To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

2SC5849

Silicon NPN Epitaxial
VHF/UHF wide band amplifier

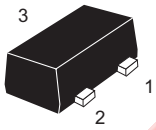
REJ03G0759-0100
(Previous ADE-208-1469)
Rev.1.00
Aug.10.2005

Features

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

Outline

RENESAS Package code: PUSF0003ZA-A
(Package name: MFPAK®)



1. Emitter
2. Base
3. Collector

Note: Marking is "WY–".

*MFPAK is a trademark of Renesas Technology Corp.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	6.0	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

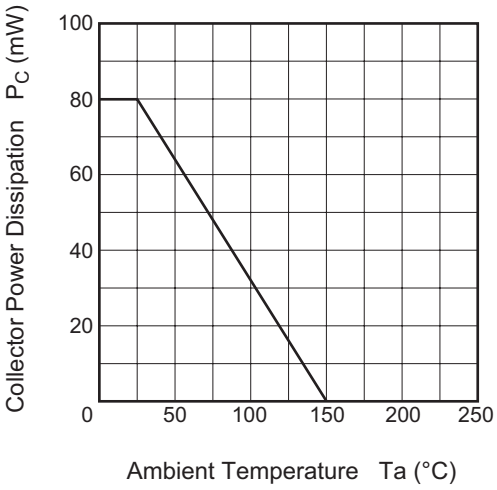
Electrical Characteristics

(Ta = 25°C)

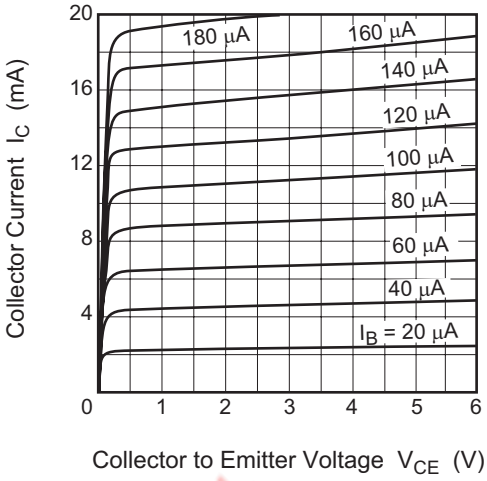
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	0.1	µA	V_{CB} = 15 V, I_E = 0
Collector cutoff current	I_{CEO}	—	—	0.1	µA	V_{CE} = 6.0 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	0.1	µA	V_{EB} = 1.5 V, I_C = 0
DC current transfer ratio	h_{FE}	90	110	140		V_{CE} = 1 V, I_C = 5 mA
Reverse transfer capacitance	C_{re}	—	0.5	—	pF	V_{CE} = 1 V, Emitter ground, f = 1 MHz
Collector output capacitance	C_{ob}	—	0.85	1.15	pF	V_{CB} = 1 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T(1)	1.0	4.0	—	GHz	V_{CE} = 1 V, I_C = 5 mA
Gain bandwidth product	f_T(2)	—	9.0	—	GHz	V_{CE} = 1 V, I_C = 30 mA
Power gain	PG	10	13	—	dB	V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz
Noise figure	NF	—	1.1	1.8	dB	V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz

