2SC5773

Silicon NPN Epitaxial
UHF / VHF wide band amplifier

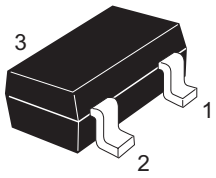
REJ03G0756-0300
Rev.3.00
May 09, 2006

Features

- High gain bandwidth product
  f_T = 10.8 GHz typ.
- High power gain and low noise figure ;
  PG = 11.9 dB typ., NF = 1.1 dB typ. at f = 900 MHz

Outline

RENESAS Package code: PLSP0003ZB-A
(Package name: MPAK)



1. Emitter
2. Base
3. Collector

Note: Marking is “JR-”.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	6	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Collector power dissipation	Pc	700*	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

* When using aluminum ceramic board (25 x 60 x 0.7 mm)

This data sheet contains tentative specification for new product development. It may partially be subject to change without notice.

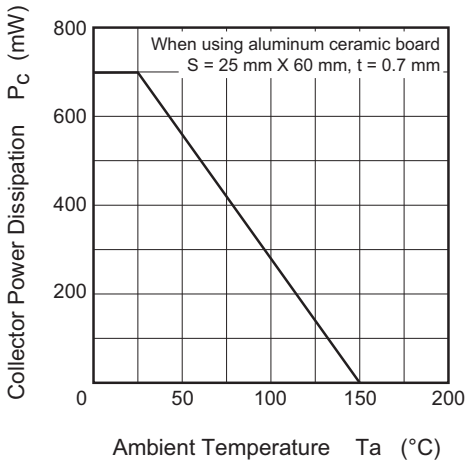
Electrical Characteristics

(Ta = 25°C)

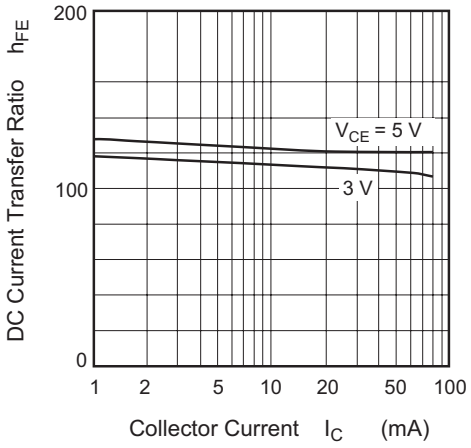
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	1	µA	V_{CB} = 12 V, I_E = 0
Collector cutoff current	I_{CEO}	—	—	1	mA	V_{CE} = 6 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 1.5 V, I_C = 0
DC current transfer ratio	h_{FE}	80	120	160		V_{CE} = 5 V, I_C = 50 mA
Collector output capacitance	Cob	—	1.25	1.8	pF	V_{CB} = 5 V, I_E = 0 f = 1 MHz
Reverse transfer capacitance	Cre	—	0.98	—	pF	V_{CB} = 5 V, I_E = 0 f = 1 MHz
Gain bandwidth product	f_T	8	10.8	—	GHz	V_{CE} = 5 V, I_C = 50 mA f = 1 GHz
S_{21} parameter	$\|S_{21}\|^2$	—	11	—	dB	V_{CE} = 5 V, I_C = 50 mA f = 1 GHz
Power gain	PG	9	11.9	—	dB	V_{CE} = 5 V, I_C = 50 mA f = 900 MHz
Noise figure	NF	—	1.1	1.9	dB	V_{CE} = 5 V, I_C = 5 mA f = 900 MHz

