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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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2SC5827

Silicon NPN Epitaxial
VHF/UHF wide band amplifier

RENESAS

ADE-208-1464(Z)

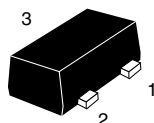
Rev.0
Nov. 2001

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 "WW-".

Absolute Maximum Ratings

(Ta = 25 °C)

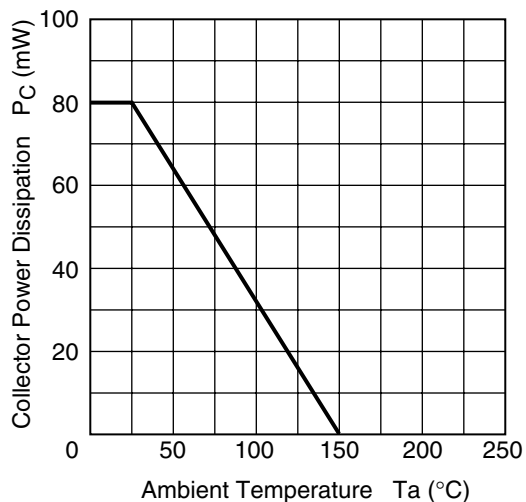
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	5.5	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Collector power dissipation	Pc	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	-55 to +150	°C

Electrical Characteristics

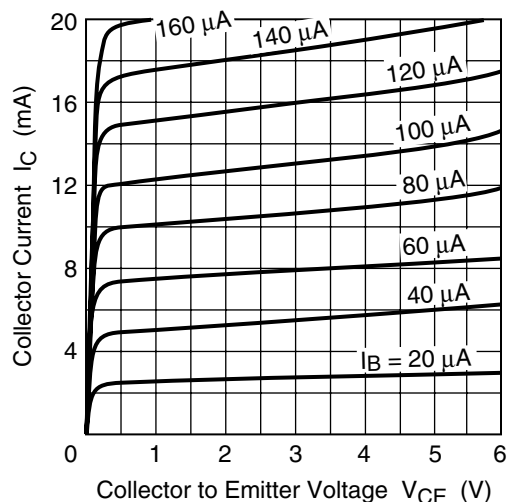
(Ta = 25 °C)

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	μA	$V_{CE} = 5.5 V, R_{BE} = \text{Infinite}$
Emitter cutoff current	I_{EBO}	—	—	0.1	μA	$V_{EB} = 1.5 V, I_C = 0$
DC current transfer ratio	h_{FE}	100	120	150	—	$V_{CE} = 1 V, I_C = 5 mA$
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	1.5	4.5	—	GHz	$V_{CE} = 1 V, I_C = 5 mA$
Power gain	PG	10.5	13.5	—	dB	$V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz$
Noise figure	NF	—	1.1	1.8	dB	$V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz$

