

2SC5907

Silicon NPN Epitaxial
VHF/UHF wide band amplifier

RENESAS

ADE-208-1603 (Z)

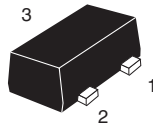
Rev.0
Oct. 2002

Features

- Super compact package: MFPAK (1.4 x 0.8 x 0.59 mm)

Outline

MFPAK



1. Emitter
2. Base
3. Collector

Note: Marking is "WK-".

Absolute Maximum Ratings

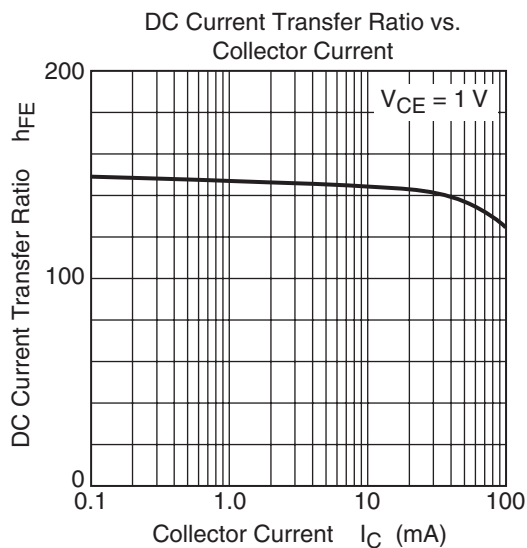
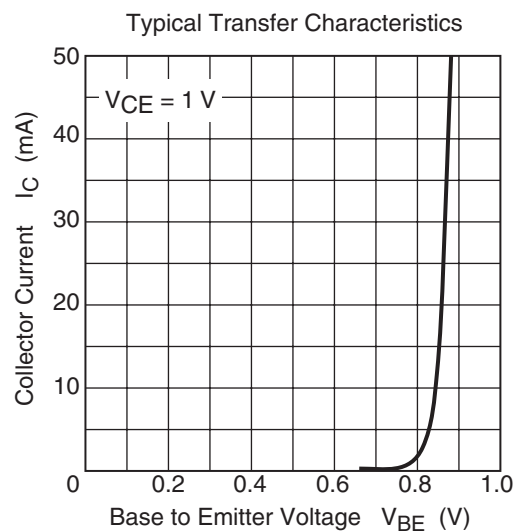
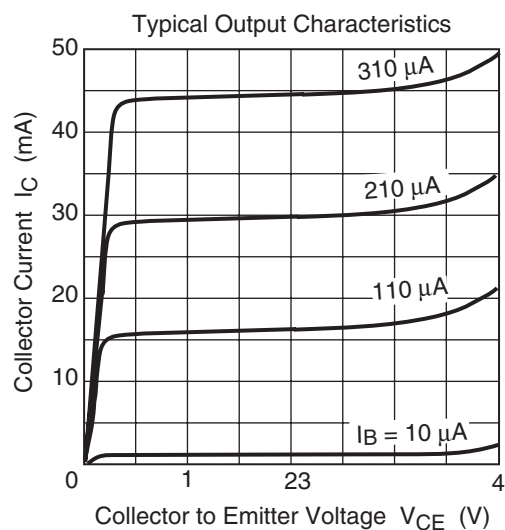
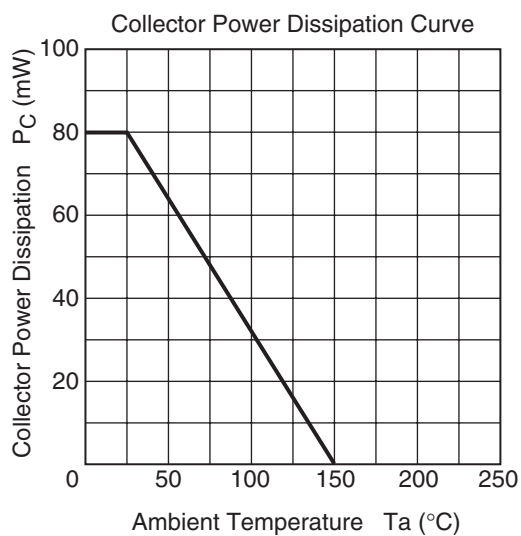
(Ta = 25°C)

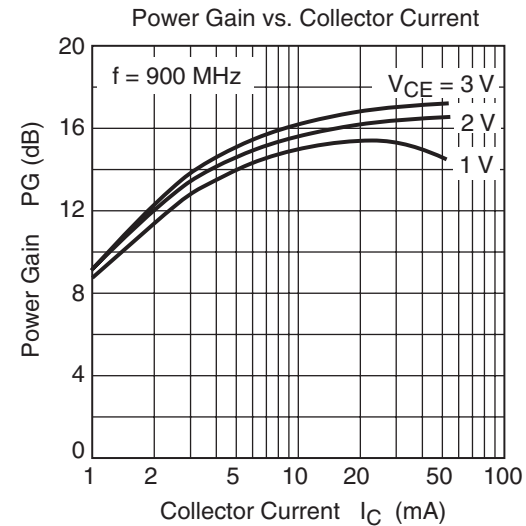
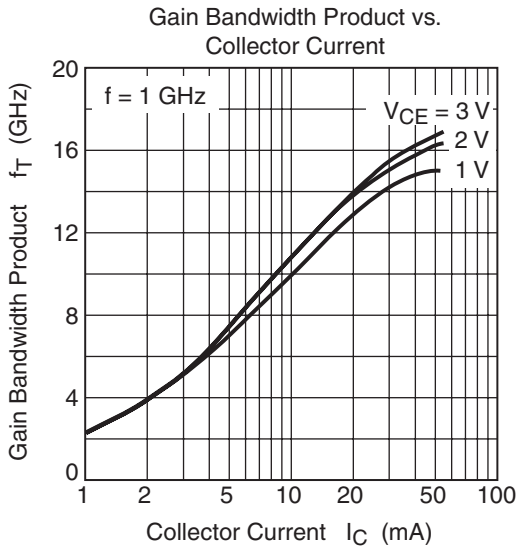
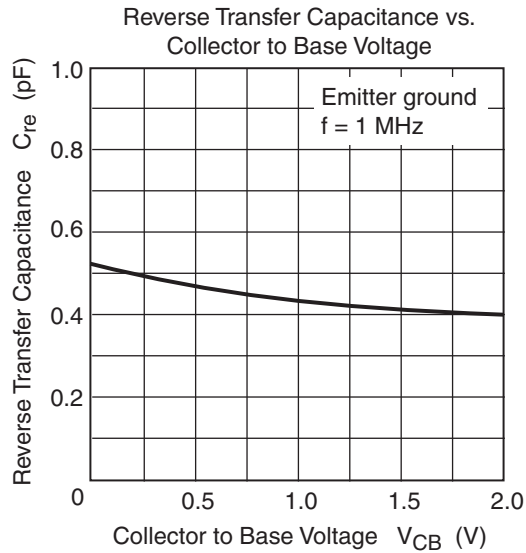
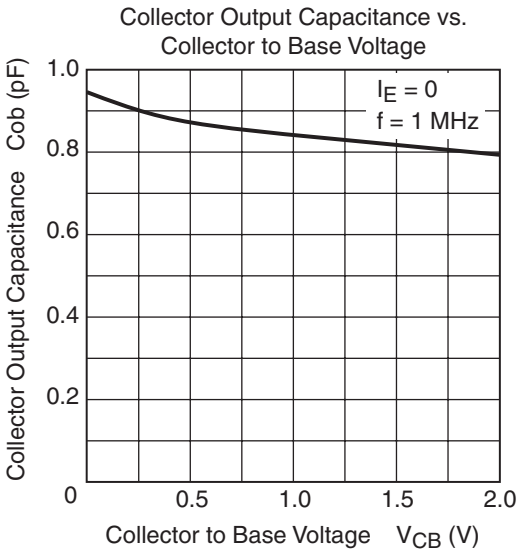
Item Symbol	Ratings		Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	4.0	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Collector power dissipation	P_C	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	-55 to 150	°C