Main Characteristics

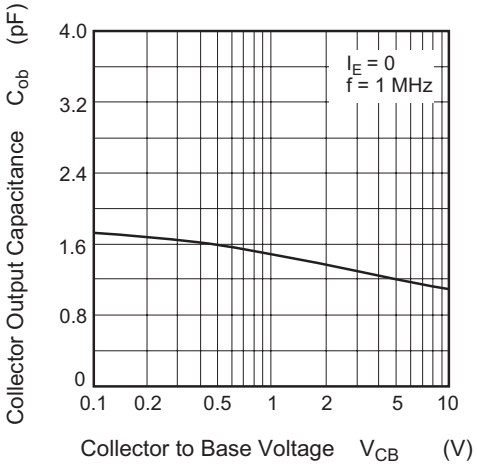
Collector Power Dissipation Curve



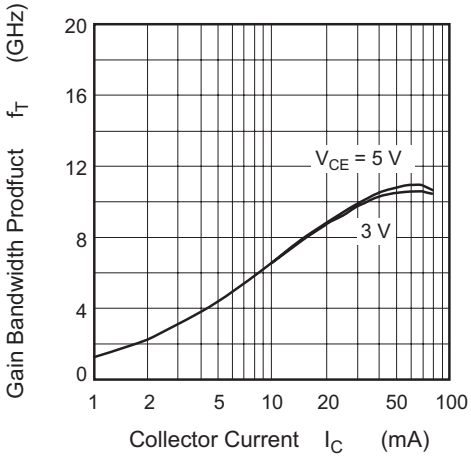
DC Current Transfet Ratio vs. Collector Current



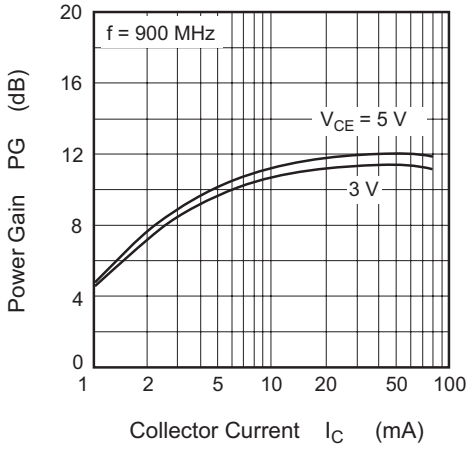
Collector Output Capacitance vs. Collector to Base Voltage



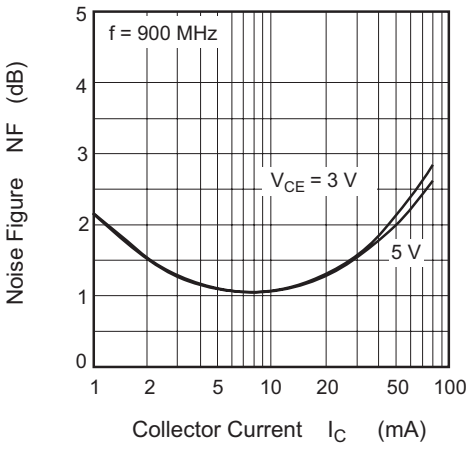
Gain Bandwidth Product vs. Collector Current