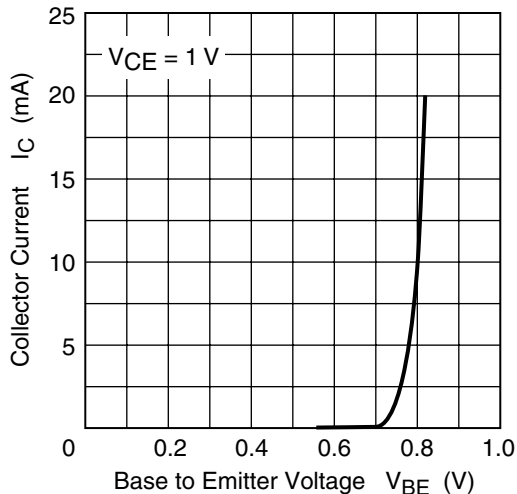
Collector Power Dissipation Curve



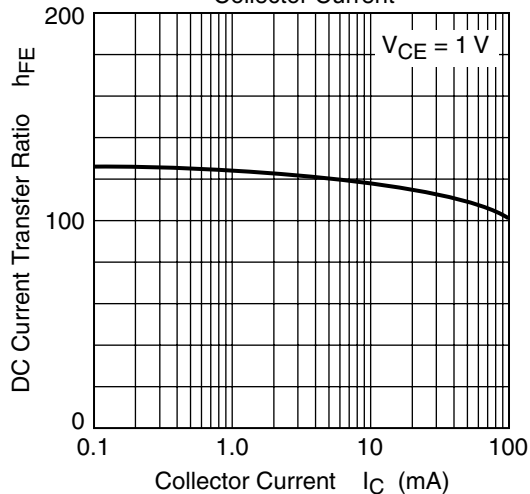
Typical Output Characteristics

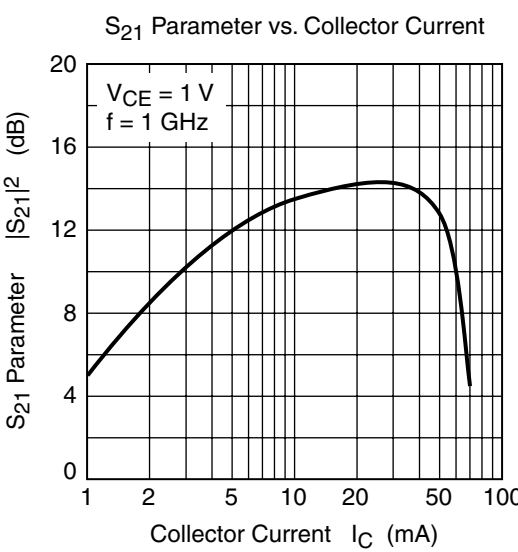
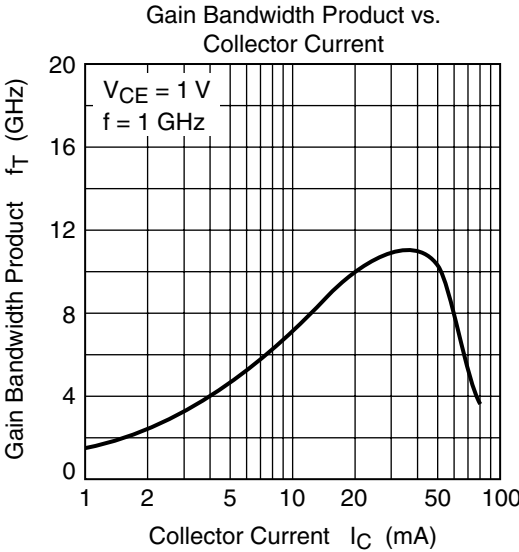
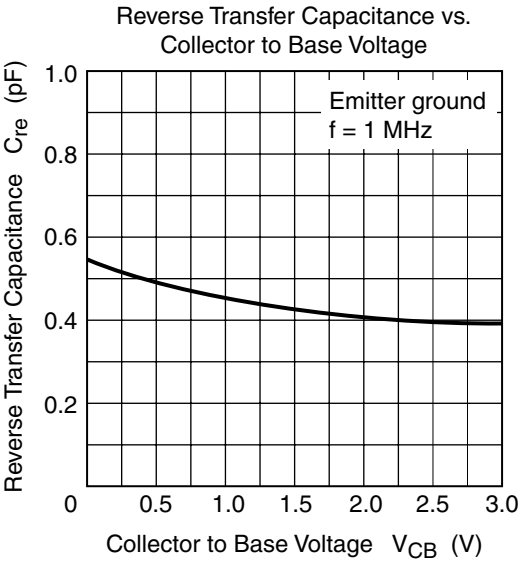
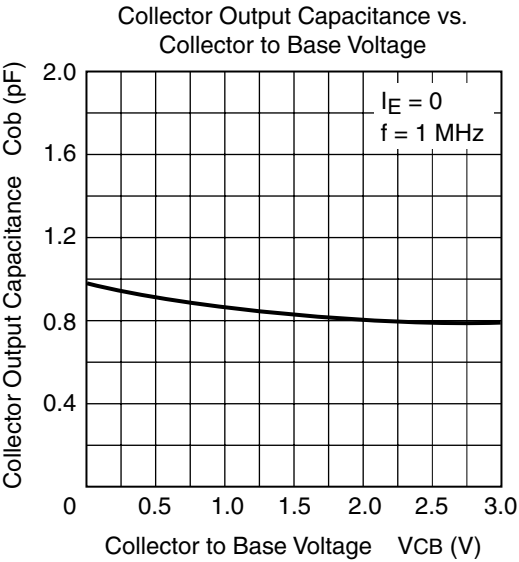


