NEC

NPN SILICON RF TRANSISTOR
2SC5676

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 OSC applications
- Flat-lead 3-pin thin-type ultra super minimold package

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
2SC5676	50 pcs (Non reel)	• 8 mm wide embossed taping
2SC5676-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°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	9	V
Collector to Emitter Voltage	V_{CEO}	5.5	V
Emitter to Base Voltage	V_{EBO}	1.5	V
Collector Current	I_C	100	mA
Total Power Dissipation	P_{tot} Note	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–65 to +150	°C

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

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

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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	–	–	200	nA
Emitter Cut-off Current	I_{EBO}	V_{BE} = 1 V, I_C = 0 mA	–	–	200	nA
DC Current Gain	h_{FE} Note 1	V_{CE} = 1 V, I_C = 10 mA	100	–	160	–
RF Characteristics						
Gain Bandwidth Product	f_T	V_{CE} = 1 V, I_C = 10 mA, f = 2 GHz	4.0	5.5	–	GHz
Insertion Power Gain	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 10 mA, f = 2 GHz	2.5	4.0	–	dB
Noise Figure	NF	V_{CE} = 1 V, I_C = 10 mA, f = 2 GHz, $Z_S = Z_{opt}$	–	1.8	3.0	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 0.5 V, I_E = 0 mA, f = 1 MHz	–	0.9	1.2	pF

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

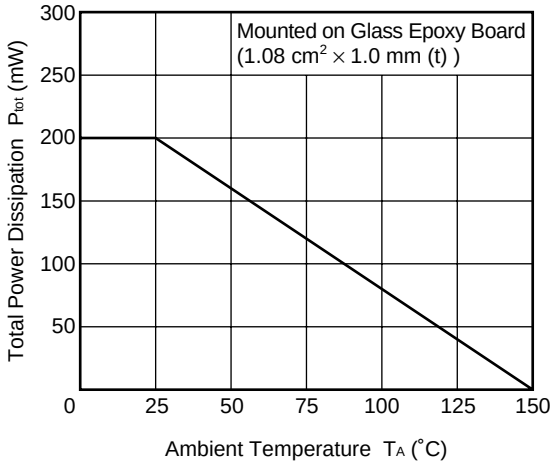
2. Collector to base capacitance measured using capacitance meter (self-balancing bridge method) when the emitter is connected to the guard pin

h_{FE} CLASSIFICATION

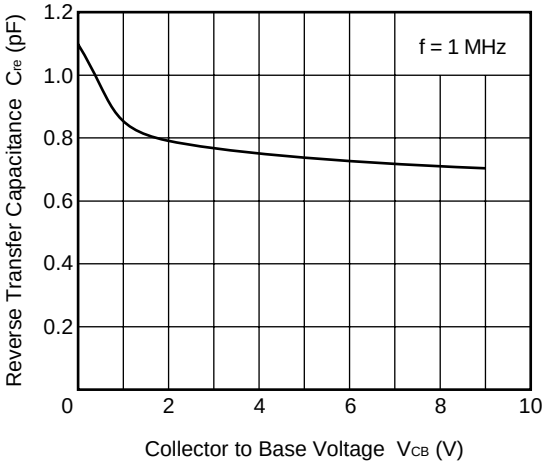
Rank	FB
Marking	UC
h_{FE} Value	100 to 160

TYPICAL CHARACTERISTICS (Unless otherwise specified, T_A = +25°C)

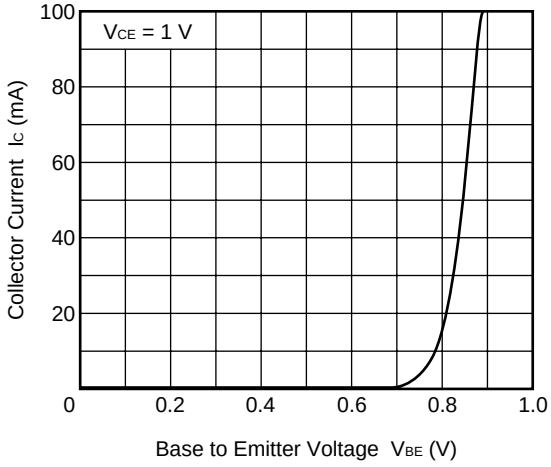
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



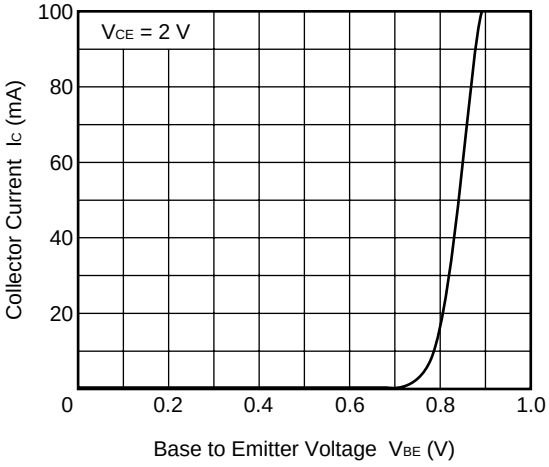
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



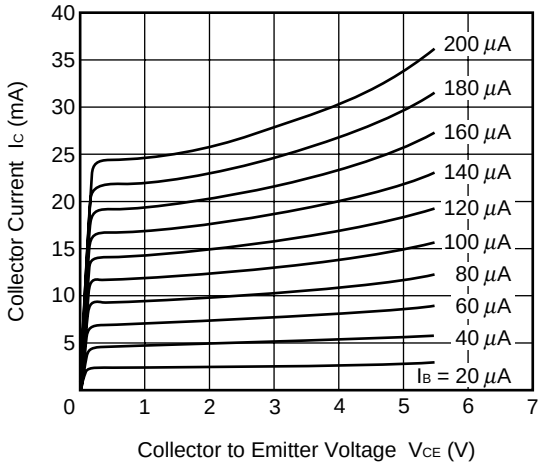
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



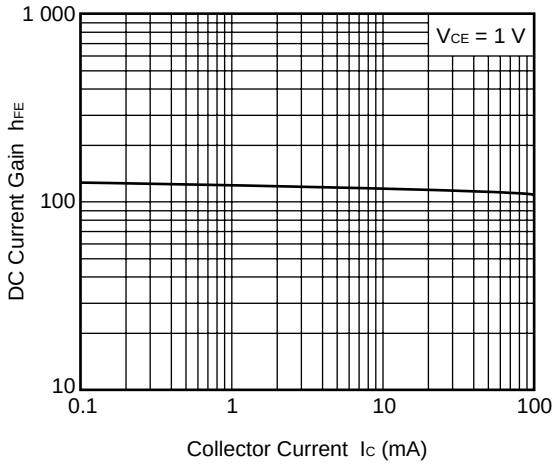
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



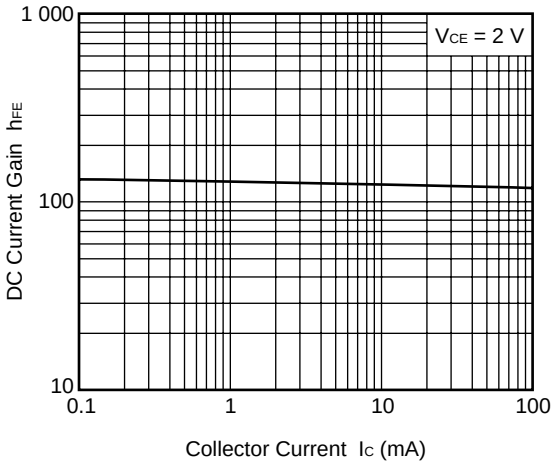
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