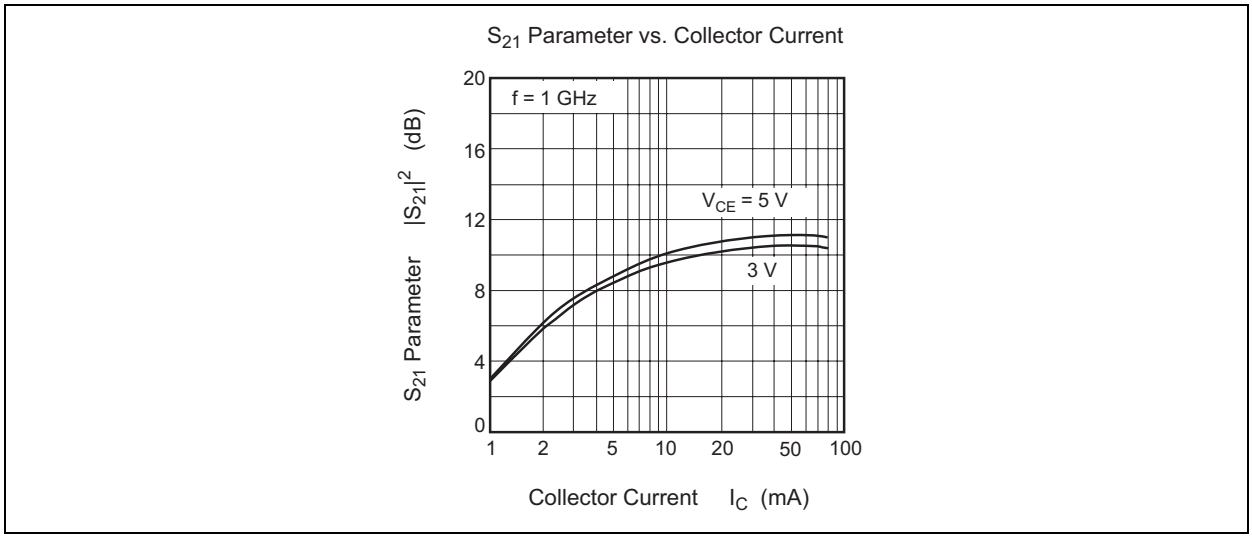


Power Gain vs. Collector Current

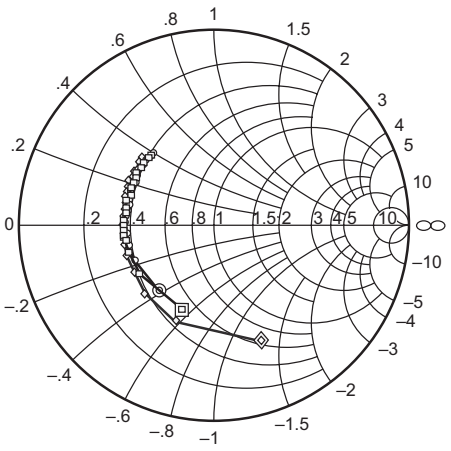


Noise Figure vs. Collector Current



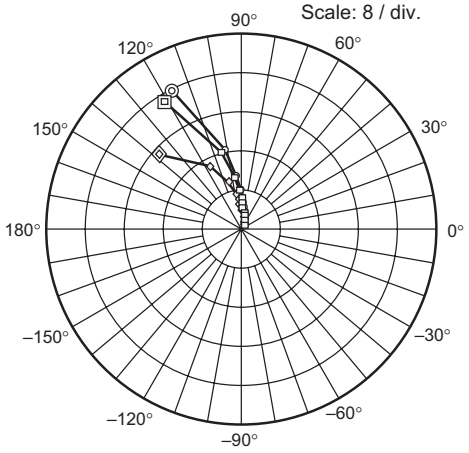


S11 Parameter vs. Frequency



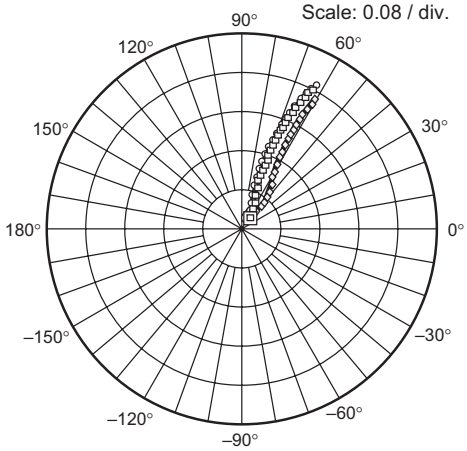
Condition: V_{CE} = 3 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)
(IC = 10 mA)

S21 Paramter vs. Frequency



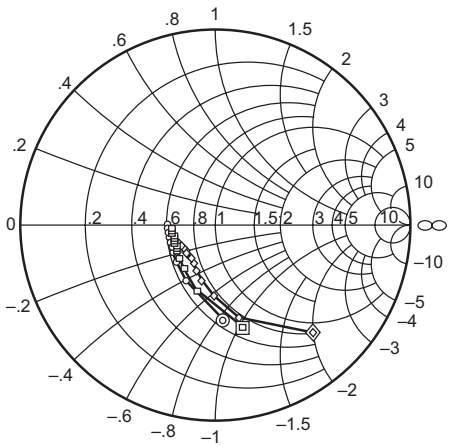
Condition: V_{CE} = 3 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)
(IC = 10 mA)