Main Characteristics

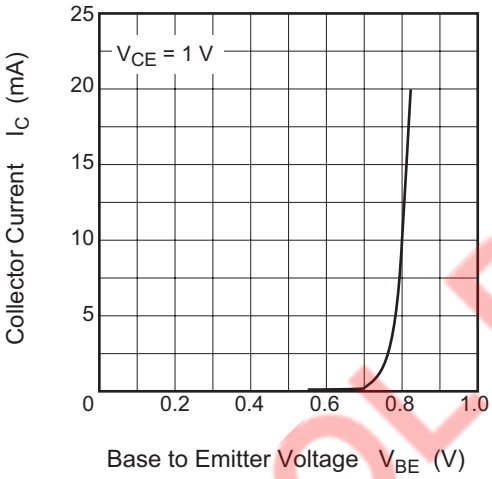
Collector Power Dissipation Curve



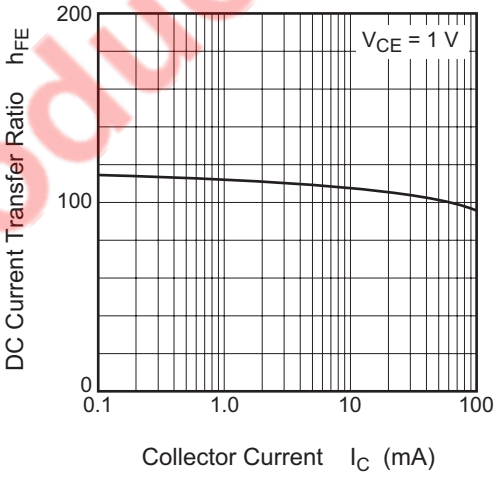
Typical Output Characteristics



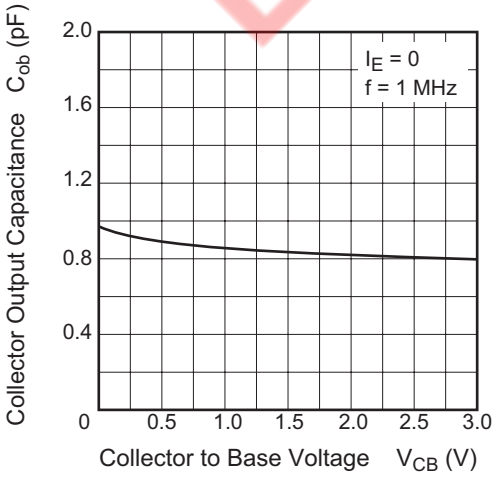
Typical Transfer Characteristics



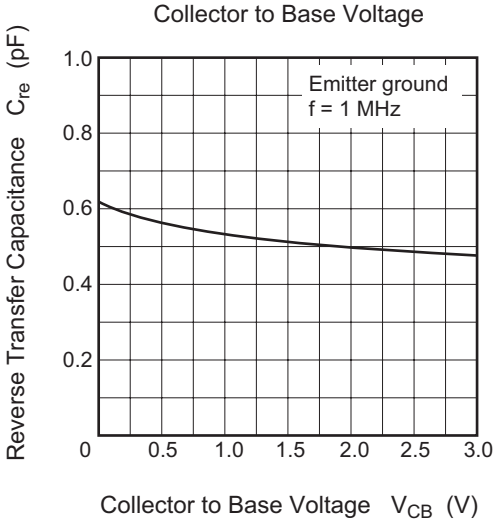
DC Current Transfer Ratio vs. Collector Current



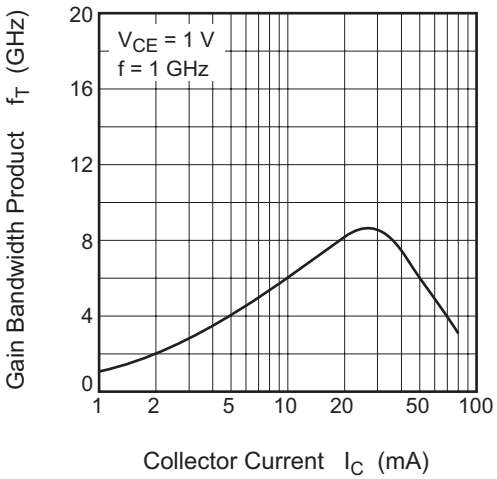
Collector Output Capacitance vs. Collector to Base Voltage



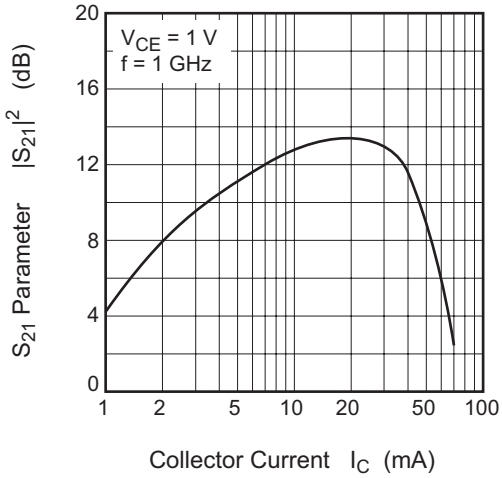
Reverse Transfer Capacitance vs. Collector to Base Voltage