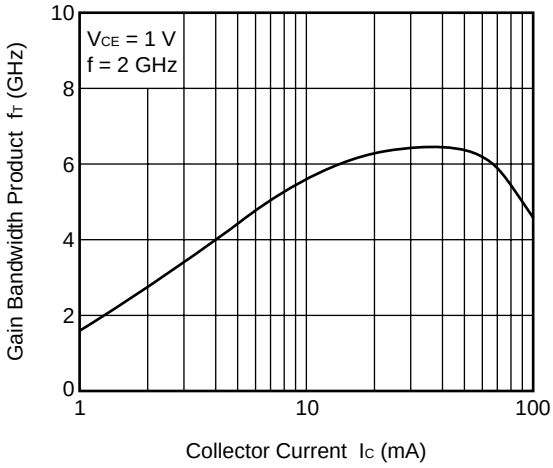
DC CURRENT GAIN vs.
COLLECTOR CURRENT



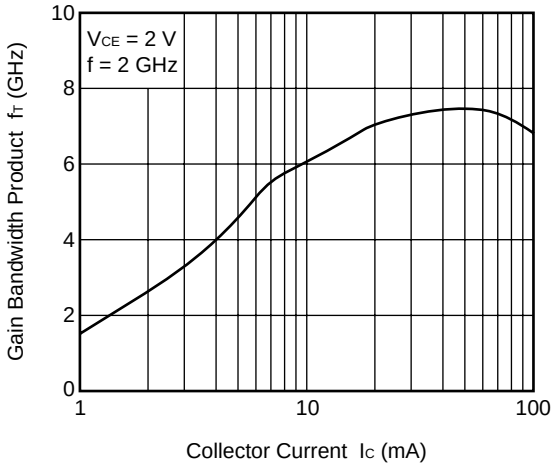
DC CURRENT GAIN vs.
COLLECTOR CURRENT



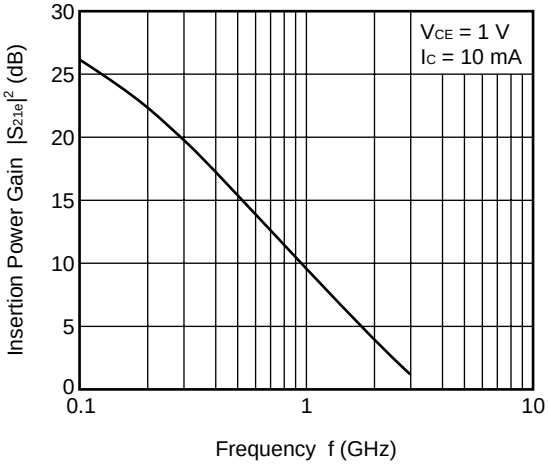
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



INSERTION POWER GAIN vs. FREQUENCY



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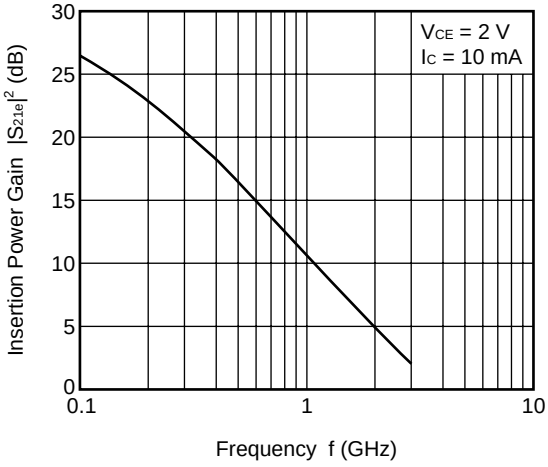

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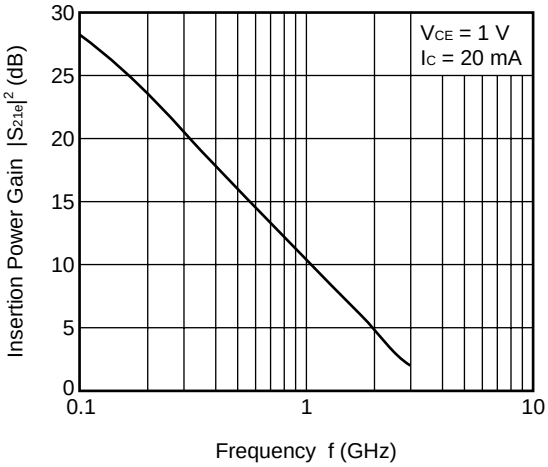

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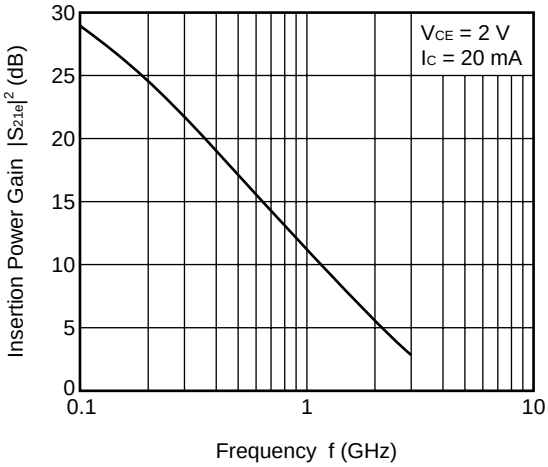
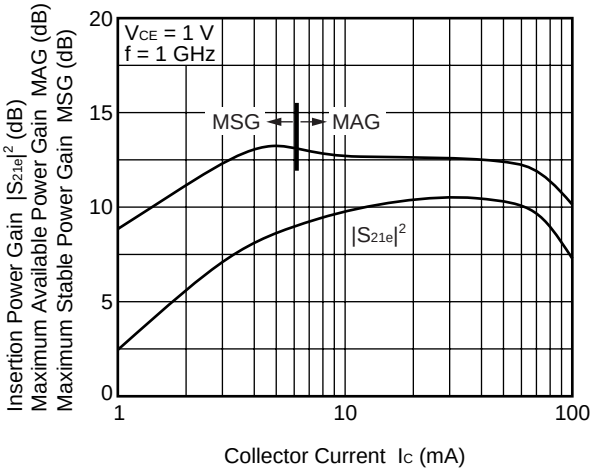
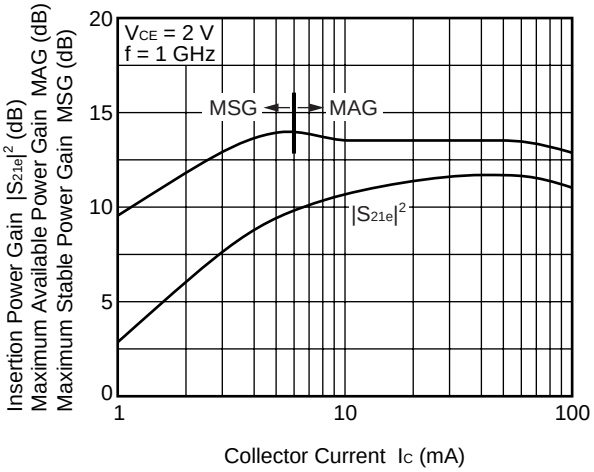


INSERTION POWER GAIN, MAG, MSG vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MAG, MSG vs. COLLECTOR CURRENT



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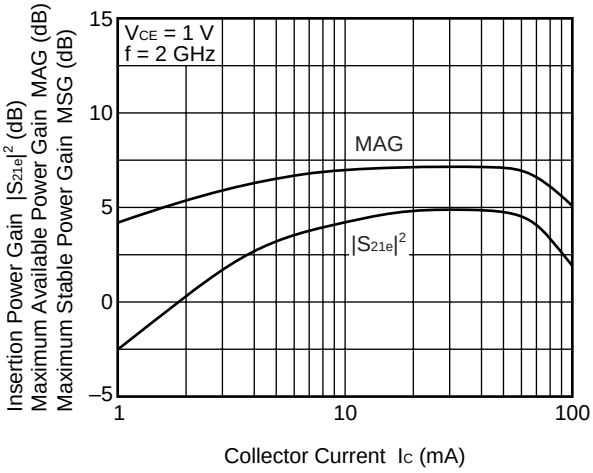

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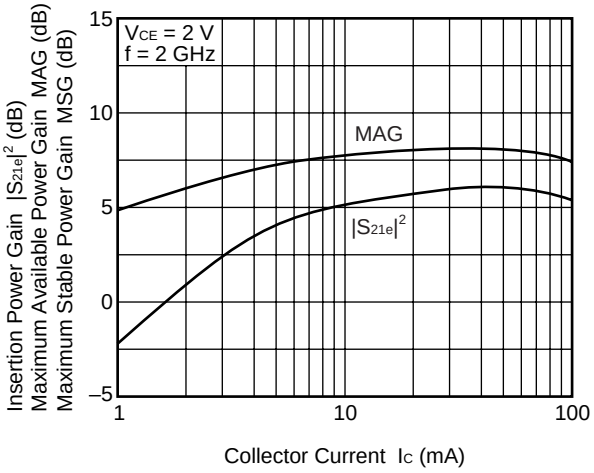

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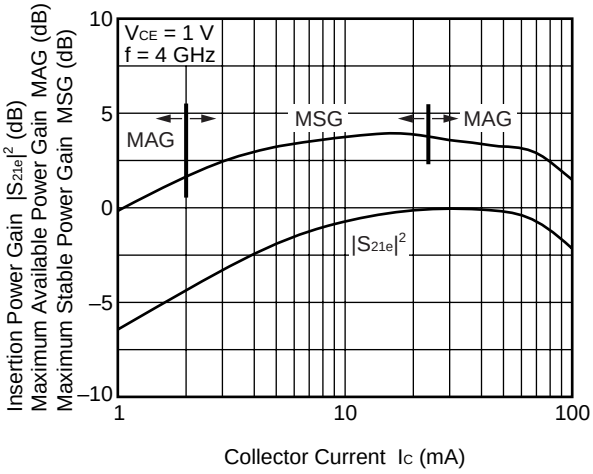