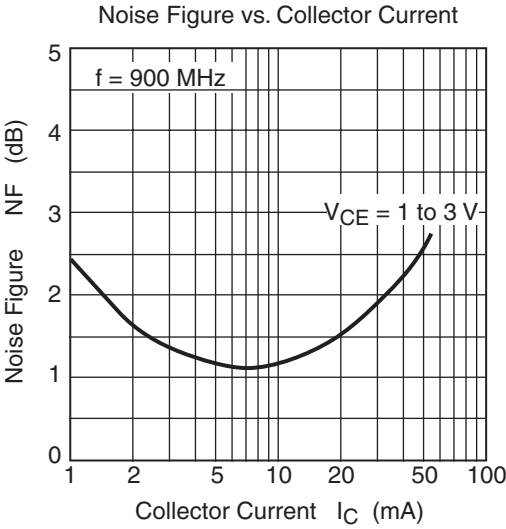
Electrical Characteristics

(Ta = 25°C)

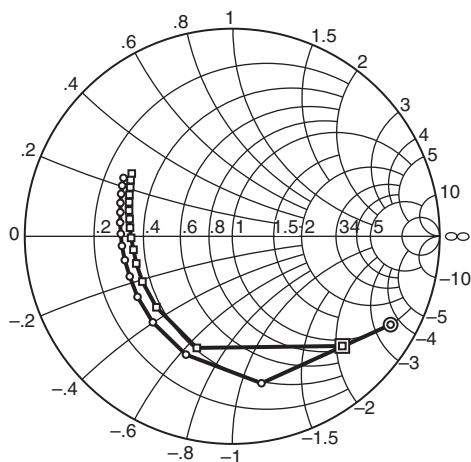
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector cutoff current	I_{CBO}	—	— 0.1	—	μA	$V_{CB} = 15 V, I_E = 0$
Collector cutoff current	I_{CEO}	—	— 1.0	—	μA	$V_{CE} = 3.5 V, R_{BE} = \text{Infinite}$
Emitter cutoff current	I_{EBO}	—	— 0.5	—	μA	$V_{EB} = 0.8 V, I_C = 0$
DC current transfer ratio	h_{FE}	120	140	170	—	$V_{CE} = 1 V, I_C = 5 mA$
Reverse transfer capacitance	C_{re}	— 0.45	—	—	pF	$V_{CB} = 1 V$, Emitter ground, $f = 1 MHz$
Collector output capacitance	C_{ob}	— 0.85	—	1.0	PF	$V_{CB} = 1 V, I_E = 0, f = 1 MHz$
Gain bandwidth product	$f_T(1)$	5.0	7.5	—	GHz	$V_{CE} = 1 V, I_C = 5 mA$ $f = 1 GHz$
Gain bandwidth product	$f_T(2)$	— 15.0	—	—	GHz	$V_{CE} = 1 V, I_C = 40 mA$ $f = 1 GHz$
Power gain	PG	11.0	14.0	—	dB	$V_{CE} = 1 V, I_C = 5 mA$, $f = 900 MHz$
Noise figure	NF	— 1.2	—	1.8	dB	$V_{CE} = 1 V, I_C = 5 mA$, $f = 900 MHz$







S_{11} Parameter vs. Frequency

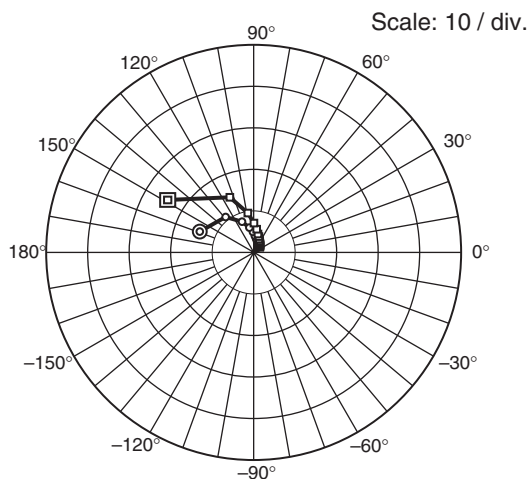


Test conditions: $V_{CE} = 1$ V, $Z_O = 50$ Ω
100 to 2900 MHz (200 MHz step)

○ ($I_C = 5$ mA)

□ ($I_C = 10$ mA)

S_{21} Parameter vs. Frequency

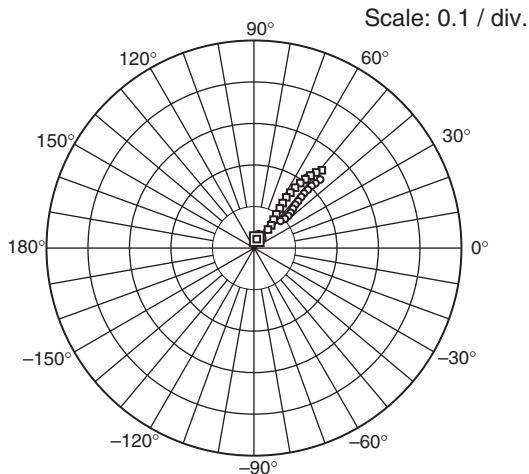


Test conditions: $V_{CE} = 1$ V, $Z_O = 50$ Ω
100 to 2900 MHz (200 MHz step)

○ ($I_C = 5$ mA)

□ ($I_C = 10$ mA)