S12 Parameter vs. Frequency



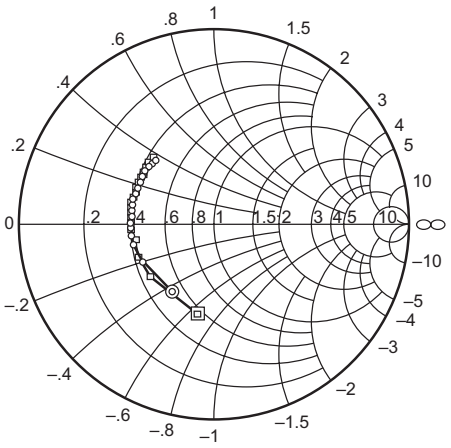
Condition: V_{CE} = 3 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)
(IC = 10 mA)

S22 Parameter vs. Frequency



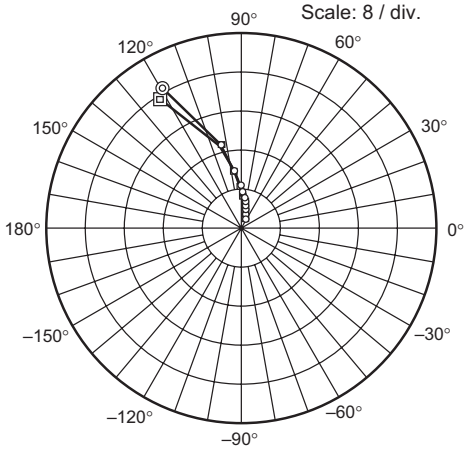
Condition: V_{CE} = 3 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)
(IC = 10 mA)

S11 Parameter vs. Frequency



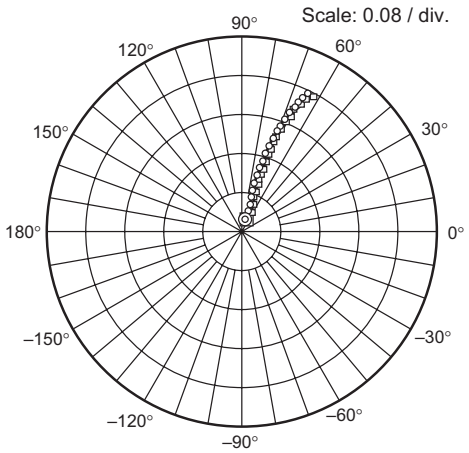
Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)

S21 Paramter vs. Frequency



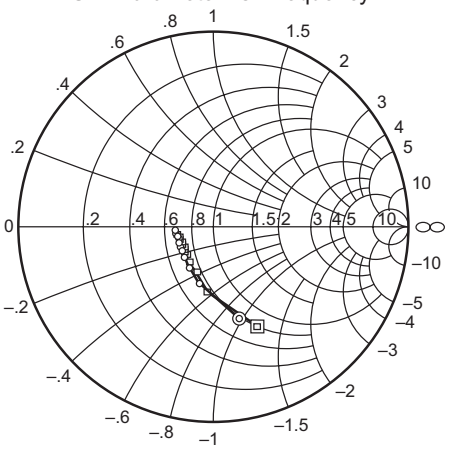
Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)

S12 Parameter vs. Frequency



Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)

S22 Parameter vs. Frequency



Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 2000 MHz (100 MHz Step)
(IC = 50 mA)
(IC = 30 mA)

Sparameter

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

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.643	-68.8	21.09	137.1	0.042	60.3	0.740	-47.5
200	0.532	-112.2	13.52	114.6	0.061	51.4	0.487	-74.5
300	0.496	-135.9	9.42	103.2	0.073	51.7	0.355	-90.4
400	0.475	-150.6	7.19	96.2	0.085	53.9	0.288	-100.9
500	0.471	-160.9	5.80	91.1	0.097	56.1	0.250	-109.7
600	0.468	-168.0	4.88	87.0	0.109	57.8	0.225	-116.6
700	0.468	-174.7	4.21	83.2	0.121	59.5	0.210	-122.2
800	0.464	179.4	3.71	79.9	0.134	60.8	0.199	-126.8
900	0.467	174.7	3.30	77.0	0.148	61.7	0.193	-131.1
1000	0.465	169.9	3.00	74.1	0.161	62.2	0.187	-134.2
1100	0.468	166.5	2.75	71.6	0.174	62.5	0.185	-137.4
1200	0.477	162.7	2.55	69.1	0.188	62.9	0.184	-139.9
1300	0.478	159.2	2.38	66.6	0.201	62.7	0.182	-142.2
1400	0.479	155.7	2.23	64.4	0.215	62.7	0.182	-144.0
1500	0.483	152.8	2.10	62.2	0.227	62.8	0.183	-146.1
1600	0.486	149.7	1.98	59.9	0.242	62.4	0.185	-147.5
1700	0.490	146.0	1.89	58.0	0.255	62.2	0.186	-149.0
1800	0.489	143.6	1.80	55.9	0.268	61.8	0.187	-150.8
1900	0.492	140.7	1.73	54.1	0.281	61.3	0.190	-152.1
2000	0.497	137.9	1.67	51.9	0.292	60.8	0.192	-152.9