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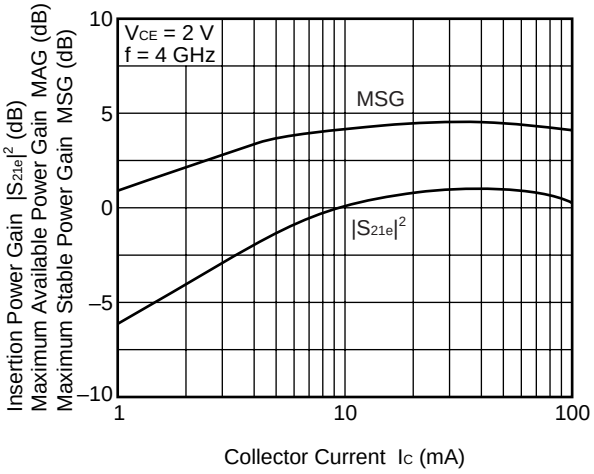
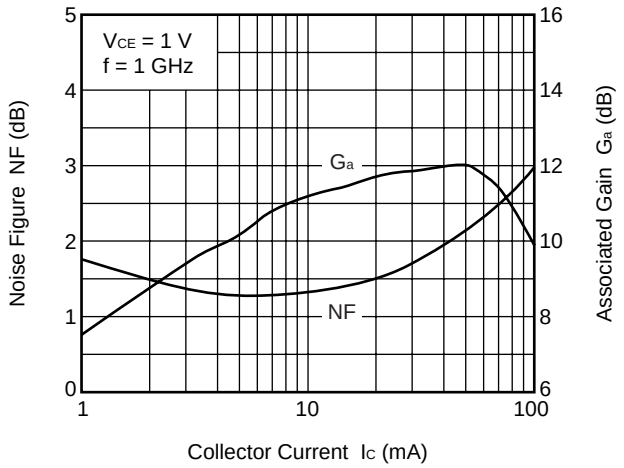
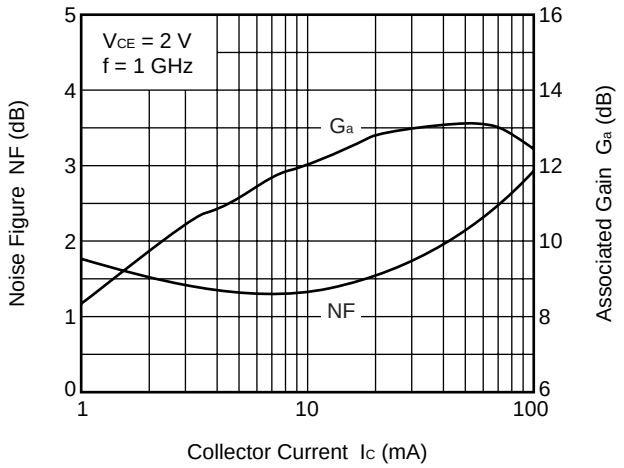


NOISE FIGURE, ASSOCIATED GAIN vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN vs. COLLECTOR CURRENT



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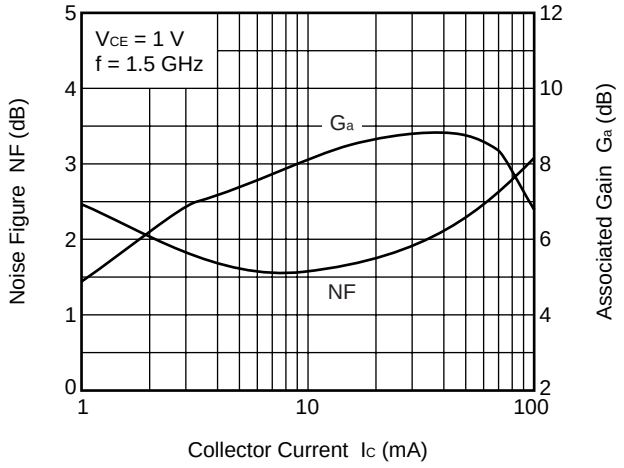

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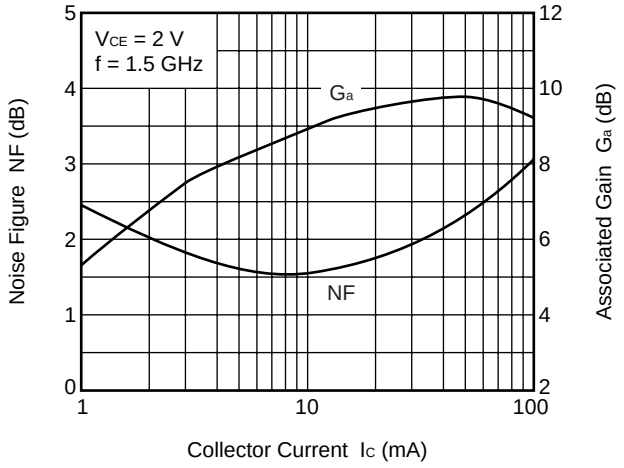

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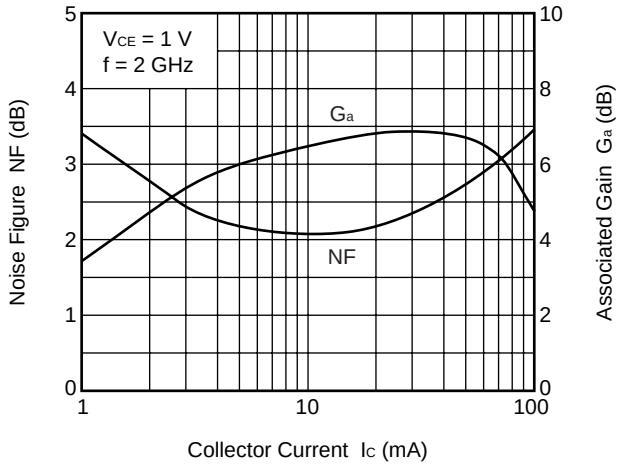

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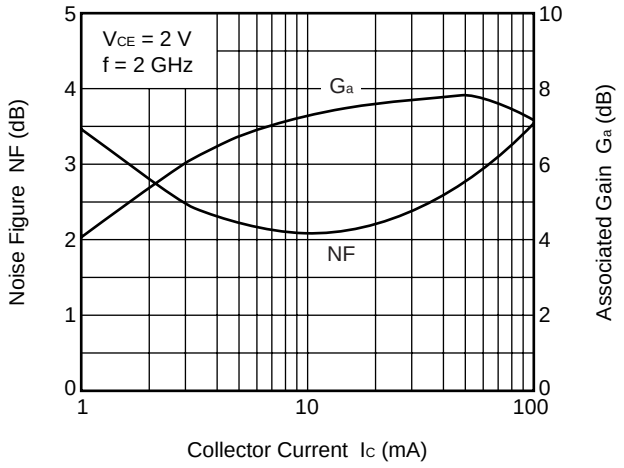


Remark The graphs indicate nominal characteristics.