S_{12} Parameter vs. Frequency

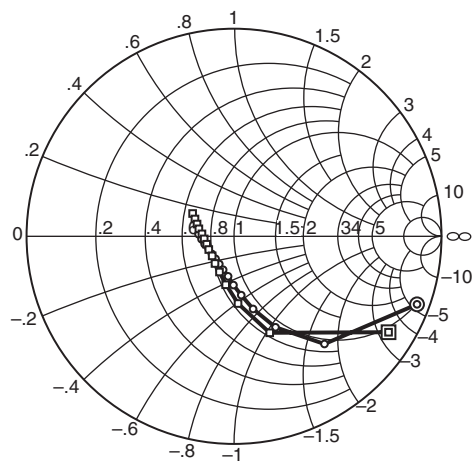


Test conditions: $V_{CE} = 1$ V, $Z_O = 50$ Ω
100 to 2900 MHz (200 MHz step)

○ ($I_C = 5$ mA)

□ ($I_C = 10$ mA)

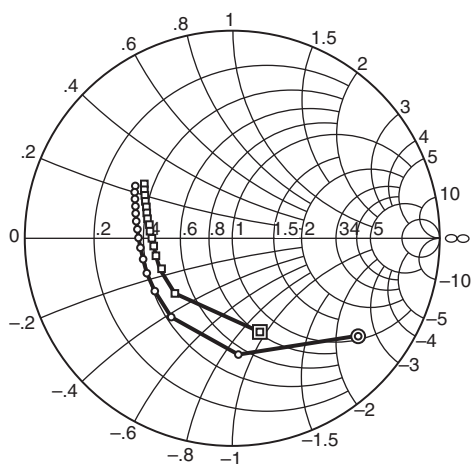
S_{22} Parameter vs. Frequency



Test conditions: $V_{CE} = 1$ V, $Z_O = 50$ Ω
100 to 2900 MHz (200 MHz step)

○ ($I_C = 5$ mA)

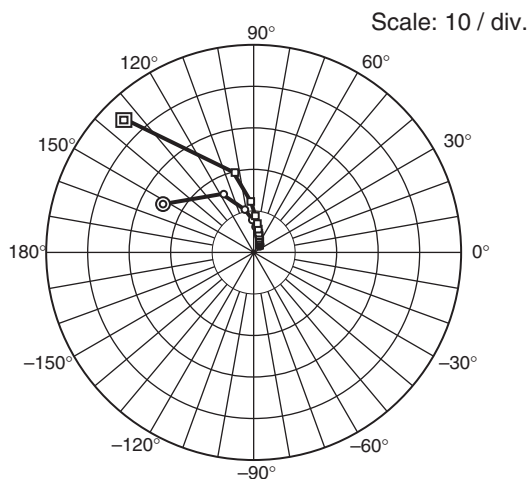
□ ($I_C = 10$ mA)

S_{11} Parameter vs. Frequency

Test conditions: $V_{CE} = 3$ V, $Z_O = 50$ Ω
 100 to 2900 MHz (200 MHz step)

⊙— ($I_C = 10$ mA)

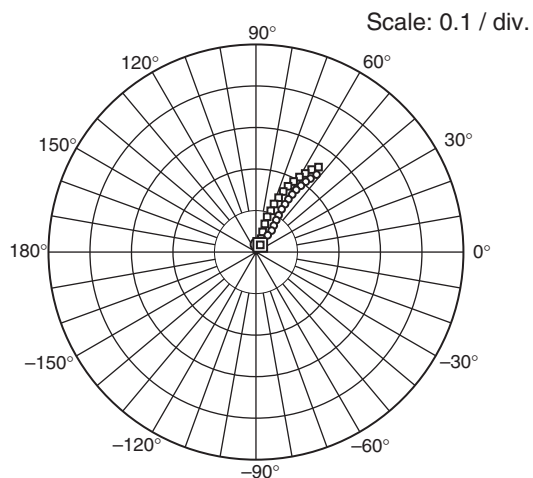
⊠— ($I_C = 30$ mA)

 S_{21} Parameter vs. Frequency

Test conditions: $V_{CE} = 3$ V, $Z_O = 50$ Ω
 100 to 2900 MHz (200 MHz step)

⊙— ($I_C = 10$ mA)

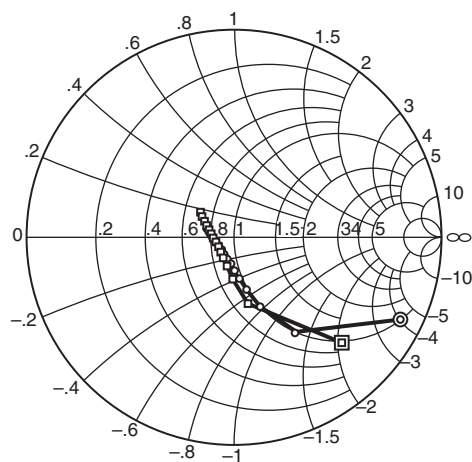
⊠— ($I_C = 30$ mA)

 S_{12} Parameter vs. Frequency

Test conditions: $V_{CE} = 3$ V, $Z_O = 50$ Ω
 100 to 2900 MHz (200 MHz step)

⊙— ($I_C = 10$ mA)

⊠— ($I_C = 30$ mA)

 S_{22} Parameter vs. Frequency

Test conditions: $V_{CE} = 3$ V, $Z_O = 50$ Ω
 100 to 2900 MHz (200 MHz step)

⊙— ($I_C = 10$ mA)

⊠— ($I_C = 30$ mA)

S Parameter

(V_{CE} = 1 V, I_C = 5 mA, Z_o = 50 Ω)