(V_{CE} = 3 V, I_C = 30 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.449	-112.7	29.89	120.9	0.029	59.9	0.534	-74.7
200	0.445	-148.0	16.17	103.3	0.044	62.6	0.336	-106.4
300	0.449	-163.2	10.77	95.7	0.059	66.4	0.269	-124.9
400	0.456	-171.8	8.08	90.8	0.075	68.8	0.242	-136.3
500	0.454	-178.9	6.47	87.2	0.092	70.0	0.230	-144.6
600	0.451	176.4	5.42	83.9	0.108	71.0	0.223	-150.6
700	0.455	171.6	4.65	81.1	0.124	71.0	0.219	-155.1
800	0.458	167.4	4.09	78.4	0.141	70.9	0.216	-158.9
900	0.462	163.5	3.65	76.0	0.158	70.6	0.216	-161.6
1000	0.455	160.3	3.32	73.5	0.173	70.1	0.214	-164.2
1100	0.463	156.4	3.02	71.6	0.190	69.7	0.215	-166.5
1200	0.469	153.6	2.80	69.1	0.205	69.0	0.215	-168.1
1300	0.465	150.9	2.61	67.3	0.220	68.1	0.214	-170.0
1400	0.471	147.1	2.45	65.3	0.236	67.6	0.216	-171.3
1500	0.477	144.9	2.30	63.3	0.251	66.8	0.216	-172.5
1600	0.477	142.5	2.17	61.2	0.268	66.0	0.217	-173.9
1700	0.473	138.9	2.08	59.5	0.282	65.2	0.218	-174.8
1800	0.483	136.9	1.98	57.7	0.296	64.0	0.219	-175.5
1900	0.479	133.8	1.90	55.9	0.311	63.3	0.220	-176.5
2000	0.482	131.3	1.84	53.8	0.322	62.3	0.220	-177.2

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

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.421	-130.8	31.68	116.2	0.025	62.9	0.468	-84.7
200	0.437	-159.1	16.57	100.7	0.040	67.3	0.308	-117.4
300	0.448	-169.5	10.94	93.9	0.058	71.0	0.261	-135.2
400	0.449	-177.1	8.18	89.5	0.075	72.9	0.243	-145.5
500	0.461	177.1	6.57	86.2	0.092	73.4	0.236	-152.5
600	0.455	173.0	5.48	83.2	0.109	73.7	0.232	-158.0
700	0.459	168.3	4.71	80.5	0.126	73.5	0.230	-161.8
800	0.463	164.8	4.15	78.1	0.143	73.0	0.229	-164.9
900	0.465	161.9	3.68	75.9	0.161	72.6	0.229	-167.4
1000	0.464	158.2	3.35	73.3	0.177	71.9	0.228	-169.6
1100	0.467	154.9	3.07	71.3	0.193	70.8	0.229	-171.7
1200	0.468	152.0	2.83	69.3	0.210	70.2	0.229	-173.2
1300	0.467	148.7	2.64	67.2	0.225	69.0	0.229	-174.7
1400	0.475	145.2	2.47	65.2	0.241	68.4	0.230	-175.7
1500	0.477	143.4	2.33	63.5	0.257	67.5	0.230	-177.1
1600	0.482	141.3	2.20	61.4	0.273	66.5	0.231	-178.2
1700	0.480	137.3	2.11	59.7	0.288	65.6	0.232	-179.0
1800	0.485	135.5	2.01	57.8	0.303	64.6	0.232	-179.9
1900	0.481	132.8	1.92	56.1	0.318	63.7	0.234	179.0
2000	0.484	129.6	1.85	54.4	0.330	62.6	0.232	178.6