Typical Transfer Characteristics

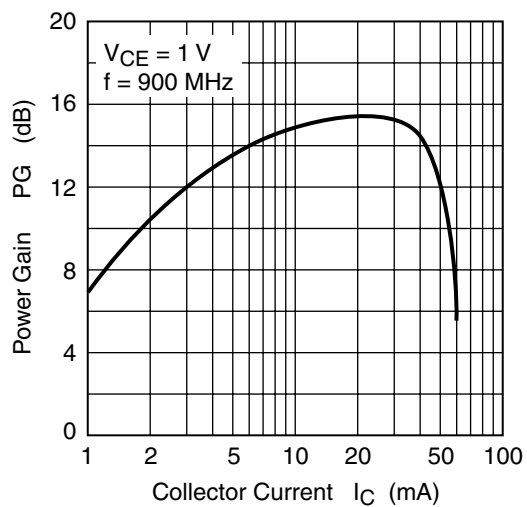


DC Current Transfer Ratio vs. Collector Current

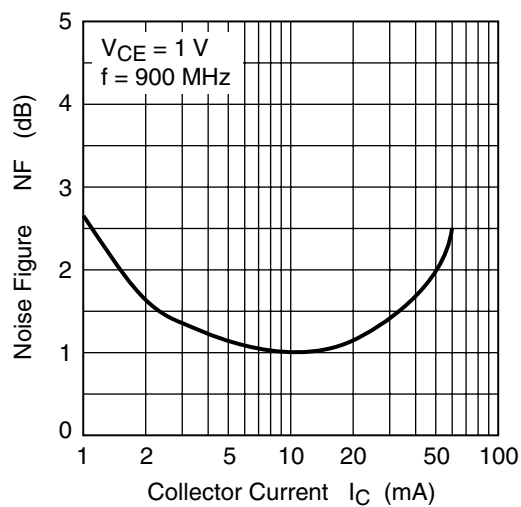




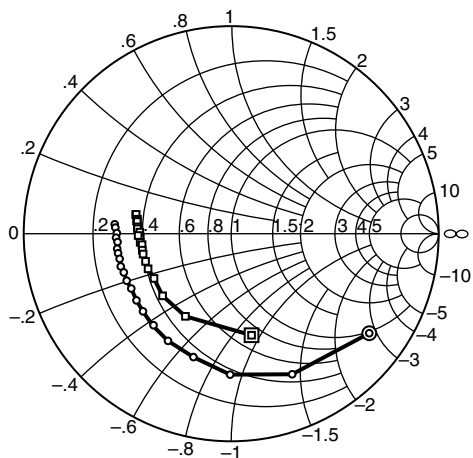
Power Gain vs. Collector Current



Noise Figure vs. Collector Current



S_{11} Parameter vs. Frequency

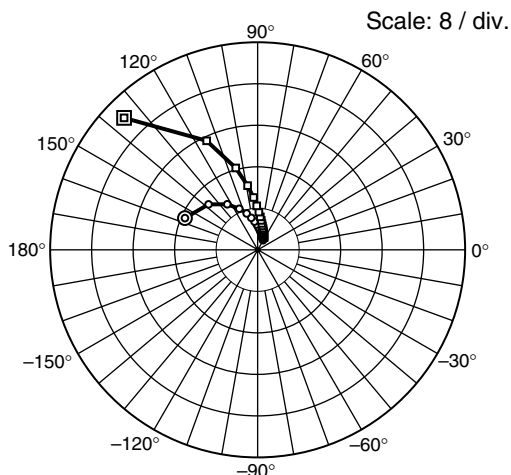


Test conditions: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
100 to 2000 MHz (100 MHz step)

⊙— ($I_C = 5$ mA)

⊠— ($I_C = 20$ mA)

S_{21} Parameter vs. Frequency



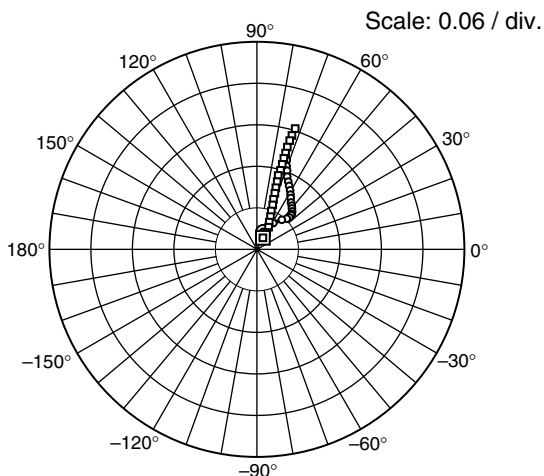
Scale: 8 / div.

Test conditions: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
100 to 2000 MHz (100 MHz step)

⊙— ($I_C = 5$ mA)

⊠— ($I_C = 20$ mA)

S_{12} Parameter vs. Frequency



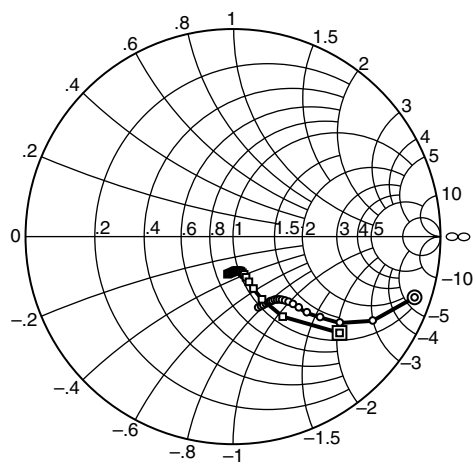
Scale: 0.06 / div.