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.874	-29.1	14.076	159.0	0.028	73.4	-20.2
200	0.793	-55.7	12.398	141.0	0.056	63.5	-37.2
300	0.718	-78.8	10.717	127.6	0.075	55.3	-49.8
400	0.655	-97.0	9.170	117.3	0.084	49.8	-58.7
500	0.611	-111.5	7.878	109.4	0.092	46.8	-65.3
600	0.583	-123.4	6.880	103.0	0.098	45.4	-70.9
700	0.563	-132.9	6.054	97.9	0.103	44.3	-75.1
800	0.551	-140.8	5.410	93.5	0.108	44.3	-79.6
900	0.542	-147.6	4.873	89.6	0.115	44.1	-82.8
1000	0.534	-153.5	4.439	86.1	0.119	44.7	-86.6
1100	0.532	-158.8	4.074	82.8	0.123	44.8	-90.5
1200	0.530	-163.6	3.762	79.8	0.130	45.5	-94.5
1300	0.530	-167.7	3.492	77.0	0.135	46.0	-98.3
1400	0.530	-171.5	3.267	74.3	0.140	46.6	-102.9
1500	0.533	-175.2	3.063	71.8	0.146	47.0	-108.0
1600	0.536	-178.4	2.886	69.3	0.151	47.2	-113.3
1700	0.538	178.6	2.728	67.0	0.156	47.3	-118.1
1800	0.541	175.7	2.588	64.7	0.163	47.5	-123.9
1900	0.545	172.9	2.466	62.4	0.168	47.8	-129.7
2000	0.549	170.4	2.353	60.2	0.174	47.9	-135.9
2100	0.553	167.8	2.249	58.0	0.181	48.0	-142.0
2200	0.558	165.5	2.154	56.0	0.187	47.9	-148.6
2300	0.564	163.3	2.071	54.0	0.193	47.7	-154.8
2400	0.569	161.2	1.989	52.0	0.199	47.7	-159.8
2500	0.574	159.0	1.918	50.0	0.205	47.7	-165.7
2600	0.581	157.2	1.848	48.1	0.212	47.4	-170.3
2700	0.586	155.2	1.784	46.2	0.217	46.9	-175.6
2800	0.592	153.3	1.725	44.4	0.224	46.9	-179.5
2900	0.595	151.7	1.664	42.7	0.231	46.4	175.9
3000	0.602	150.5	1.618	41.5	0.236	46.2	172.5
3100	0.620	148.6	1.593	39.7	0.243	45.6	168.7
3200	0.626	146.5	1.549	37.3	0.249	45.2	166.1
3300	0.631	144.4	1.504	35.2	0.255	44.8	162.8
3400	0.630	142.6	1.445	33.3	0.262	44.1	160.3
3500	0.634	141.5	1.401	32.1	0.267	43.6	157.4
3600	0.642	140.2	1.368	30.7	0.273	43.1	154.9
3700	0.650	138.8	1.334	29.1	0.278	42.5	152.5
3800	0.656	137.3	1.300	27.6	0.284	42.1	150.3
3900	0.662	135.9	1.266	26.1	0.290	41.2	148.3
4000	0.667	134.4	1.234	24.7	0.295	40.8	146.1

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

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.745	-45.0	24.250	149.0	0.022	68.5	-32.2
200	0.634	-82.5	18.902	127.2	0.045	57.5	-55.0
300	0.563	-108.0	14.610	113.9	0.058	53.1	-69.8
400	0.524	-125.0	11.639	105.3	0.064	53.1	-79.2
500	0.503	-137.3	9.581	99.3	0.070	53.0	-86.8
600	0.493	-146.5	8.142	94.5	0.076	54.0	-94.0
700	0.487	-153.6	7.049	90.7	0.085	55.4	-100.1
800	0.484	-159.3	6.224	87.2	0.092	55.9	-106.4
900	0.484	-164.5	5.561	84.2	0.101	56.5	-112.6
1000	0.482	-168.8	5.036	81.4	0.109	57.0	-118.8
1100	0.483	-172.5	4.600	78.8	0.116	56.9	-125.5
1200	0.485	-176.2	4.231	76.3	0.124	57.5	-132.4
1300	0.489	-179.3	3.913	73.9	0.132	57.5	-138.7
1400	0.492	177.9	3.654	71.7	0.140	57.4	-145.5
1500	0.497	175.0	3.418	69.5	0.148	57.5	-152.8
1600	0.502	172.5	3.214	67.4	0.155	56.9	-158.7
1700	0.506	170.3	3.032	65.4	0.163	56.7	-164.2
1800	0.510	168.1	2.872	63.4	0.171	56.2	-169.8
1900	0.515	165.9	2.732	61.4	0.179	55.8	-175.3
2000	0.520	163.8	2.603	59.4	0.186	55.1	-180.0
2100	0.526	161.7	2.485	57.5	0.194	54.6	175.5
2200	0.532	159.8	2.377	55.7	0.201	54.2	171.6
2300	0.538	158.0	2.282	53.9	0.209	53.3	167.9
2400	0.545	156.2	2.190	52.0	0.217	52.7	165.0
2500	0.551	154.4	2.109	50.2	0.223	52.1	161.6
2600	0.557	152.8	2.030	48.5	0.232	51.4	159.1
2700	0.564	151.1	1.958	46.8	0.238	50.6	156.1
2800	0.568	149.5	1.890	45.1	0.245	50.0	153.9
2900	0.574	148.1	1.822	43.6	0.252	49.0	151.2
3000	0.582	147.1	1.771	42.5	0.259	48.3	149.3
3100	0.599	145.5	1.741	40.9	0.265	47.6	147.1
3200	0.606	143.4	1.692	38.6	0.271	46.5	145.4
3300	0.611	141.5	1.642	36.7	0.278	45.9	143.4
3400	0.611	139.8	1.576	34.9	0.283	45.1	141.8
3500	0.615	139.1	1.527	33.8	0.289	44.2	139.9
3600	0.623	137.8	1.491	32.5	0.295	43.3	138.2
3700	0.632	136.5	1.454	31.0	0.301	42.5	136.6
3800	0.638	135.1	1.416	29.6	0.306	41.7	134.9
3900	0.644	133.8	1.379	28.2	0.311	40.7	133.4
4000	0.650	132.4	1.343	26.9	0.316	40.1	132.0

(V_{CE} = 1 V, I_C = 20 mA, Z_O = 50 Ω)