(V_{CE} = 5 V, I_C = 30 mA, Zo = 50 Ω)

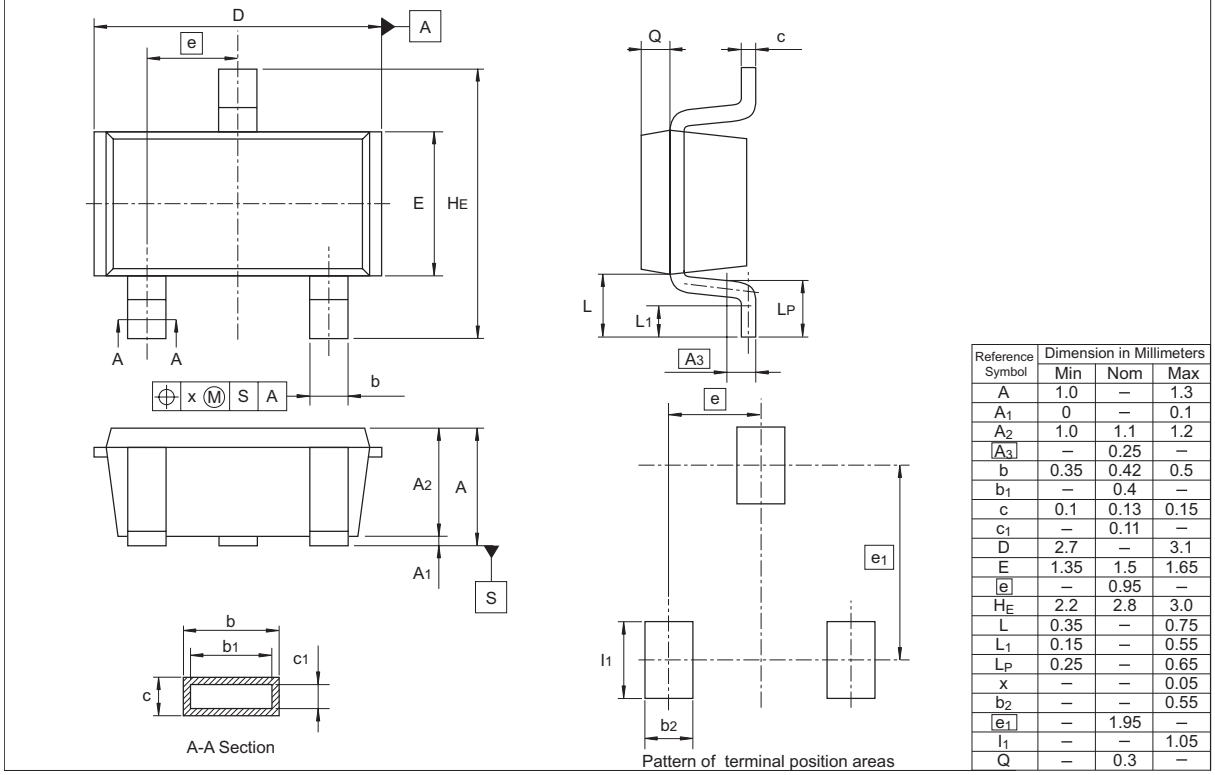
f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.447	-102.8	31.04	123.3	0.028	60.6	0.552	-66.3
200	0.419	-142.1	17.16	105.0	0.042	62.5	0.333	-94.7
300	0.416	-158.2	11.49	96.8	0.057	66.4	0.250	-112.0
400	0.414	-168.7	8.63	91.7	0.072	69.2	0.214	-123.3
500	0.421	-176.4	6.92	88.0	0.088	70.2	0.196	-132.1
600	0.419	178.3	5.79	84.8	0.103	70.9	0.185	-138.6
700	0.418	173.3	4.98	81.8	0.119	70.9	0.179	-144.0
800	0.426	168.4	4.37	79.3	0.135	70.9	0.174	-148.5
900	0.425	165.9	3.89	76.6	0.151	70.7	0.173	-151.8
1000	0.423	161.7	3.53	74.2	0.166	70.5	0.171	-154.9
1100	0.428	157.9	3.23	72.1	0.181	69.8	0.171	-157.2
1200	0.432	154.3	2.98	70.0	0.196	69.3	0.171	-159.2
1300	0.429	151.6	2.79	67.9	0.211	68.4	0.170	-161.5
1400	0.436	148.6	2.60	66.1	0.226	67.9	0.171	-162.7
1500	0.437	145.5	2.45	64.1	0.240	67.0	0.172	-163.9
1600	0.447	143.3	2.31	61.9	0.256	66.3	0.173	-165.5
1700	0.445	140.2	2.20	60.1	0.270	65.8	0.174	-166.5
1800	0.450	137.2	2.09	58.5	0.283	64.5	0.174	-167.8
1900	0.447	134.6	2.01	56.3	0.298	63.8	0.177	-168.6
2000	0.453	131.5	1.94	54.7	0.309	62.8	0.177	-169.4