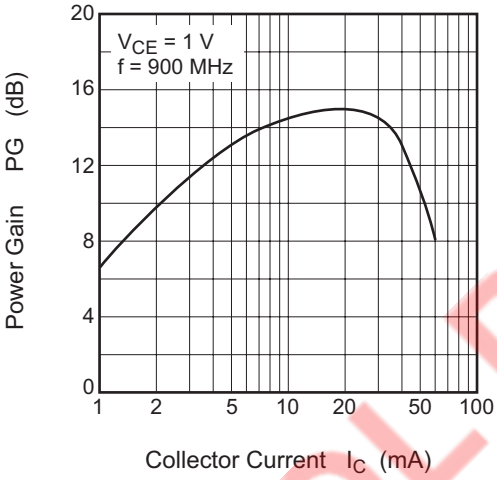
Gain Bandwidth Product vs. Collector Current



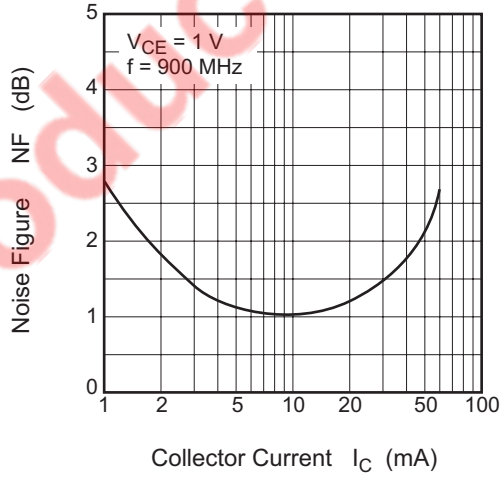
S_{21} Parameter vs. Collector Current



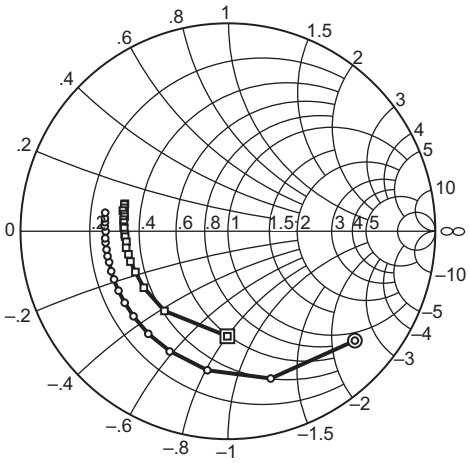
Power Gain vs. Collector Current



Noise Figure vs. Collector Current



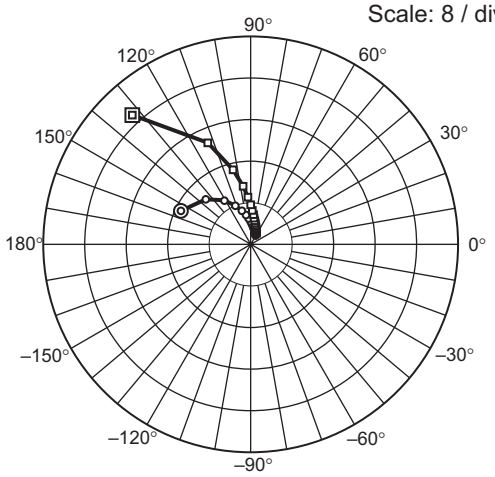
S_{11} Parameter vs. Frequency



Test conditions: V_{CE} = 1 V , Z_O = 50 Ω
100 to 2000 MHz (100 MHz step)
(○—○ I_C = 5 mA)
(□—□ I_C = 20 mA)

S_{21} Parameter vs. Frequency

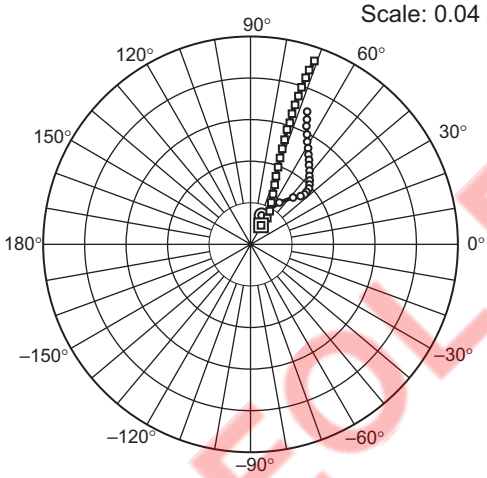
Scale: 8 / div.