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.572	-71.5	36.170	136.2	0.020	71.8	-48.0
200	0.492	-113.8	23.674	114.2	0.035	58.0	-74.5
300	0.465	-135.6	16.826	103.7	0.044	58.3	-90.6
400	0.454	-148.2	12.929	97.4	0.053	62.4	-101.5
500	0.451	-156.9	10.457	92.9	0.060	64.7	-111.6
600	0.451	-163.2	8.789	89.2	0.070	64.6	-120.8
700	0.452	-168.1	7.565	86.2	0.080	65.4	-129.2
800	0.454	-172.0	6.648	83.4	0.089	66.0	-136.9
900	0.456	-175.8	5.925	80.9	0.098	65.8	-144.3
1000	0.458	-178.9	5.353	78.6	0.107	65.1	-151.6
1100	0.461	178.4	4.880	76.3	0.116	65.1	-158.1
1200	0.466	175.7	4.483	74.2	0.125	64.8	-164.0
1300	0.471	173.4	4.142	72.1	0.135	63.9	-169.7
1400	0.474	171.1	3.861	70.1	0.145	63.6	-174.8
1500	0.480	168.8	3.609	68.2	0.153	62.9	-179.9
1600	0.487	166.8	3.390	66.2	0.162	62.1	176.2
1700	0.491	165.1	3.195	64.4	0.170	61.2	172.1
1800	0.496	163.2	3.025	62.6	0.179	60.6	168.4
1900	0.502	161.4	2.875	60.7	0.188	59.7	165.1
2000	0.507	159.6	2.737	58.9	0.196	58.8	162.2
2100	0.513	157.7	2.611	57.1	0.205	57.9	159.3
2200	0.520	156.2	2.495	55.4	0.214	57.0	156.6
2300	0.526	154.6	2.395	53.7	0.222	55.8	154.2
2400	0.534	153.1	2.295	52.0	0.229	54.9	152.1
2500	0.539	151.4	2.210	50.3	0.237	54.0	149.8
2600	0.547	150.0	2.126	48.7	0.244	53.2	148.0
2700	0.553	148.5	2.049	47.1	0.251	52.2	145.9
2800	0.559	147.0	1.977	45.5	0.259	51.1	144.2
2900	0.564	145.8	1.904	44.1	0.266	50.1	142.2
3000	0.573	144.9	1.849	43.1	0.273	49.1	140.6
3100	0.589	143.4	1.817	41.5	0.279	48.2	138.9
3200	0.597	141.5	1.765	39.4	0.286	47.1	137.5
3300	0.602	139.7	1.713	37.5	0.292	46.3	135.8
3400	0.603	138.1	1.643	35.8	0.298	45.1	134.5
3500	0.608	137.3	1.591	34.8	0.303	44.3	133.0
3600	0.616	136.2	1.553	33.5	0.309	43.2	131.3
3700	0.624	134.9	1.513	32.2	0.314	42.4	130.0
3800	0.630	133.6	1.473	30.8	0.319	41.4	128.5
3900	0.637	132.4	1.434	29.5	0.323	40.3	127.2
4000	0.643	131.1	1.398	28.2	0.328	39.6	125.8

($V_{CE} = 1\text{ V}$, $I_C = 30\text{ mA}$, $Z_O = 50\ \Omega$)

f (MHz)	S11		S21 S12 S22					
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.485	-93.3	41.381	128.6	0.019	75.1	0.660	-57.3
200	0.448	-131.3	25.084	108.6	0.029	62.5	0.409	-85.3
300	0.441	-148.8	17.402	99.8	0.040	64.3	0.302	-102.3
400	0.439	-158.4	13.249	94.4	0.050	68.1	0.245	-115.1
500	0.441	-165.1	10.669	90.5	0.060	68.7	0.212	-125.7
600	0.442	-170.0	8.943	87.2	0.069	68.9	0.194	-135.6
700	0.446	-173.9	7.687	84.5	0.079	69.2	0.182	-144.0
800	0.449	-177.2	6.748	82.0	0.089	69.7	0.178	-151.3
900	0.452	-179.7	6.009	79.7	0.099	68.9	0.173	-158.2
1000	0.454	-177.2	5.426	77.5	0.109	68.1	0.172	-164.3
1100	0.459	-174.9	4.945	75.4	0.118	67.8	0.174	-169.9
1200	0.463	-172.3	4.540	73.3	0.128	67.1	0.176	-175.3
1300	0.469	-170.3	4.193	71.4	0.138	66.4	0.178	-179.6
1400	0.472	-168.3	3.909	69.4	0.147	65.8	0.185	-176.1
1500	0.478	-166.4	3.651	67.6	0.157	64.9	0.190	-172.3
1600	0.484	-164.5	3.429	65.7	0.165	63.6	0.197	-169.1
1700	0.489	-163.0	3.230	64.0	0.174	62.9	0.203	-165.5
1800	0.495	-161.2	3.057	62.2	0.183	61.9	0.210	-162.7
1900	0.501	-159.5	2.906	60.4	0.193	60.8	0.217	-160.0
2000	0.506	-157.9	2.765	58.6	0.201	59.8	0.224	-157.3
2100	0.512	-156.2	2.636	56.9	0.210	58.8	0.234	-154.9
2200	0.519	-154.7	2.520	55.3	0.218	57.7	0.242	-152.6
2300	0.526	-153.2	2.418	53.6	0.226	56.5	0.251	-150.6
2400	0.533	-151.7	2.317	51.9	0.235	55.5	0.260	-148.7
2500	0.539	-150.2	2.230	50.2	0.242	54.5	0.270	-146.6
2600	0.547	-148.8	2.144	48.7	0.250	53.6	0.278	-144.8
2700	0.553	-147.4	2.066	47.1	0.257	52.5	0.289	-143.0
2800	0.559	-145.9	1.994	45.6	0.264	51.4	0.298	-141.4
2900	0.563	-144.7	1.919	44.2	0.272	50.1	0.308	-139.5
3000	0.572	-144.0	1.863	43.2	0.278	49.2	0.318	-138.0
3100	0.589	-142.4	1.832	41.7	0.285	48.2	0.328	-136.4
3200	0.596	-140.6	1.779	39.6	0.291	47.1	0.336	-135.1
3300	0.602	-138.8	1.725	37.7	0.297	46.3	0.347	-133.4
3400	0.602	-137.3	1.654	36.0	0.303	45.2	0.357	-132.2
3500	0.608	-136.5	1.603	35.1	0.309	44.2	0.367	-130.8
3600	0.615	-135.5	1.562	33.8	0.315	43.1	0.376	-129.3
3700	0.624	-134.2	1.523	32.5	0.320	42.0	0.385	-127.9
3800	0.630	-132.9	1.483	31.1	0.324	41.2	0.394	-126.4
3900	0.637	-131.7	1.443	29.9	0.329	40.0	0.403	-125.3
4000	0.642	-130.4	1.406	28.6	0.333	39.2	0.411	-124.0

($V_{CE} = 1\text{ V}$, $I_C = 40\text{ mA}$, $Z_o = 50\ \Omega$)