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

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.402	-120.1	33.23	118.6	0.024	63.7	0.485	-74.9
200	0.406	-152.6	17.68	102.1	0.039	67.2	0.296	-104.7
300	0.414	-166.1	11.71	95.0	0.055	70.7	0.233	-122.4
400	0.413	-174.2	8.78	90.4	0.072	72.4	0.207	-133.6
500	0.417	179.5	7.03	87.0	0.088	73.0	0.195	-141.7
600	0.419	174.7	5.88	84.0	0.104	73.5	0.188	-147.9
700	0.419	169.9	5.05	81.3	0.121	73.2	0.185	-152.6
800	0.423	166.2	4.44	78.7	0.137	72.7	0.182	-156.4
900	0.427	161.6	3.94	76.4	0.154	72.3	0.182	-159.3
1000	0.423	158.2	3.58	73.9	0.169	71.6	0.180	-161.8
1100	0.428	154.7	3.27	71.9	0.185	70.9	0.181	-164.2
1200	0.428	152.5	3.02	70.0	0.201	70.4	0.181	-165.9
1300	0.435	148.6	2.82	67.8	0.216	69.3	0.181	-167.5
1400	0.434	145.2	2.65	65.9	0.231	68.8	0.182	-168.9
1500	0.443	143.0	2.48	64.2	0.246	67.8	0.182	-170.1
1600	0.447	140.4	2.35	62.1	0.262	66.9	0.184	-171.4
1700	0.444	137.3	2.24	60.4	0.275	65.9	0.185	-172.2
1800	0.451	134.1	2.13	58.6	0.290	64.9	0.186	-173.5
1900	0.445	132.1	2.05	56.7	0.304	64.2	0.187	-174.2
2000	0.454	129.3	1.96	54.9	0.316	63.0	0.187	-174.7

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
MPAK	SC-59A	PLSP0003ZB-A	MPAK(T) / MPAK(T)V	0.011g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	1.0	–	1.3
A_1	0	–	0.1
A_2	1.0	1.1	1.2
A_3	–	0.25	–
b	0.35	0.42	0.5
b_1	–	0.4	–
c	0.1	0.13	0.15
c_1	–	0.11	–
D	2.7	–	3.1
E	1.35	1.5	1.65
e	–	0.95	–
H_E	2.2	2.8	3.0
L	0.35	–	0.75
L_1	0.15	–	0.55
L_P	0.25	–	0.65
x	–	–	0.05
b_2	–	–	0.55
e_1	–	1.95	–
l_1	–	–	1.05
Q	–	0.3	–

Ordering Information

Part Name	Quantity	Shipping Container
2SC5773JR-TL-E	3000	ϕ 178 mm Reel, 8 mm Emboss Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

RENESAS SALES OFFICES

http://www.renesas.com

Refer to "**http://www.renesas.com/en/network**" for the latest and detailed information.

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