Test conditions: V_{CE} = 1 V , Z_O = 50 Ω
100 to 2000 MHz (100 MHz step)
(○—○ I_C = 5 mA)
(□—□ I_C = 20 mA)

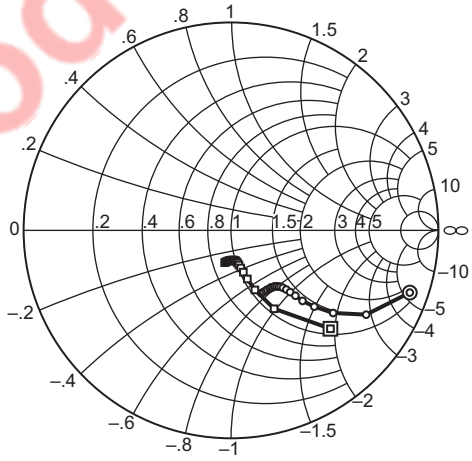
S_{12} Parameter vs. Frequency

Scale: 0.04 / div.



Test conditions: V_{CE} = 1 V , Z_O = 50 Ω
100 to 2000 MHz (100 MHz step)
(○—○ I_C = 5 mA)
(□—□ I_C = 20 mA)

S_{22} Parameter vs. Frequency



Test conditions: V_{CE} = 1 V , Z_O = 50 Ω
100 to 2000 MHz (100 MHz step)
(○—○ I_C = 5 mA)
(□—□ I_C = 20 mA)

S Parameter

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

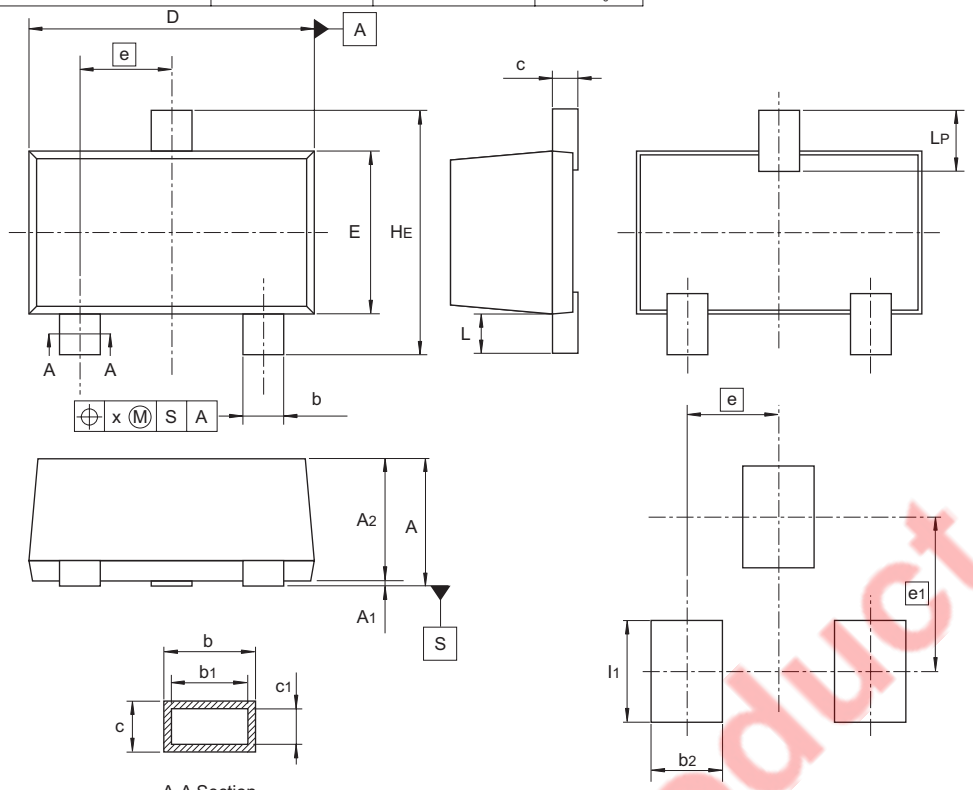
f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.807	–40.6	14.95	154.2	0.030	69.3	0.913	–19.1
200	0.737	–73.7	12.30	135.0	0.049	55.5	0.768	–31.8
300	0.675	–98.4	9.86	121.2	0.061	47.8	0.633	–38.8
400	0.642	–115.9	8.03	111.9	0.067	44.0	0.544	–42.3
500	0.624	–127.9	6.72	105.0	0.071	42.8	0.484	–44.4
600	0.611	–138.1	5.75	99.4	0.074	43.2	0.442	–45.2
700	0.604	–145.4	5.02	95.0	0.078	43.8	0.412	–46.0
800	0.599	–151.6	4.45	90.9	0.081	45.4	0.390	–46.7
900	0.595	–157.2	3.98	87.6	0.084	47.2	0.373	–47.6
1000	0.594	–161.2	3.62	84.5	0.087	49.3	0.362	–48.4
1100	0.591	–165.5	3.33	81.8	0.091	51.3	0.354	–49.5
1200	0.592	–168.4	3.06	79.0	0.095	53.6	0.347	–50.7
1300	0.591	–171.5	2.86	76.4	0.099	55.3	0.341	–52.0
1400	0.592	–174.8	2.66	74.1	0.103	57.2	0.340	–53.5
1500	0.592	–176.8	2.51	72.0	0.108	59.1	0.335	–54.8
1600	0.589	–180.0	2.35	69.7	0.113	61.1	0.337	–56.3
1700	0.594	177.7	2.23	67.8	0.119	62.8	0.334	–58.3
1800	0.594	175.7	2.13	65.7	0.126	64.7	0.335	–60.0
1900	0.596	173.9	2.03	63.7	0.132	65.7	0.335	–62.0
2000	0.598	171.3	1.94	61.9	0.139	66.9	0.335	–64.0