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.447	-110.0	43.022	123.8	0.016	59.7	-63.4
200	0.434	-141.4	25.489	105.8	0.028	68.5	-92.8
300	0.434	-155.9	17.520	97.8	0.040	65.2	-110.7
400	0.436	-163.9	13.295	92.9	0.049	70.5	-123.6
500	0.439	-169.6	10.689	89.3	0.059	70.6	-134.9
600	0.443	-173.7	8.952	86.2	0.069	71.8	-144.2
700	0.447	-177.1	7.688	83.7	0.079	71.5	-152.2
800	0.450	-179.9	6.748	81.2	0.089	71.4	-158.8
900	0.454	177.5	6.006	79.0	0.100	70.7	-165.7
1000	0.456	174.9	5.423	76.9	0.109	69.7	-170.6
1100	0.461	172.8	4.939	74.8	0.120	68.8	-175.6
1200	0.465	170.6	4.536	72.9	0.130	68.4	179.8
1300	0.471	168.7	4.187	70.9	0.140	67.3	175.8
1400	0.475	166.9	3.904	69.1	0.149	66.5	172.1
1500	0.482	164.9	3.646	67.2	0.159	65.4	168.6
1600	0.487	163.2	3.422	65.4	0.168	64.4	165.7
1700	0.492	161.7	3.225	63.6	0.177	63.4	162.6
1800	0.497	160.1	3.051	61.9	0.187	62.4	160.0
1900	0.504	158.5	2.900	60.1	0.196	61.3	157.5
2000	0.509	156.9	2.759	58.4	0.204	60.2	154.9
2100	0.515	155.3	2.631	56.7	0.213	59.0	152.7
2200	0.522	153.8	2.514	55.1	0.222	58.0	150.7
2300	0.528	152.3	2.412	53.4	0.230	56.7	148.7
2400	0.536	151.0	2.311	51.8	0.238	55.7	146.9
2500	0.542	149.3	2.224	50.1	0.246	54.7	145.0
2600	0.549	148.1	2.138	48.6	0.253	53.6	143.3
2700	0.556	146.7	2.060	47.0	0.261	52.5	141.6
2800	0.562	145.2	1.988	45.5	0.267	51.6	140.0
2900	0.566	144.2	1.913	44.1	0.275	50.1	138.2
3000	0.574	143.3	1.858	43.2	0.282	49.1	136.7
3100	0.592	141.9	1.826	41.6	0.288	48.2	135.3
3200	0.598	140.0	1.773	39.6	0.294	47.0	133.9
3300	0.605	138.2	1.719	37.7	0.301	46.1	132.4
3400	0.605	136.7	1.649	36.0	0.307	44.9	131.1
3500	0.610	136.0	1.596	35.1	0.312	43.9	129.6
3600	0.618	134.9	1.557	33.9	0.318	42.7	128.1
3700	0.626	133.7	1.517	32.5	0.323	41.8	126.9
3800	0.633	132.3	1.476	31.2	0.327	40.8	125.5
3900	0.639	131.2	1.437	29.9	0.331	39.8	124.3
4000	0.645	130.0	1.400	28.7	0.337	38.9	123.0

$(V_{CE} = 3 \text{ V}, I_C = 5 \text{ mA}, Z_o = 50 \Omega)$

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.884	-25.2	14.180	160.9	0.023	73.7	-16.6
200	0.809	-49.5	12.718	144.1	0.048	66.8	-30.7
300	0.732	-70.7	11.212	131.0	0.065	58.5	-41.9
400	0.665	-88.3	9.750	120.7	0.075	54.1	-49.3
500	0.612	-102.7	8.476	112.7	0.083	49.6	-54.5
600	0.576	-114.8	7.464	106.2	0.088	47.4	-58.6
700	0.550	-124.8	6.604	100.9	0.093	47.3	-61.3
800	0.532	-133.1	5.922	96.4	0.099	47.5	-64.2
900	0.519	-140.6	5.351	92.4	0.103	47.4	-66.0
1000	0.508	-146.8	4.881	88.9	0.109	47.3	-68.0
1100	0.505	-152.3	4.487	85.6	0.113	48.2	-69.9
1200	0.499	-157.5	4.148	82.6	0.118	48.4	-71.7
1300	0.498	-162.1	3.854	79.7	0.123	48.9	-73.6
1400	0.497	-166.2	3.608	77.1	0.129	49.3	-76.2
1500	0.499	-170.2	3.385	74.5	0.134	49.6	-78.4
1600	0.500	-173.8	3.190	72.1	0.139	49.9	-81.2
1700	0.503	-176.9	3.016	69.8	0.143	50.4	-83.7
1800	0.506	-180.0	2.863	67.5	0.150	50.7	-87.0
1900	0.508	177.1	2.728	65.3	0.155	51.1	-90.5
2000	0.512	174.3	2.604	63.1	0.160	51.2	-94.3
2100	0.516	171.6	2.489	61.0	0.167	51.4	-99.2
2200	0.521	169.2	2.385	58.9	0.173	51.4	-104.6
2300	0.527	166.8	2.292	56.9	0.179	51.3	-110.9
2400	0.533	164.6	2.203	54.9	0.185	51.2	-116.7
2500	0.538	162.4	2.124	52.9	0.191	51.4	-123.9
2600	0.544	160.4	2.049	51.1	0.197	51.0	-130.4
2700	0.549	158.3	1.977	49.2	0.203	50.9	-138.4
2800	0.555	156.4	1.911	47.4	0.210	50.5	-144.9
2900	0.560	154.8	1.844	45.7	0.216	50.3	-152.6
3000	0.567	153.5	1.794	44.5	0.223	50.2	-158.7
3100	0.584	151.6	1.767	42.7	0.229	49.9	-165.3
3200	0.591	149.3	1.718	40.3	0.236	49.3	-170.0
3300	0.597	147.2	1.670	38.2	0.242	49.0	-176.0
3400	0.596	145.3	1.603	36.2	0.248	48.4	179.6
3500	0.601	144.3	1.555	35.0	0.254	47.7	175.4
3600	0.609	143.0	1.519	33.6	0.261	47.3	171.4
3700	0.618	141.4	1.481	32.0	0.267	46.7	167.7
3800	0.624	139.8	1.444	30.4	0.272	46.2	164.2
3900	0.631	138.5	1.406	28.8	0.278	45.5	161.2
4000	0.637	137.0	1.371	27.3	0.284	45.0	158.4

(V_{CE} = 3 V, I_C = 10 mA, Z_O = 50 Ω)