S-PARAMETERS

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

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

V_{CE} = 1 V, I_C = 1 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG Note
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.959	–27.4	3.408	161.7	0.061	75.6	0.974	–10.8	0.025	17.46
0.2	0.907	–53.4	3.215	143.7	0.110	60.1	0.908	–20.2	0.116	14.66
0.3	0.857	–74.4	2.826	129.2	0.145	47.8	0.833	–27.3	0.195	12.91
0.4	0.820	–92.3	2.488	117.6	0.166	38.9	0.765	–32.7	0.245	11.77
0.5	0.792	–107.1	2.203	107.3	0.178	31.6	0.709	–36.9	0.307	10.91
0.6	0.769	–119.3	1.945	98.5	0.184	26.0	0.663	–40.3	0.373	10.23
0.7	0.757	–129.7	1.741	91.3	0.187	21.7	0.631	–43.4	0.427	9.70
0.8	0.745	–138.2	1.576	84.7	0.185	18.2	0.603	–46.2	0.497	9.29
0.9	0.737	–145.6	1.437	79.2	0.182	15.6	0.584	–49.3	0.561	8.98
1.0	0.738	–152.4	1.331	73.8	0.177	13.6	0.568	–52.4	0.615	8.76
1.1	0.733	–157.8	1.228	69.0	0.171	12.2	0.555	–55.7	0.699	8.57
1.2	0.731	–163.0	1.148	64.5	0.163	11.5	0.542	–59.3	0.783	8.48
1.3	0.733	–167.7	1.076	60.7	0.156	11.6	0.538	–63.1	0.849	8.39
1.4	0.733	–171.9	1.012	56.7	0.148	12.1	0.530	–67.0	0.945	8.34
1.5	0.736	–175.8	0.955	53.3	0.141	13.9	0.527	–71.2	1.030	7.27
1.6	0.734	–179.4	0.906	50.0	0.133	16.4	0.525	–75.6	1.141	6.03
1.7	0.741	177.2	0.859	47.2	0.128	19.8	0.524	–80.0	1.210	5.51
1.8	0.743	173.8	0.827	44.2	0.123	24.2	0.523	–84.6	1.286	5.06
1.9	0.745	170.1	0.786	41.2	0.120	29.2	0.523	–89.4	1.372	4.51
2.0	0.752	167.3	0.752	38.7	0.121	35.3	0.525	–94.0	1.386	4.25
2.1	0.756	164.1	0.719	36.4	0.123	41.1	0.528	–98.8	1.399	3.91
2.2	0.758	161.3	0.689	34.4	0.129	46.7	0.533	–103.8	1.383	3.58
2.3	0.766	158.8	0.661	32.6	0.138	51.9	0.537	–108.6	1.323	3.41
2.4	0.770	156.2	0.638	31.5	0.149	55.9	0.541	–113.4	1.268	3.22
2.5	0.776	153.8	0.612	30.0	0.161	59.0	0.546	–118.4	1.213	3.01
2.6	0.781	151.7	0.589	28.6	0.175	61.4	0.554	–123.5	1.161	2.84
2.7	0.783	149.6	0.571	28.0	0.190	62.8	0.561	–128.5	1.123	2.66
2.8	0.785	147.9	0.553	27.4	0.205	63.8	0.569	–133.1	1.100	2.39
2.9	0.792	145.7	0.546	26.6	0.221	64.0	0.575	–137.5	1.032	2.83
3.0	0.795	144.0	0.530	27.1	0.237	64.1	0.577	–142.2	1.035	2.34
4.0	0.784	129.6	0.480	26.6	0.396	52.2	0.654	176.5	1.021	–0.05
5.0	0.783	119.3	0.495	25.6	0.467	38.9	0.702	149.8	1.040	–0.98

V_{CE} = 1 V, I_C = 3 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.869	–41.8	9.136	152.7	0.056	69.1	0.907	–22.3	0.081	22.15
0.2	0.783	–77.5	7.629	131.3	0.090	51.3	0.744	–38.3	0.192	19.27
0.3	0.720	–102.1	6.084	117.1	0.108	41.4	0.606	–48.0	0.289	17.49
0.4	0.686	–119.8	4.986	107.0	0.118	35.9	0.507	–54.1	0.375	16.27
0.5	0.662	–133.3	4.186	98.6	0.123	32.8	0.437	–58.1	0.469	15.33
0.6	0.650	–143.0	3.577	92.1	0.126	31.3	0.386	–61.2	0.559	14.53
0.7	0.645	–151.2	3.116	86.7	0.129	30.7	0.349	–63.9	0.641	13.85
0.8	0.641	–157.5	2.768	82.0	0.130	31.0	0.322	–66.6	0.724	13.29
0.9	0.640	–163.4	2.494	77.7	0.131	31.6	0.301	–69.3	0.802	12.79
1.0	0.642	–168.4	2.280	73.8	0.133	32.8	0.285	–72.3	0.865	12.35
1.1	0.642	–172.5	2.089	70.2	0.135	34.2	0.273	–75.5	0.934	11.91
1.2	0.642	–176.0	1.936	66.6	0.137	35.8	0.262	–79.1	0.998	11.52
1.3	0.645	–179.7	1.803	63.6	0.140	37.6	0.256	–82.9	1.044	9.83
1.4	0.649	177.2	1.686	60.3	0.143	39.5	0.251	–87.1	1.087	8.93
1.5	0.648	174.0	1.582	57.4	0.147	41.5	0.249	–91.4	1.134	8.11
1.6	0.652	171.3	1.504	54.6	0.151	43.3	0.248	–96.0	1.150	7.62
1.7	0.659	168.6	1.424	52.0	0.157	45.1	0.249	–100.7	1.157	7.18
1.8	0.661	166.2	1.364	49.3	0.163	46.8	0.251	–105.6	1.165	6.77
1.9	0.660	163.3	1.300	46.7	0.169	48.2	0.254	–110.4	1.185	6.25
2.0	0.670	160.7	1.245	44.0	0.176	49.5	0.258	–115.3	1.166	6.03
2.1	0.675	158.5	1.193	41.7	0.184	50.7	0.264	–120.0	1.162	5.69
2.2	0.682	156.3	1.143	39.5	0.192	51.6	0.270	–124.9	1.145	5.43
2.3	0.689	154.6	1.101	37.3	0.201	52.7	0.278	–129.5	1.125	5.24
2.4	0.694	152.3	1.062	35.6	0.210	53.3	0.286	–133.8	1.111	5.01
2.5	0.701	150.5	1.022	33.7	0.220	53.9	0.295	–138.4	1.095	4.81
2.6	0.706	148.9	0.985	31.6	0.229	54.5	0.306	–142.6	1.082	4.58
2.7	0.711	147.2	0.954	29.9	0.239	54.7	0.316	–146.9	1.066	4.44
2.8	0.714	146.0	0.920	28.5	0.249	55.0	0.328	–150.7	1.061	4.16
2.9	0.725	144.1	0.905	26.7	0.260	54.9	0.338	–154.1	1.020	4.56
3.0	0.728	143.0	0.878	26.0	0.270	54.9	0.346	–158.1	1.018	4.30
4.0	0.749	130.9	0.686	16.2	0.386	47.2	0.477	169.4	0.968	2.50
5.0	0.770	120.8	0.592	13.3	0.453	37.4	0.587	147.3	0.990	1.16

V_{CE} = 1 V, I_C = 5 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.792	–54.3	13.464	145.9	0.052	63.2	0.839	–31.9	0.143	24.16
0.2	0.700	–94.8	10.258	123.3	0.076	47.5	0.624	–51.6	0.269	21.30
0.3	0.644	–118.9	7.718	110.2	0.088	41.0	0.476	–62.5	0.401	19.42
0.4	0.624	–134.5	6.132	101.3	0.095	38.4	0.381	–69.8	0.511	18.10
0.5	0.611	–146.1	5.061	94.3	0.100	38.0	0.316	–74.9	0.618	17.04
0.6	0.606	–154.5	4.274	88.9	0.105	38.8	0.272	–79.2	0.714	16.10
0.7	0.604	–161.4	3.697	84.1	0.110	39.8	0.240	–83.2	0.796	15.26
0.8	0.605	–166.6	3.270	80.2	0.115	41.2	0.216	–87.3	0.866	14.54
0.9	0.604	–171.1	2.935	76.5	0.120	42.9	0.198	–91.4	0.933	13.89
1.0	0.610	–175.5	2.670	73.1	0.126	44.3	0.186	–95.7	0.972	13.28
1.1	0.610	–178.9	2.442	69.9	0.132	45.8	0.176	–100.1	1.019	11.83
1.2	0.615	177.7	2.258	66.6	0.138	47.0	0.170	–105.1	1.047	10.82
1.3	0.615	174.9	2.098	63.9	0.144	48.3	0.166	–109.8	1.080	9.90
1.4	0.619	172.1	1.960	61.0	0.152	49.5	0.165	–114.9	1.096	9.22
1.5	0.622	169.7	1.840	58.5	0.159	50.5	0.166	–119.9	1.111	8.60
1.6	0.625	167.1	1.747	56.0	0.167	51.3	0.168	–124.8	1.117	8.11
1.7	0.629	165.2	1.653	53.5	0.175	52.0	0.173	–129.6	1.118	7.65
1.8	0.633	162.6	1.578	51.1	0.183	52.3	0.178	–134.5	1.118	7.25
1.9	0.633	159.9	1.506	48.5	0.192	52.7	0.185	–138.9	1.127	6.79
2.0	0.640	158.0	1.439	46.1	0.200	52.9	0.192	–143.1	1.119	6.47
2.1	0.649	155.8	1.378	43.8	0.208	53.1	0.200	–147.3	1.108	6.21
2.2	0.654	153.9	1.322	41.7	0.217	53.0	0.210	–151.4	1.101	5.91
2.3	0.662	152.4	1.273	39.8	0.226	53.2	0.219	–155.1	1.088	5.70
2.4	0.664	150.5	1.228	38.1	0.235	53.1	0.228	–158.6	1.085	5.39
2.5	0.673	148.8	1.185	36.0	0.244	53.0	0.239	–162.2	1.070	5.25
2.6	0.680	147.2	1.141	34.1	0.253	53.0	0.250	–165.2	1.061	5.03
2.7	0.685	145.7	1.107	32.3	0.262	52.8	0.261	–168.5	1.053	4.86
2.8	0.689	144.7	1.072	30.6	0.270	52.7	0.272	–171.2	1.048	4.64
2.9	0.700	142.8	1.054	28.8	0.280	52.3	0.283	–173.8	1.017	4.97
3.0	0.701	142.1	1.020	28.1	0.289	52.1	0.290	–176.8	1.024	4.53
4.0	0.729	131.0	0.804	16.0	0.387	44.4	0.419	159.7	0.972	3.18
5.0	0.758	121.3	0.673	11.0	0.447	36.1	0.532	142.9	0.979	1.78

