To all our customers

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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

ADE–208–1464(Z)

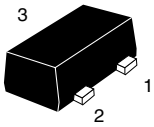
Rev.0
Nov. 2001

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)

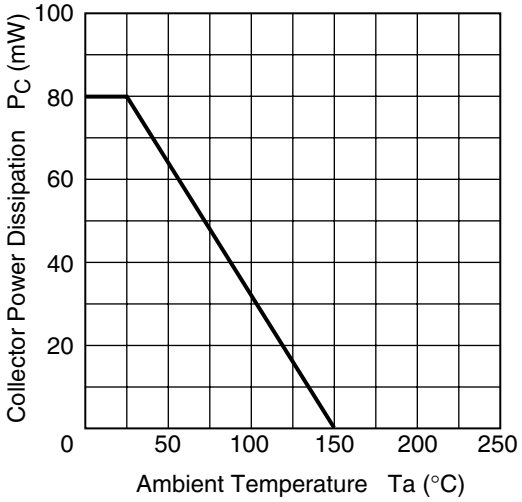
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	5.5	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Collector power dissipation	Pc	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

Electrical Characteristics

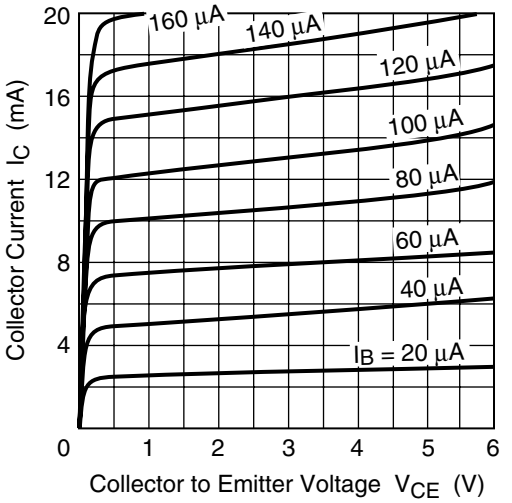
(Ta = 25 °C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 µA, 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} = 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

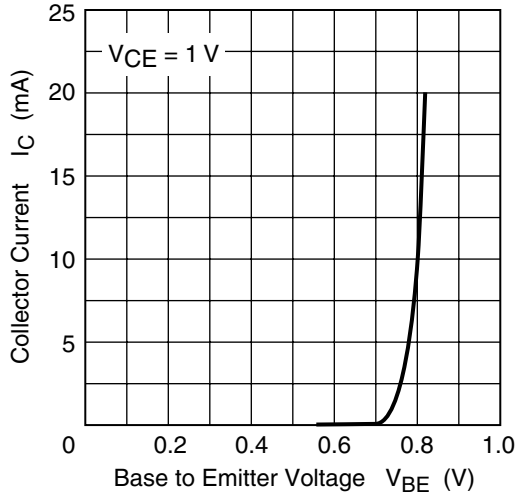
Collector Power Dissipation Curve



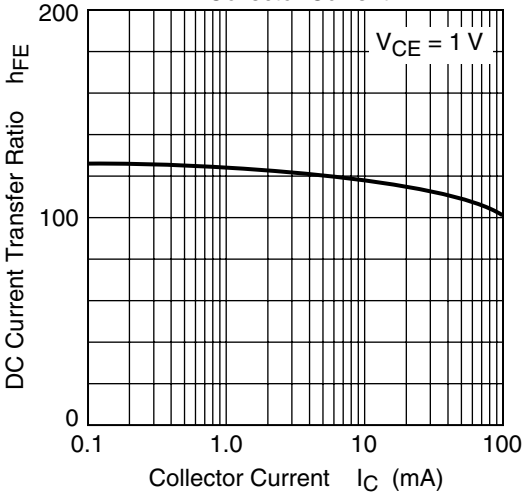
Typical Output Characteristics



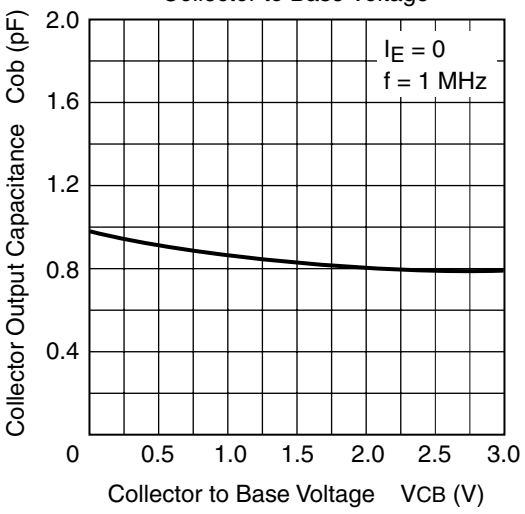
Typical Transfer Characteristics



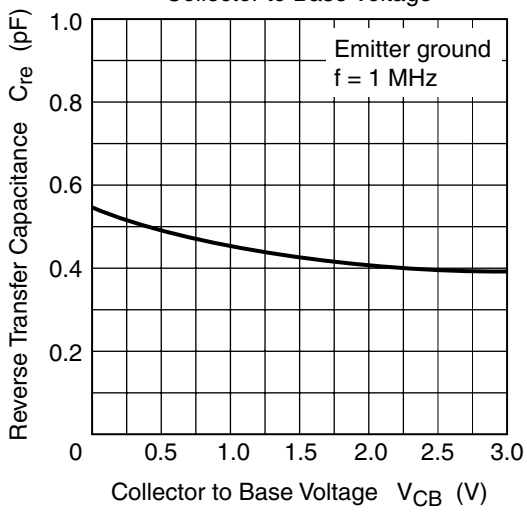
DC Current Transfer Ratio vs. Collector Current