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.766	-38.1	24.687	152.1	0.018	76.6	-26.2
200	0.651	-71.9	19.931	131.0	0.039	62.6	-45.6
300	0.560	-96.5	15.796	117.5	0.050	57.2	-57.5
400	0.507	-114.4	12.749	108.5	0.059	56.5	-64.5
500	0.475	-127.4	10.568	102.1	0.065	55.6	-69.4
600	0.459	-137.5	9.018	97.1	0.071	56.8	-73.7
700	0.449	-145.5	7.828	93.1	0.078	57.4	-76.6
800	0.442	-152.0	6.923	89.7	0.084	58.4	-80.0
900	0.439	-157.7	6.196	86.6	0.093	58.7	-82.7
1000	0.437	-162.5	5.613	83.7	0.100	58.9	-85.6
1100	0.437	-166.8	5.133	81.1	0.106	59.3	-89.3
1200	0.437	-170.8	4.723	78.7	0.114	59.4	-92.9
1300	0.441	-174.2	4.373	76.3	0.122	59.9	-96.8
1400	0.441	-177.3	4.082	74.1	0.128	59.2	-101.9
1500	0.447	179.6	3.820	72.0	0.136	59.5	-107.5
1600	0.451	176.8	3.593	69.9	0.144	59.4	-113.8
1700	0.456	174.4	3.390	67.9	0.150	59.1	-120.4
1800	0.460	172.1	3.212	66.0	0.158	58.8	-127.7
1900	0.465	169.7	3.056	64.0	0.165	58.4	-135.8
2000	0.470	167.6	2.912	62.1	0.172	58.2	-144.1
2100	0.476	165.3	2.780	60.2	0.180	57.7	-152.9
2200	0.482	163.4	2.661	58.4	0.188	57.1	-160.3
2300	0.488	161.4	2.555	56.6	0.195	56.4	-167.9
2400	0.496	159.6	2.451	54.8	0.203	55.8	-173.8
2500	0.502	157.7	2.362	53.0	0.209	55.2	179.8
2600	0.509	156.1	2.274	51.3	0.216	54.7	175.3
2700	0.515	154.4	2.194	49.6	0.223	53.9	170.3
2800	0.521	152.7	2.118	47.9	0.230	53.4	166.7
2900	0.527	151.3	2.041	46.4	0.238	52.4	162.5
3000	0.535	150.3	1.984	45.4	0.244	51.9	159.6
3100	0.552	148.6	1.952	43.7	0.251	51.0	156.5
3200	0.560	146.5	1.896	41.5	0.257	50.3	154.3
3300	0.567	144.6	1.841	39.4	0.263	49.6	151.4
3400	0.567	142.9	1.768	37.6	0.270	48.6	149.5
3500	0.573	141.9	1.713	36.6	0.276	47.9	147.1
3600	0.581	140.8	1.672	35.2	0.283	47.0	144.9
3700	0.591	139.4	1.630	33.7	0.288	46.2	143.0
3800	0.597	138.0	1.588	32.2	0.293	45.5	141.0
3900	0.605	136.6	1.546	30.8	0.298	44.6	139.4
4000	0.612	135.3	1.507	29.5	0.304	44.0	137.7

($V_{CE} = 3\text{ V}$, $I_C = 20\text{ mA}$, $Z_O = 50\ \Omega$)

f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.584	-58.1	37.700	140.9	0.018	63.2	-37.8
200	0.477	-99.3	25.854	118.3	0.031	66.8	-59.8
300	0.428	-122.9	18.692	107.0	0.040	61.6	-72.0
400	0.407	-137.7	14.465	100.2	0.048	64.3	-78.7
500	0.397	-147.8	11.741	95.4	0.055	65.5	-84.3
600	0.395	-155.3	9.888	91.5	0.064	65.4	-89.6
700	0.394	-161.2	8.522	88.4	0.072	66.8	-94.3
800	0.394	-165.7	7.497	85.6	0.081	67.5	-99.8
900	0.396	-170.0	6.687	83.1	0.091	67.3	-104.7
1000	0.397	-173.5	6.043	80.7	0.098	67.1	-111.3
1100	0.401	-176.6	5.512	78.5	0.107	66.6	-117.9
1200	0.404	-179.7	5.066	76.4	0.116	66.4	-124.9
1300	0.408	177.6	4.681	74.4	0.125	65.9	-132.8
1400	0.412	175.3	4.366	72.4	0.133	65.7	-140.7
1500	0.418	172.9	4.082	70.5	0.142	65.0	-149.9
1600	0.424	170.8	3.835	68.6	0.150	64.1	-157.0
1700	0.430	168.8	3.615	66.8	0.158	63.7	-165.0
1800	0.434	166.9	3.423	65.1	0.166	62.8	-171.5
1900	0.440	165.0	3.254	63.3	0.174	62.1	-177.8
2000	0.446	163.2	3.098	61.5	0.183	61.5	176.6
2100	0.452	161.3	2.956	59.8	0.191	60.5	171.4
2200	0.459	159.6	2.826	58.1	0.199	59.8	167.2
2300	0.467	157.9	2.713	56.4	0.206	58.7	163.6
2400	0.474	156.4	2.601	54.8	0.214	57.8	160.5
2500	0.481	154.7	2.504	53.1	0.221	57.0	157.1
2600	0.488	153.3	2.409	51.5	0.230	56.2	154.9
2700	0.496	151.8	2.322	49.9	0.236	55.3	152.0
2800	0.502	150.2	2.242	48.3	0.243	54.4	149.8
2900	0.508	149.1	2.159	46.9	0.250	53.3	147.2
3000	0.517	148.2	2.097	46.0	0.257	52.5	145.5
3100	0.534	146.6	2.062	44.4	0.265	51.4	143.6
3200	0.542	144.6	2.004	42.3	0.271	50.6	142.1
3300	0.550	142.9	1.943	40.3	0.277	49.6	140.2
3400	0.550	141.3	1.865	38.5	0.283	48.7	138.7
3500	0.557	140.4	1.805	37.6	0.289	47.7	137.0
3600	0.566	139.4	1.761	36.3	0.295	46.7	135.4
3700	0.574	138.1	1.717	34.9	0.301	45.8	134.0
3800	0.582	136.7	1.672	33.5	0.306	44.9	132.2
3900	0.590	135.4	1.627	32.1	0.310	44.0	131.0
4000	0.596	134.2	1.585	30.8	0.316	43.1	129.5

($V_{CE} = 3\text{ V}$, $I_C = 30\text{ mA}$, $Z_o = 50\ \Omega$)