V_{CE} = 1 V, I_C = 7 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.723	–64.4	16.730	140.5	0.048	59.7	0.780	–39.6	0.198	25.47
0.2	0.645	–107.6	11.875	117.9	0.067	46.2	0.542	–61.6	0.345	22.49
0.3	0.605	–129.7	8.651	106.0	0.076	42.6	0.399	–74.1	0.495	20.55
0.4	0.593	–143.9	6.770	98.1	0.083	42.5	0.313	–82.8	0.617	19.12
0.5	0.585	–154.0	5.534	91.7	0.089	43.4	0.258	–89.7	0.726	17.93
0.6	0.586	–161.3	4.656	86.9	0.096	44.9	0.220	–95.9	0.811	16.86
0.7	0.585	–167.3	4.014	82.7	0.103	46.5	0.194	–101.9	0.883	15.91
0.8	0.585	–171.8	3.543	79.1	0.110	48.2	0.176	–107.9	0.945	15.09
0.9	0.588	–175.7	3.173	75.8	0.117	49.8	0.163	–113.7	0.988	14.32
1.0	0.593	–179.3	2.881	72.6	0.125	51.0	0.155	–119.6	1.015	12.86
1.1	0.595	177.4	2.637	69.6	0.133	52.1	0.149	–125.1	1.043	11.70
1.2	0.597	174.6	2.433	66.6	0.142	52.9	0.147	–130.8	1.065	10.79
1.3	0.600	172.0	2.257	64.1	0.150	53.6	0.147	–136.2	1.081	10.03
1.4	0.605	169.6	2.107	61.3	0.159	54.2	0.149	–141.4	1.089	9.41
1.5	0.607	167.1	1.981	59.0	0.168	54.7	0.153	–145.9	1.098	8.82
1.6	0.611	164.9	1.877	56.5	0.177	54.9	0.158	–150.0	1.096	8.37
1.7	0.615	162.8	1.774	54.2	0.186	55.0	0.165	–153.9	1.099	7.87
1.8	0.621	160.8	1.697	51.9	0.195	54.9	0.173	–157.8	1.091	7.55
1.9	0.622	158.3	1.618	49.4	0.204	54.7	0.181	–161.1	1.095	7.11
2.0	0.628	156.3	1.543	47.1	0.213	54.5	0.189	–164.3	1.093	6.74
2.1	0.635	154.3	1.478	44.9	0.222	54.2	0.198	–167.5	1.087	6.44
2.2	0.640	152.4	1.418	43.0	0.231	53.7	0.208	–170.7	1.084	6.12
2.3	0.648	150.9	1.366	41.0	0.240	53.5	0.218	–173.4	1.071	5.93
2.4	0.654	149.2	1.317	39.3	0.249	53.2	0.227	–176.0	1.064	5.69
2.5	0.661	147.7	1.271	37.4	0.258	52.6	0.238	–178.7	1.056	5.47
2.6	0.666	146.2	1.226	35.7	0.267	52.4	0.248	179.1	1.051	5.24
2.7	0.671	144.8	1.189	33.8	0.275	52.0	0.259	176.5	1.048	5.03
2.8	0.677	144.0	1.148	32.2	0.283	51.7	0.269	174.4	1.042	4.83
2.9	0.686	142.2	1.132	30.4	0.292	51.2	0.279	172.6	1.018	5.06
3.0	0.688	141.4	1.099	29.5	0.300	50.9	0.286	170.0	1.022	4.73
4.0	0.717	131.0	0.866	17.1	0.389	42.9	0.402	152.2	0.983	3.47
5.0	0.751	121.7	0.724	10.5	0.444	35.2	0.510	138.6	0.979	2.12

V_{CE} = 1 V, I_C = 10 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.654	–78.7	20.296	134.4	0.042	56.1	0.707	–49.1	0.248	26.85
0.2	0.595	–120.1	13.332	112.7	0.056	47.2	0.460	–73.7	0.442	23.75
0.3	0.572	–141.0	9.467	102.1	0.065	45.8	0.333	–88.3	0.610	21.60
0.4	0.571	–153.2	7.326	95.1	0.073	47.7	0.264	–99.2	0.731	20.03
0.5	0.564	–161.6	5.939	89.5	0.081	49.7	0.220	–108.5	0.834	18.65
0.6	0.566	–167.7	4.983	85.2	0.090	51.9	0.193	–117.1	0.904	17.44
0.7	0.574	–172.7	4.289	81.4	0.099	53.6	0.175	–125.1	0.949	16.37
0.8	0.574	–176.6	3.777	78.1	0.108	54.9	0.165	–132.6	0.992	15.44
0.9	0.574	180.0	3.382	75.1	0.117	56.1	0.158	–139.4	1.025	13.64
1.0	0.581	176.9	3.067	72.1	0.127	56.8	0.156	–145.7	1.037	12.66
1.1	0.583	174.0	2.803	69.3	0.136	57.4	0.155	–151.2	1.055	11.69
1.2	0.587	171.8	2.587	66.5	0.146	57.7	0.157	–156.5	1.063	10.94
1.3	0.592	169.3	2.400	64.1	0.156	57.8	0.160	–161.1	1.070	10.25
1.4	0.595	167.1	2.238	61.6	0.166	57.9	0.165	–165.2	1.076	9.61
1.5	0.598	164.7	2.100	59.3	0.176	57.9	0.170	–168.5	1.080	9.04
1.6	0.600	162.9	1.989	57.1	0.186	57.7	0.177	–171.6	1.080	8.56
1.7	0.606	161.0	1.879	54.8	0.197	57.4	0.185	–174.3	1.077	8.11
1.8	0.610	158.9	1.796	52.6	0.206	56.9	0.194	–176.9	1.073	7.75
1.9	0.611	156.7	1.711	50.4	0.215	56.3	0.202	–179.3	1.079	7.29
2.0	0.619	154.7	1.633	48.0	0.224	55.7	0.211	178.4	1.072	6.98
2.1	0.627	152.8	1.562	46.1	0.234	55.1	0.220	176.0	1.067	6.67
2.2	0.632	151.0	1.501	44.2	0.243	54.3	0.230	173.7	1.061	6.39
2.3	0.638	149.8	1.440	42.3	0.252	53.8	0.239	171.7	1.058	6.09
2.4	0.644	148.0	1.394	40.4	0.261	53.2	0.248	169.7	1.051	5.88
2.5	0.651	146.4	1.344	38.7	0.270	52.5	0.258	167.5	1.045	5.67
2.6	0.656	145.3	1.296	37.0	0.279	52.0	0.267	165.9	1.041	5.43
2.7	0.661	143.8	1.254	35.2	0.287	51.4	0.277	163.7	1.041	5.18
2.8	0.665	142.9	1.215	33.6	0.295	51.0	0.286	162.0	1.039	4.95
2.9	0.676	141.5	1.197	31.8	0.303	50.4	0.296	160.9	1.017	5.17
3.0	0.679	140.9	1.165	31.0	0.311	50.0	0.301	158.6	1.017	4.94
4.0	0.707	130.8	0.923	18.4	0.394	41.4	0.402	144.7	0.990	3.70
5.0	0.745	121.8	0.775	11.1	0.443	34.3	0.498	134.0	0.979	2.43