Test conditions: $V_{CE} = 1$ V, $Z_O = 50 \Omega$
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, $Z_O = 50 \Omega$
100 to 2000 MHz (100 MHz step)

⊙— ($I_C = 5$ mA)

⊠— ($I_C = 20$ mA)

S Parameter
 $(V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, Z_o = 50\ \Omega)$

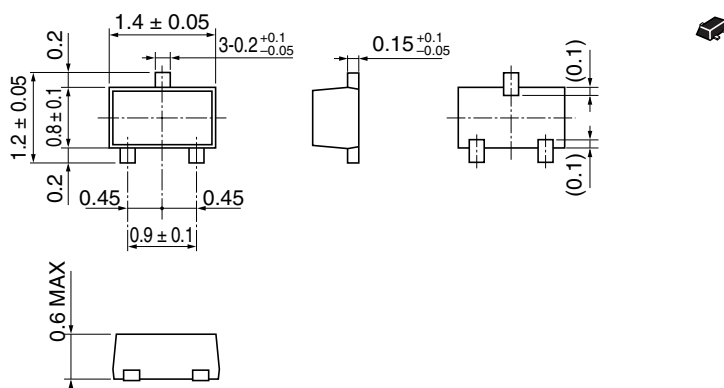
f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.820	-35.7	15.31	156.5	0.027	71.2	0.923	-18.5
200	0.738	-66.6	12.89	137.3	0.045	58.1	0.786	-31.0
300	0.679	-90.5	10.54	123.8	0.056	50.0	0.661	-38.8
400	0.622	-107.1	8.65	114.2	0.062	45.9	0.572	-42.8
500	0.600	-120.6	7.30	106.9	0.066	44.7	0.510	-45.7
600	0.579	-130.4	6.27	101.4	0.070	45.2	0.466	-47.1
700	0.567	-138.7	5.46	96.4	0.072	45.5	0.435	-48.3
800	0.559	-144.9	4.86	92.1	0.075	47.2	0.413	-49.5
900	0.550	-151.3	4.37	88.7	0.078	49.5	0.398	-50.8
1000	0.553	-155.8	3.99	85.2	0.081	51.5	0.386	-52.2
1100	0.551	-160.2	3.64	82.3	0.084	54.0	0.377	-53.5
1200	0.556	-163.5	3.36	79.0	0.089	56.7	0.371	-55.0
1300	0.552	-167.3	3.14	76.7	0.093	58.5	0.365	-56.5
1400	0.554	-170.2	2.92	74.2	0.098	60.7	0.363	-58.4
1500	0.555	-172.5	2.76	71.7	0.103	63.1	0.360	-60.0
1600	0.550	-175.8	2.58	69.3	0.108	65.2	0.361	-62.0
1700	0.556	-178.0	2.44	67.1	0.114	67.4	0.360	-63.9
1800	0.552	-179.7	2.32	65.0	0.122	69.0	0.361	-66.1
1900	0.560	-177.0	2.21	63.0	0.128	70.4	0.362	-68.0
2000	0.564	-175.4	2.11	60.6	0.136	71.5	0.363	-70.4

(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	0.499	−78.6	36.20	135.4	0.019	63.2	0.692	−42.1
200	0.454	−119.0	23.22	115.0	0.028	60.0	0.454	−58.1
300	0.445	−137.9	16.36	104.9	0.036	62.1	0.333	−65.1
400	0.429	−150.0	12.55	98.8	0.043	65.5	0.269	−68.4
500	0.434	−157.2	10.15	94.4	0.051	67.4	0.231	−70.5
600	0.433	−162.2	8.51	91.1	0.059	69.4	0.206	−72.1
700	0.435	−167.1	7.31	88.0	0.068	70.4	0.190	−73.4
800	0.435	−169.6	6.41	85.2	0.076	71.6	0.180	−75.2
900	0.432	−173.1	5.75	82.9	0.085	72.2	0.172	−77.0
1000	0.440	−174.7	5.19	80.9	0.093	72.9	0.169	−78.4
1100	0.438	−178.1	4.74	78.5	0.102	73.3	0.167	−80.0
1200	0.448	−179.0	4.33	76.3	0.111	73.9	0.165	−82.2
1300	0.440	178.9	4.05	74.7	0.119	73.4	0.165	−84.2
1400	0.452	176.8	3.75	72.8	0.128	73.4	0.165	−86.1
1500	0.453	175.7	3.52	71.1	0.137	73.5	0.167	−88.0
1600	0.456	172.5	3.33	69.3	0.145	73.4	0.170	−90.0
1700	0.460	172.2	3.13	67.1	0.154	73.4	0.172	−91.9
1800	0.457	171.1	2.97	65.6	0.164	73.2	0.176	−94.2
1900	0.467	168.4	2.83	64.0	0.172	72.9	0.179	−96.3
2000	0.469	168.6	2.70	62.4	0.183	72.4	0.183	−98.2

Package Dimensions

As of July, 2001
Unit: mm



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

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