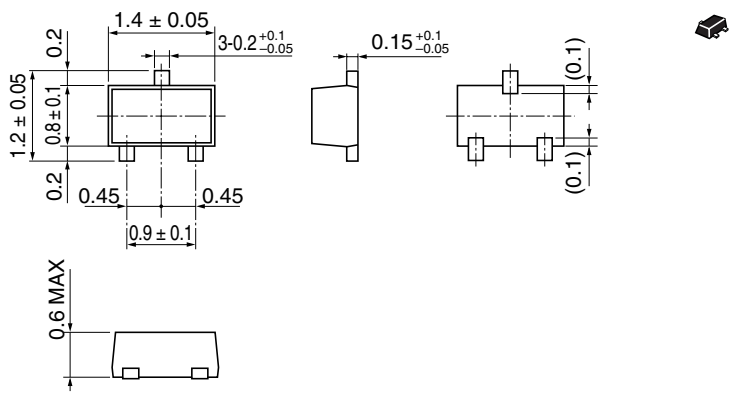
f (MHz)	S11		S21 S12 S22				
	MAG	ANG	MAG	ANG	MAG	ANG	
100	0.464	-73.7	44.556	134.3	0.021	59.3	-44.5
200	0.402	-115.2	27.999	112.7	0.026	66.6	-67.1
300	0.383	-136.8	19.642	103.0	0.036	65.3	-78.9
400	0.375	-148.6	15.027	97.0	0.045	70.0	-86.7
500	0.373	-157.4	12.123	92.9	0.052	69.5	-93.3
600	0.375	-163.1	10.186	89.5	0.063	71.2	-99.7
700	0.377	-167.8	8.757	86.7	0.072	70.9	-105.8
800	0.379	-171.6	7.697	84.2	0.081	71.0	-113.1
900	0.382	-175.0	6.856	81.8	0.091	71.1	-120.5
1000	0.383	-178.1	6.191	79.6	0.100	69.4	-127.4
1100	0.388	179.4	5.644	77.6	0.108	69.2	-134.9
1200	0.392	176.6	5.185	75.6	0.117	69.4	-143.5
1300	0.398	174.5	4.791	73.7	0.126	68.5	-151.2
1400	0.401	172.3	4.466	71.8	0.135	67.7	-159.1
1500	0.409	170.1	4.174	70.0	0.144	66.6	-167.4
1600	0.415	168.2	3.919	68.2	0.152	65.8	-173.0
1700	0.420	166.5	3.694	66.5	0.161	65.1	-179.2
1800	0.425	164.9	3.497	64.7	0.169	64.4	175.7
1900	0.431	163.0	3.323	63.0	0.179	63.4	170.8
2000	0.437	161.4	3.163	61.3	0.187	62.4	166.7
2100	0.444	159.5	3.018	59.6	0.195	61.4	163.0
2200	0.452	158.1	2.884	58.0	0.203	60.4	159.6
2300	0.459	156.6	2.768	56.4	0.211	59.4	156.9
2400	0.467	155.1	2.653	54.8	0.219	58.5	154.3
2500	0.474	153.5	2.553	53.1	0.226	57.5	151.7
2600	0.482	152.2	2.457	51.6	0.234	56.4	149.8
2700	0.489	150.8	2.367	50.0	0.241	55.6	147.4
2800	0.495	149.3	2.285	48.5	0.248	54.6	145.8
2900	0.502	148.0	2.199	47.1	0.256	53.3	143.6
3000	0.510	147.3	2.135	46.2	0.263	52.6	142.1
3100	0.528	145.8	2.100	44.7	0.269	51.5	139.9
3200	0.536	143.9	2.040	42.5	0.276	50.6	138.9
3300	0.543	142.2	1.978	40.6	0.282	49.6	137.1
3400	0.545	140.6	1.897	38.9	0.288	48.5	135.9
3500	0.552	139.8	1.837	38.0	0.294	47.6	134.1
3600	0.560	138.7	1.792	36.7	0.300	46.6	132.7
3700	0.569	137.5	1.746	35.4	0.305	45.5	131.2
3800	0.577	136.2	1.700	33.9	0.311	44.7	129.8
3900	0.584	134.9	1.654	32.6	0.315	43.6	128.6
4000	0.591	133.7	1.611	31.3	0.321	42.8	127.2

($V_{CE} = 3\text{ V}$, $I_C = 40\text{ mA}$, $Z_O = 50\ \Omega$)

f (MHz)	S11		S21 S12 S22					
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.396	-85.4	48.244	130.4	0.012	85.0	0.667	-48.6
200	0.369	-125.9	28.970	109.8	0.024	70.8	0.410	-71.1
300	0.364	-144.7	20.057	100.9	0.035	67.8	0.291	-84.0
400	0.363	-155.2	15.271	95.4	0.043	73.6	0.222	-92.1
500	0.363	-162.4	12.290	91.6	0.053	73.6	0.179	-99.1
600	0.368	-167.4	10.310	88.4	0.062	72.6	0.152	-106.8
700	0.370	-171.5	8.858	85.8	0.072	72.6	0.130	-113.7
800	0.372	-174.7	7.780	83.4	0.080	73.1	0.118	-121.3
900	0.377	-178.0	6.929	81.2	0.091	71.3	0.107	-129.1
1000	0.379	179.4	6.255	79.1	0.100	71.1	0.099	-137.5
1100	0.383	177.1	5.701	77.1	0.109	70.8	0.097	-145.3
1200	0.388	174.6	5.236	75.2	0.119	69.9	0.095	-153.7
1300	0.394	172.6	4.837	73.3	0.128	69.4	0.094	-161.2
1400	0.397	170.6	4.507	71.5	0.137	68.6	0.098	-168.1
1500	0.405	168.6	4.213	69.7	0.145	67.6	0.103	-175.0
1600	0.411	166.8	3.955	67.9	0.155	66.8	0.108	179.9
1700	0.417	165.3	3.728	66.2	0.163	65.7	0.113	174.5
1800	0.422	163.7	3.528	64.6	0.172	64.7	0.119	170.2
1900	0.428	162.0	3.352	62.8	0.180	63.8	0.127	166.1
2000	0.434	160.4	3.191	61.2	0.188	62.9	0.134	162.7
2100	0.441	158.7	3.043	59.5	0.197	62.0	0.142	159.3
2200	0.449	157.4	2.909	57.9	0.205	61.0	0.151	156.7
2300	0.456	155.8	2.790	56.3	0.214	59.8	0.161	154.1
2400	0.464	154.3	2.674	54.7	0.221	58.8	0.170	151.9
2500	0.472	152.9	2.573	53.1	0.229	57.7	0.180	149.3
2600	0.479	151.5	2.476	51.6	0.236	56.7	0.188	147.5
2700	0.487	150.1	2.386	50.1	0.244	55.8	0.200	145.6
2800	0.493	148.7	2.301	48.5	0.251	54.7	0.209	143.9
2900	0.499	147.6	2.215	47.2	0.259	53.5	0.220	141.9
3000	0.508	146.8	2.151	46.3	0.266	52.8	0.230	140.4
3100	0.526	145.4	2.115	44.8	0.272	51.5	0.242	138.6
3200	0.534	143.5	2.054	42.6	0.278	50.4	0.250	137.4
3300	0.541	141.7	1.993	40.8	0.285	49.7	0.262	135.7
3400	0.543	140.2	1.910	39.0	0.291	48.5	0.273	134.5
3500	0.549	139.5	1.849	38.1	0.297	47.5	0.284	132.9
3600	0.558	138.4	1.804	36.8	0.303	46.3	0.294	131.5
3700	0.567	137.2	1.757	35.5	0.308	45.4	0.304	130.1
3800	0.575	135.8	1.710	34.2	0.313	44.6	0.314	128.7
3900	0.583	134.6	1.665	32.9	0.318	43.5	0.324	127.5
4000	0.589	133.4	1.621	31.6	0.323	42.7	0.334	126.0

Package Dimensions

As of July, 2002
Unit: mm



Hitachi Code	MFPAK
JEDEC	—
JEITA	—
Mass (reference value)	0.0016 g