V_{CE} = 1 V, I_C = 20 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.531	–109.0	25.984	123.1	0.032	54.9	0.561	–69.3	0.412	29.16
0.2	0.550	–143.9	15.222	104.7	0.043	53.4	0.350	–98.9	0.651	25.53
0.3	0.542	–157.9	10.479	96.4	0.053	55.8	0.269	–117.4	0.812	22.97
0.4	0.550	–166.5	7.998	90.8	0.063	59.4	0.233	–131.1	0.899	21.00
0.5	0.549	–172.5	6.433	86.3	0.074	61.5	0.213	–142.0	0.962	19.38
0.6	0.553	–176.6	5.388	82.8	0.086	62.9	0.204	–150.9	0.994	17.97
0.7	0.559	179.8	4.622	79.5	0.097	63.5	0.200	–158.2	1.017	15.97
0.8	0.560	176.9	4.061	76.7	0.109	64.1	0.200	–164.5	1.036	14.55
0.9	0.565	174.1	3.629	74.0	0.120	64.3	0.202	–169.8	1.045	13.50
1.0	0.571	171.7	3.287	71.3	0.132	64.1	0.205	–174.3	1.047	12.63
1.1	0.573	169.3	3.004	68.9	0.144	63.9	0.208	–178.1	1.054	11.79
1.2	0.576	167.5	2.770	66.3	0.155	63.4	0.213	178.3	1.057	11.07
1.3	0.581	165.5	2.569	64.1	0.167	62.9	0.219	175.2	1.057	10.43
1.4	0.584	163.4	2.391	61.8	0.178	62.3	0.226	172.6	1.061	9.79
1.5	0.588	161.4	2.244	59.8	0.189	61.7	0.231	170.4	1.059	9.26
1.6	0.592	159.7	2.119	57.7	0.200	61.0	0.238	168.5	1.057	8.79
1.7	0.597	158.2	2.007	55.5	0.211	60.1	0.246	166.6	1.054	8.36
1.8	0.600	156.1	1.911	53.4	0.221	59.2	0.254	165.0	1.054	7.95
1.9	0.602	153.8	1.824	51.4	0.231	58.1	0.262	163.3	1.055	7.54
							0.271	161.8	1.053	7.17
2.0	0.608	152.5	1.736	49.2	0.241	57.1				
2.1	0.615	150.8	1.664	47.4	0.250	56.1	0.279	159.9	1.049	6.87
2.2	0.622	149.0	1.594	45.6	0.260	55.0	0.288	158.3	1.046	6.56
2.3	0.630	147.9	1.533	43.8	0.269	54.2	0.297	156.7	1.040	6.33
2.4	0.633	146.3	1.480	42.1	0.278	53.2	0.305	155.1	1.039	6.05
2.5	0.643	144.9	1.427	40.5	0.287	52.4	0.313	153.4	1.033	5.85
2.6	0.648	143.6	1.379	38.7	0.296	51.6	0.321	152.0	1.030	5.62
2.7	0.655	142.7	1.336	37.0	0.303	50.8	0.329	150.3	1.027	5.44
2.8	0.656	141.7	1.291	35.4	0.311	50.2	0.338	148.9	1.030	5.12
2.9	0.665	140.4	1.271	33.7	0.319	49.5	0.345	148.0	1.017	5.20
3.0	0.669	139.4	1.239	33.0	0.326	48.9	0.349	146.0	1.016	5.01
4.0	0.695	130.4	0.988	20.5	0.401	39.5	0.427	134.7	1.000	3.91
5.0	0.732	121.8	0.836	12.8	0.443	32.6	0.503	126.5	0.993	2.76

V_{CE} = 2 V, I_C = 1 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.960	–25.2	3.358	163.0	0.052	77.1	0.977	–9.1	0.023	18.13
0.2	0.919	–49.9	3.205	145.8	0.095	61.9	0.925	–17.2	0.118	15.30
0.3	0.868	–70.6	2.847	132.1	0.126	50.5	0.861	–23.5	0.182	13.53
0.4	0.832	–88.3	2.532	120.8	0.146	41.5	0.802	–28.3	0.231	12.39
0.5	0.800	–103.3	2.261	110.5	0.158	34.2	0.750	–32.0	0.294	11.55
0.6	0.780	–115.4	2.012	102.0	0.165	28.7	0.707	–35.1	0.354	10.87
0.7	0.764	–126.2	1.806	94.7	0.167	24.2	0.675	–37.9	0.409	10.34
0.8	0.751	–135.0	1.633	88.3	0.166	20.7	0.651	–40.6	0.475	9.92
0.9	0.744	–142.6	1.497	82.7	0.163	18.2	0.632	–43.2	0.534	9.62
1.0	0.742	–149.5	1.381	77.3	0.159	16.2	0.616	–46.0	0.595	9.38
1.1	0.737	–155.5	1.278	72.6	0.154	14.9	0.603	–49.0	0.672	9.20
1.2	0.734	–160.7	1.197	68.2	0.147	14.5	0.592	–52.0	0.753	9.11
1.3	0.734	–165.4	1.121	64.4	0.140	14.6	0.584	–55.3	0.832	9.03
1.4	0.736	–170.0	1.055	60.4	0.133	15.5	0.576	–58.9	0.920	9.00
1.5	0.734	–174.2	0.993	57.1	0.126	17.4	0.572	–62.7	1.025	8.00
1.6	0.736	–177.8	0.947	53.8	0.119	20.4	0.568	–66.5	1.116	6.92
1.7	0.739	178.6	0.895	50.9	0.114	24.4	0.565	–70.5	1.212	6.16
1.8	0.743	175.3	0.863	47.9	0.111	29.4	0.562	–74.7	1.271	5.79
1.9	0.741	171.3	0.818	44.9	0.109	35.1	0.562	–79.2	1.365	5.14
2.0	0.747	168.1	0.786	42.1	0.111	41.6	0.560	–83.4	1.370	4.89
2.1	0.751	165.1	0.753	40.0	0.114	47.8	0.561	–87.9	1.365	4.58
2.2	0.756	162.3	0.721	38.1	0.121	53.5	0.562	–92.7	1.328	4.31
2.3	0.763	159.8	0.695	35.9	0.131	58.5	0.566	–97.3	1.245	4.28
2.4	0.766	157.0	0.669	34.7	0.142	62.2	0.566	–101.9	1.197	4.04
2.5	0.769	154.4	0.641	33.1	0.155	65.0	0.568	–106.8	1.161	3.73
2.6	0.774	152.3	0.620	31.9	0.170	67.2	0.572	–111.7	1.101	3.70
2.7	0.779	150.2	0.600	30.7	0.184	68.5	0.577	–116.6	1.058	3.65
2.8	0.778	148.5	0.580	30.0	0.200	69.3	0.583	–121.1	1.043	3.37
2.9	0.789	146.2	0.572	29.3	0.216	69.5	0.586	–125.5	0.972	4.22
3.0	0.789	144.6	0.555	29.7	0.233	69.4	0.584	–130.3	0.986	3.76
4.0	0.779	129.9	0.494	28.0	0.398	56.4	0.646	–174.1	0.996	0.94
5.0	0.776	119.6	0.504	26.8	0.475	41.8	0.692	156.2	1.031	–0.82

V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.875	–38.1	9.058	155.0	0.048	70.1	0.925	–18.6	0.090	22.76
0.2	0.793	–71.2	7.796	134.4	0.080	54.3	0.783	–32.2	0.193	19.90
0.3	0.726	–95.0	6.315	120.3	0.097	44.2	0.656	–40.5	0.287	18.13
0.4	0.690	–113.5	5.250	110.1	0.107	38.4	0.561	–45.6	0.364	16.92
0.5	0.662	–127.4	4.444	101.6	0.112	35.1	0.493	–48.7	0.455	15.99
0.6	0.647	–138.0	3.808	95.0	0.115	33.4	0.442	–50.9	0.542	15.19
0.7	0.638	–146.7	3.336	89.4	0.118	32.7	0.405	–52.8	0.624	14.52
0.8	0.631	–153.5	2.963	84.6	0.119	32.9	0.377	–54.7	0.712	13.96
0.9	0.631	–159.7	2.674	80.4	0.120	33.7	0.356	–56.5	0.783	13.47
1.0	0.632	–164.9	2.443	76.3	0.122	34.9	0.339	–58.7	0.848	13.02
1.1	0.630	–169.4	2.240	72.7	0.124	36.2	0.325	–61.0	0.920	12.58
1.2	0.630	–173.2	2.073	69.2	0.125	38.0	0.313	–63.8	0.989	12.20
1.3	0.632	–176.9	1.930	66.2	0.128	40.0	0.305	–66.7	1.037	10.61
1.4	0.634	179.6	1.808	62.9	0.131	42.0	0.297	–70.1	1.084	9.64
1.5	0.637	176.4	1.699	60.0	0.134	44.3	0.292	–73.7	1.120	8.91
1.6	0.639	173.4	1.614	57.2	0.139	46.3	0.288	–77.6	1.140	8.38
1.7	0.645	170.8	1.527	54.7	0.144	48.4	0.285	–81.7	1.148	7.91
1.8	0.648	168.1	1.460	51.9	0.150	50.2	0.283	–86.1	1.155	7.50
1.9	0.648	165.0	1.389	49.1	0.156	51.6	0.283	–90.6	1.172	6.97
2.0	0.655	162.7	1.327	46.6	0.164	53.3	0.283	–95.1	1.161	6.65
2.1	0.661	160.1	1.277	44.2	0.171	54.7	0.285	–99.7	1.147	6.41
2.2	0.669	158.0	1.226	41.9	0.179	55.7	0.287	–104.6	1.126	6.19
2.3	0.677	156.2	1.179	39.8	0.188	56.9	0.291	–109.3	1.100	6.04
2.4	0.681	154.0	1.136	37.9	0.198	57.6	0.295	–113.9	1.085	5.81
2.5	0.689	152.0	1.094	35.9	0.207	58.1	0.300	–118.7	1.067	5.64
2.6	0.694	150.4	1.054	34.0	0.217	58.8	0.308	–123.5	1.053	5.46
2.7	0.698	148.6	1.021	32.2	0.227	59.1	0.315	–128.1	1.038	5.33
2.8	0.705	147.3	0.984	30.5	0.237	59.4	0.323	–132.3	1.023	5.26
2.9	0.712	145.4	0.967	28.8	0.248	59.3	0.330	–136.3	0.990	5.90
3.0	0.718	144.3	0.934	28.1	0.259	59.4	0.335	–141.0	0.983	5.56
4.0	0.741	131.8	0.728	17.2	0.382	51.5	0.454	–179.2	0.931	2.80
5.0	0.765	121.4	0.618	13.8	0.457	40.6	0.566	154.8	0.964	1.31