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

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.504	–90.3	33.79	132.5	0.021	61.4	0.674	–44.5
200	0.490	–128.6	21.25	112.9	0.030	57.6	0.431	–61.0
300	0.488	–146.2	14.78	103.3	0.037	60.2	0.309	–67.9
400	0.487	–156.3	11.31	97.4	0.045	63.7	0.247	–71.1
500	0.492	–162.8	9.13	93.3	0.053	66.0	0.210	–73.2
600	0.492	–167.0	7.65	90.0	0.062	68.0	0.187	–75.1
700	0.497	–170.8	6.58	87.2	0.070	69.6	0.171	–76.7
800	0.492	–174.1	5.78	84.4	0.079	70.4	0.160	–78.2
900	0.496	–177.0	5.13	82.6	0.088	71.2	0.152	–79.9
1000	0.498	–178.4	4.65	80.2	0.097	71.7	0.147	–81.4
1100	0.500	178.2	4.24	78.3	0.106	72.0	0.145	–83.2
1200	0.503	177.5	3.90	76.1	0.116	72.4	0.143	–85.1
1300	0.503	175.2	3.63	74.3	0.123	72.1	0.143	–87.2
1400	0.506	173.7	3.38	72.6	0.132	72.4	0.144	–88.8
1500	0.503	172.0	3.17	70.9	0.141	72.3	0.144	–91.2
1600	0.507	170.6	2.99	69.4	0.150	72.1	0.146	–92.8
1700	0.516	168.9	2.82	67.7	0.159	72.0	0.148	–95.0
1800	0.511	167.3	2.68	66.0	0.169	71.7	0.151	–97.0
1900	0.515	165.6	2.56	64.6	0.177	71.4	0.154	–99.0
2000	0.514	165.1	2.45	63.0	0.187	70.8	0.158	–100.8

Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-89 Modified	PUSF0003ZA-A	MFPAK / MFPAKV	0.0016g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.55	—	0.6
A_1	0	—	0.01
A_2	0.55	—	0.59
b	0.15	0.22	0.3
b_1	—	0.2	—
c	0.1	0.13	0.15
c_1	—	0.11	—
D	1.35	1.4	1.45
E	0.7	0.8	0.9
e	—	0.45	—
H_E	1.15	1.2	1.25
L	0.1	0.2	0.3
L_P	0.15	—	0.45
x	—	—	0.05
b_2	—	—	0.35
e_1	—	0.75	—
l_1	—	—	0.5

Ordering Information

Part Name	Quantity	Shipping Container
2SC5849WY-TR-E	9000	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

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http://www.renesas.com

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Colophon .3.0