	1.414	25.0	0.423	39.4	0.206	142.6	1.012	4.57

$V_{CE} = 2 \text{ V}$, $I_C = 20 \text{ mA}$, $Z_O = 50 \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.508	-39.4	30.251	147.7	0.017	76.1	0.802	-24.4	0.392	32.49
0.2	0.382	-66.8	22.343	126.9	0.030	69.8	0.611	-37.7	0.614	28.78
0.3	0.303	-86.7	17.127	114.3	0.040	69.0	0.482	-43.0	0.753	26.34
0.4	0.252	-100.6	13.489	106.7	0.049	70.1	0.395	-44.8	0.851	24.41
0.5	0.215	-112.7	11.165	100.8	0.058	70.8	0.341	-44.5	0.911	22.84
0.6	0.196	-123.7	9.428	96.5	0.068	71.4	0.297	-44.3	0.953	21.44
0.7	0.185	-132.6	8.180	92.8	0.077	71.5	0.270	-43.4	0.977	20.25
0.8	0.178	-142.9	7.227	89.9	0.087	71.5	0.243	-42.9	0.999	19.22
0.9	0.176	-149.4	6.478	87.0	0.096	71.3	0.227	-42.5	1.009	17.69
1.0	0.174	-156.9	5.859	84.5	0.106	71.1	0.207	-42.4	1.023	16.51
1.1	0.178	-161.1	5.357	82.1	0.115	70.6	0.196	-42.4	1.027	15.65
1.2	0.182	-166.3	4.932	79.9	0.125	70.1	0.179	-42.4	1.035	14.82
1.3	0.185	-170.3	4.584	77.8	0.134	69.6	0.171	-42.9	1.037	14.14
1.4	0.191	-175.2	4.276	75.7	0.144	69.1	0.157	-42.6	1.041	13.49
1.5	0.196	-178.2	3.997	73.6	0.153	68.3	0.150	-43.7	1.044	12.88
1.6	0.201	178.3	3.765	71.8	0.163	67.6	0.136	-43.5	1.047	12.31
1.7	0.209	174.3	3.565	70.0	0.173	67.1	0.128	-45.2	1.046	11.84
1.8	0.218	171.1	3.378	68.2	0.182	66.3	0.115	-45.1	1.047	11.36
1.9	0.223	168.5	3.215	66.5	0.192	65.4	0.106	-48.4	1.047	10.92
2.0	0.230	164.6	3.061	64.4	0.201	64.6	0.094	-48.8	1.049	10.47
2.1	0.242	163.8	2.942	62.8	0.210	63.9	0.086	-53.4	1.046	10.16
2.2	0.252	161.5	2.816	61.2	0.218	63.0	0.075	-54.2	1.047	9.78
2.3	0.257	159.8	2.696	59.5	0.227	62.2	0.067	-60.5	1.049	9.39
2.4	0.267	157.2	2.595	57.9	0.236	61.4	0.057	-62.5	1.048	9.07
2.5	0.276	155.4	2.502	56.4	0.244	60.5	0.050	-71.3	1.048	8.76
2.6	0.281	153.2	2.408	54.8	0.253	59.5	0.041	-74.6	1.050	8.42
2.7	0.289	152.0	2.329	53.4	0.261	58.8	0.035	-88.7	1.051	8.14
2.8	0.297	150.0	2.249	52.2	0.267	57.9	0.028	-97.7	1.054	7.83
2.9	0.305	149.1	2.196	50.5	0.276	57.4	0.027	-120.7	1.049	7.65
3.0	0.310	146.7	2.147	49.4	0.284	56.9	0.024	-140.1	1.047	7.46
4.0	0.391	138.4	1.717	36.5	0.365	48.0	0.110	151.8	1.020	5.86
5.0	0.476	127.7	1.416	24.6	0.428	39.8	0.210	137.5	1.007	4.69

PACKAGE DIMENSIONS

FLAT-LEAD 3-PIN THIN-TYPE ULTRA SUPER MINIMOLD (UNIT: mm)



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

[MEMO]

[MEMO]

[MEMO]

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