V_{CE} = 2 V, I_C = 5 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.788	–50.0	13.704	148.5	0.044	66.6	0.867	–26.7	0.125	24.95
0.2	0.709	–87.1	10.767	126.5	0.068	51.1	0.670	–43.4	0.261	21.98
0.3	0.640	–111.7	8.250	113.1	0.080	43.6	0.523	–52.5	0.396	20.12
0.4	0.618	–128.2	6.620	104.1	0.087	41.0	0.427	–57.6	0.497	18.82
0.5	0.599	–140.8	5.486	96.8	0.092	40.3	0.360	–60.8	0.604	17.76
0.6	0.589	–149.4	4.652	91.2	0.097	40.7	0.313	–63.3	0.703	16.83
0.7	0.585	–157.0	4.030	86.4	0.102	41.7	0.280	–65.3	0.785	15.99
0.8	0.583	–162.8	3.563	82.5	0.106	43.2	0.254	–67.3	0.860	15.28
0.9	0.583	–167.6	3.204	78.7	0.111	44.8	0.234	–69.6	0.922	14.62
1.0	0.587	–172.2	2.915	75.2	0.116	46.4	0.218	–72.1	0.964	14.00
1.1	0.589	–176.0	2.669	72.0	0.121	47.8	0.206	–74.8	1.008	12.89
1.2	0.591	–179.1	2.466	68.9	0.127	49.3	0.196	–78.1	1.042	11.63
1.3	0.592	177.7	2.289	66.2	0.134	50.7	0.188	–81.6	1.070	10.71
1.4	0.596	174.9	2.138	63.3	0.140	51.8	0.182	–85.7	1.090	9.99
1.5	0.597	172.0	2.008	60.8	0.148	53.1	0.179	–89.9	1.109	9.33
1.6	0.602	169.5	1.902	58.2	0.155	54.0	0.176	–94.6	1.111	8.86
1.7	0.608	167.1	1.803	55.9	0.163	54.8	0.176	–99.4	1.108	8.44
1.8	0.612	164.6	1.722	53.2	0.171	55.4	0.177	–104.8	1.106	8.05
1.9	0.612	162.0	1.640	50.8	0.179	55.8	0.178	–109.8	1.114	7.57
2.0	0.620	159.9	1.563	48.4	0.187	56.3	0.181	–114.9	1.106	7.23
2.1	0.625	157.7	1.500	46.0	0.196	56.5	0.184	–120.1	1.102	6.91
2.2	0.632	155.8	1.439	44.0	0.204	56.4	0.190	–125.3	1.089	6.66
2.3	0.642	154.2	1.385	41.9	0.213	56.7	0.196	–130.0	1.069	6.51
2.4	0.647	152.1	1.337	40.1	0.223	56.7	0.202	–134.6	1.063	6.26
2.5	0.656	150.4	1.290	38.1	0.231	56.5	0.209	–139.2	1.047	6.14
2.6	0.659	148.8	1.242	36.1	0.240	56.6	0.218	–143.4	1.046	5.82
2.7	0.669	147.4	1.203	34.4	0.249	56.4	0.227	–147.7	1.028	5.82
2.8	0.672	146.2	1.163	32.7	0.258	56.5	0.236	–151.3	1.025	5.56
2.9	0.680	144.7	1.143	30.9	0.267	56.1	0.245	–154.8	1.000	6.30
3.0	0.686	143.6	1.107	30.1	0.277	55.9	0.252	–158.9	0.996	6.02
4.0	0.718	132.4	0.865	17.1	0.380	48.5	0.378	171.1	0.940	3.57
5.0	0.753	122.4	0.711	11.0	0.448	39.4	0.501	150.5	0.946	2.01

V_{CE} = 2 V, I_C = 7 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.737	–59.3	17.355	143.4	0.041	62.9	0.813	–33.3	0.174	26.29
0.2	0.642	–99.2	12.698	121.0	0.060	49.6	0.584	–52.2	0.340	23.27
0.3	0.590	–123.0	9.423	108.6	0.069	45.0	0.437	–61.7	0.491	21.33
0.4	0.572	–138.0	7.414	100.4	0.076	44.8	0.346	–67.5	0.612	19.90
0.5	0.563	–149.1	6.089	93.9	0.082	45.4	0.286	–71.4	0.716	18.70
0.6	0.558	–156.9	5.136	88.9	0.088	46.9	0.244	–74.5	0.806	17.65
0.7	0.559	–163.5	4.432	84.7	0.095	48.5	0.213	–77.6	0.874	16.69
0.8	0.557	–168.4	3.912	81.1	0.101	50.2	0.190	–80.8	0.937	15.87
0.9	0.561	–172.7	3.509	77.7	0.109	51.8	0.173	–84.0	0.976	15.09
1.0	0.566	–176.6	3.184	74.6	0.116	53.1	0.159	–87.7	1.006	13.91
1.1	0.567	–179.7	2.909	71.6	0.123	54.2	0.149	–91.5	1.037	12.55
1.2	0.568	177.3	2.686	68.7	0.131	55.2	0.141	–96.1	1.060	11.61
1.3	0.572	174.6	2.493	66.3	0.139	55.9	0.135	–101.0	1.073	10.88
1.4	0.578	171.8	2.325	63.5	0.148	56.6	0.131	–106.3	1.080	10.25
1.5	0.577	169.2	2.181	61.2	0.156	57.2	0.130	–111.4	1.094	9.58
1.6	0.580	166.9	2.068	58.7	0.165	57.5	0.131	–116.8	1.094	9.10
1.7	0.589	165.0	1.955	56.5	0.174	57.7	0.133	–122.1	1.086	8.70
1.8	0.592	162.6	1.869	54.0	0.183	57.7	0.137	–127.8	1.084	8.32
1.9	0.594	159.9	1.779	51.6	0.192	57.6	0.142	–132.8	1.088	7.86
2.0	0.600	158.3	1.697	49.2	0.201	57.5	0.147	–137.6	1.084	7.51
2.1	0.609	156.5	1.625	47.1	0.209	57.3	0.154	–142.6	1.074	7.24
2.2	0.614	154.4	1.557	45.1	0.218	56.8	0.161	–147.2	1.071	6.90
2.3	0.625	153.0	1.499	43.3	0.228	56.7	0.169	–151.5	1.053	6.78
2.4	0.628	151.0	1.449	41.5	0.236	56.3	0.177	–155.5	1.051	6.50
2.5	0.636	149.3	1.395	39.6	0.245	55.9	0.185	–159.3	1.045	6.26
2.6	0.642	148.0	1.347	37.6	0.253	55.7	0.195	–162.5	1.038	6.06
2.7	0.649	146.7	1.302	35.8	0.262	55.3	0.204	–166.0	1.030	5.91
2.8	0.654	145.6	1.259	34.1	0.270	55.1	0.214	–169.0	1.027	5.67
2.9	0.663	144.1	1.238	32.4	0.279	54.6	0.223	–171.7	1.005	6.05
3.0	0.667	142.9	1.202	31.3	0.288	54.3	0.230	–174.9	1.004	5.83
4.0	0.702	132.6	0.943	18.1	0.381	46.5	0.351	162.2	0.955	3.93
5.0	0.744	122.9	0.777	10.7	0.443	38.3	0.470	145.8	0.947	2.44

V_{CE} = 2 V, I_C = 10 mA, Z_O = 50 Ω

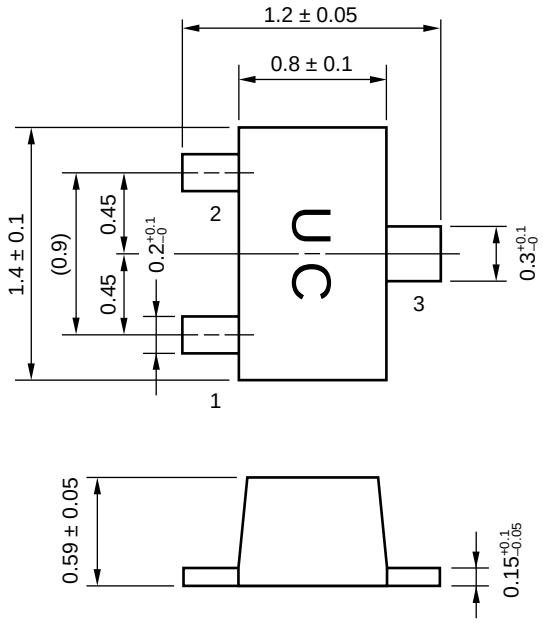
Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.653	–70.4	21.298	137.6	0.038	59.7	0.745	–41.3	0.254	27.52
0.2	0.584	–111.9	14.486	115.6	0.052	50.0	0.497	–61.8	0.435	24.48
0.3	0.549	–133.8	10.409	104.6	0.060	48.2	0.359	–72.4	0.602	22.39
0.4	0.541	–147.3	8.116	97.2	0.067	49.5	0.279	–79.5	0.723	20.81
0.5	0.533	–156.9	6.594	91.6	0.075	51.6	0.227	–85.0	0.823	19.43
0.6	0.534	–163.7	5.535	87.1	0.083	53.5	0.191	–90.1	0.893	18.23
0.7	0.538	–168.9	4.771	83.2	0.092	55.2	0.166	–95.2	0.942	17.16
0.8	0.537	–172.9	4.201	80.0	0.100	56.6	0.147	–100.5	0.986	16.23
0.9	0.540	–176.9	3.761	77.0	0.109	57.9	0.134	–106.0	1.016	14.61
1.0	0.546	179.8	3.410	74.0	0.118	58.7	0.124	–111.8	1.032	13.53
1.1	0.548	176.7	3.117	71.2	0.127	59.3	0.117	–117.6	1.049	12.54
1.2	0.554	174.0	2.875	68.5	0.136	59.7	0.114	–123.7	1.057	11.79
1.3	0.556	171.8	2.665	66.2	0.146	60.0	0.112	–129.9	1.067	11.04
1.4	0.560	169.5	2.487	63.6	0.155	60.0	0.113	–135.9	1.071	10.42
1.5	0.561	167.1	2.330	61.4	0.165	60.2	0.115	–141.0	1.080	9.79
1.6	0.566	165.0	2.206	59.2	0.174	60.0	0.120	–145.9	1.075	9.35
1.7	0.572	163.0	2.085	56.9	0.184	59.8	0.125	–150.5	1.072	8.90
1.8	0.576	160.9	1.991	54.6	0.194	59.3	0.132	–154.9	1.068	8.53
1.9	0.578	158.3	1.894	52.4	0.203	58.8	0.139	–159.0	1.072	8.06
2.0	0.583	156.7	1.805	50.2	0.212	58.3	0.147	–162.6	1.071	7.68
2.1	0.592	154.8	1.732	48.2	0.221	57.9	0.155	–166.3	1.062	7.42
2.2	0.600	152.9	1.658	46.2	0.230	57.1	0.164	–169.7	1.057	7.12
2.3	0.608	151.7	1.597	44.3	0.239	56.7	0.173	–172.8	1.047	6.92
2.4	0.613	149.9	1.539	42.7	0.248	56.1	0.182	–175.6	1.044	6.63
2.5	0.622	148.4	1.482	40.8	0.257	55.4	0.191	–178.5	1.037	6.44
2.6	0.629	147.3	1.434	39.0	0.265	55.0	0.200	179.3	1.030	6.27
2.7	0.634	145.8	1.386	37.0	0.273	54.5	0.209	176.6	1.029	6.01
2.8	0.639	144.8	1.340	35.5	0.281	54.1	0.218	174.4	1.026	5.78
2.9	0.650	143.3	1.319	33.8	0.290	53.6	0.228	172.5	1.006	6.12
3.0	0.653	142.5	1.280	32.9	0.298	53.1	0.235	169.8	1.008	5.80
4.0	0.688	132.6	1.006	19.4	0.384	44.9	0.344	153.1	0.971	4.18
5.0	0.734	123.3	0.832	11.1	0.439	37.1	0.453	140.5	0.954	2.78

V_{CE} = 2 V, I_C = 20 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.525	–97.5	28.158	126.6	0.028	58.5	0.598	–58.1	0.393	29.97
0.2	0.506	–135.7	17.032	107.1	0.039	55.5	0.361	–82.0	0.647	26.37
0.3	0.499	–152.4	11.795	98.3	0.049	57.5	0.257	–96.4	0.803	23.80
0.4	0.501	–162.3	9.012	92.6	0.059	60.9	0.203	–107.4	0.895	21.84
0.5	0.505	–168.5	7.269	88.0	0.069	62.8	0.171	–117.4	0.951	20.21
0.6	0.508	–173.5	6.090	84.4	0.080	64.2	0.152	–126.8	0.986	18.82
0.7	0.513	–177.1	5.210	81.1	0.091	64.9	0.141	–135.6	1.011	16.94
0.8	0.515	179.5	4.595	78.4	0.101	65.5	0.134	–143.7	1.029	15.52
0.9	0.518	176.7	4.105	75.7	0.112	65.9	0.132	–150.9	1.040	14.41
1.0	0.527	174.0	3.717	73.1	0.123	65.7	0.132	–157.4	1.040	13.56
1.1	0.527	171.8	3.394	70.7	0.134	65.5	0.133	–162.9	1.050	12.67
1.2	0.531	169.9	3.127	68.2	0.145	65.2	0.136	–168.0	1.052	11.95
1.3	0.534	167.6	2.894	66.1	0.156	64.8	0.141	–172.5	1.056	11.24
1.4	0.541	165.7	2.702	63.6	0.166	64.2	0.147	–176.2	1.053	10.69
1.5	0.545	163.5	2.530	61.6	0.177	63.7	0.152	–179.0	1.054	10.12
1.6	0.548	161.9	2.390	59.6	0.188	63.0	0.159	178.4	1.052	9.64
1.7	0.553	160.2	2.261	57.6	0.199	62.2	0.166	176.1	1.050	9.19
1.8	0.558	158.4	2.153	55.4	0.209	61.4	0.175	174.0	1.047	8.81
1.9	0.560	156.0	2.053	53.3	0.218	60.4	0.183	171.9	1.049	8.38
2.0	0.568	154.4	1.954	51.4	0.228	59.5	0.192	169.9	1.046	8.02
2.1	0.576	152.5	1.874	49.4	0.237	58.5	0.201	167.8	1.041	7.74
2.2	0.582	151.2	1.790	47.7	0.246	57.5	0.210	165.8	1.041	7.37
2.3	0.592	149.9	1.724	45.8	0.256	56.7	0.219	164.0	1.033	7.18
2.4	0.597	148.3	1.663	44.2	0.265	55.9	0.228	162.2	1.029	6.92
2.5	0.606	147.0	1.603	42.4	0.273	55.0	0.237	160.3	1.026	6.70
2.6	0.613	145.8	1.543	40.7	0.282	54.3	0.245	158.8	1.023	6.46
2.7	0.617	144.5	1.494	38.9	0.289	53.5	0.254	156.9	1.024	6.19
2.8	0.622	143.8	1.447	37.5	0.298	52.9	0.262	155.2	1.022	5.96
2.9	0.632	142.4	1.419	35.6	0.306	52.3	0.270	154.2	1.008	6.11
3.0	0.637	141.5	1.383	34.8	0.313	51.7	0.276	152.0	1.007	5.92
4.0	0.671	132.3	1.090	21.7	0.391	42.6	0.363	140.2	0.988	4.45
5.0	0.719	123.6	0.913	13.2	0.439	35.4	0.451	131.6	0.970	3.18

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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