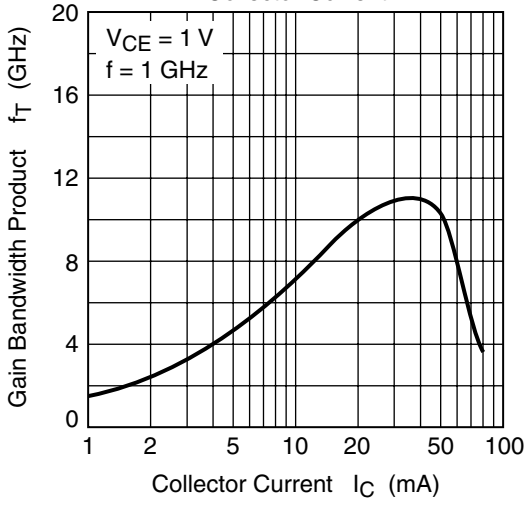
Collector Output Capacitance vs. Collector to Base Voltage



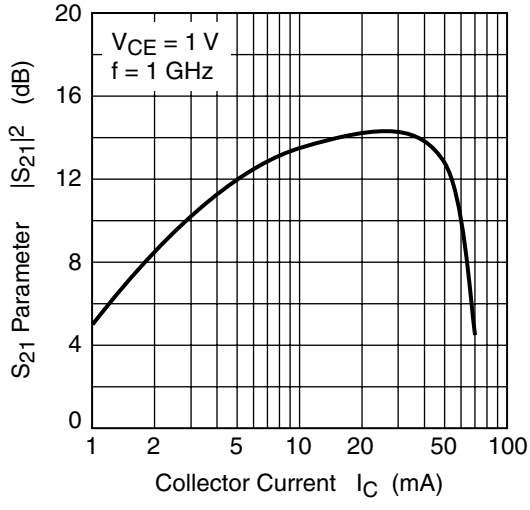
Reverse Transfer Capacitance vs. Collector to Base Voltage



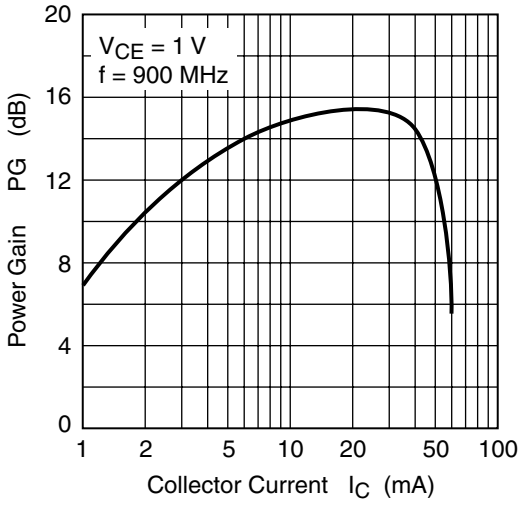
Gain Bandwidth Product vs. Collector Current



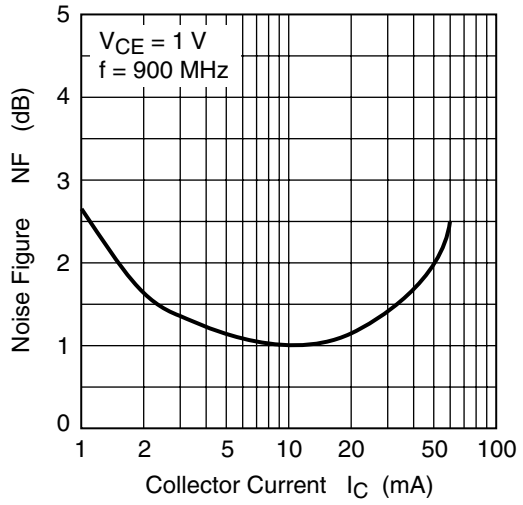
S_{21} Parameter vs. Collector Current



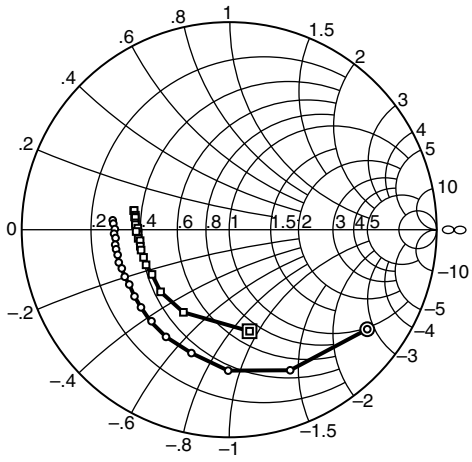
Power Gain vs. Collector Current



Noise Figure vs. Collector Current



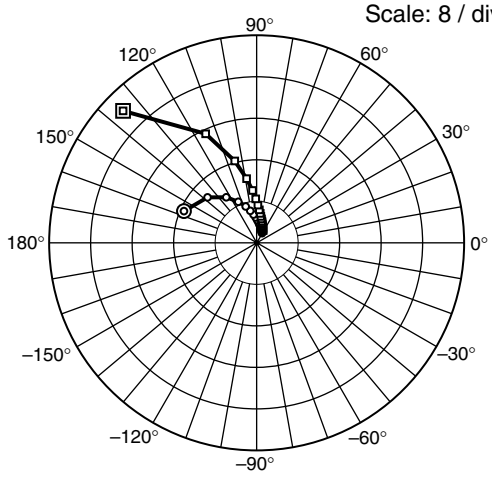
S_{11} Parameter vs. Frequency



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

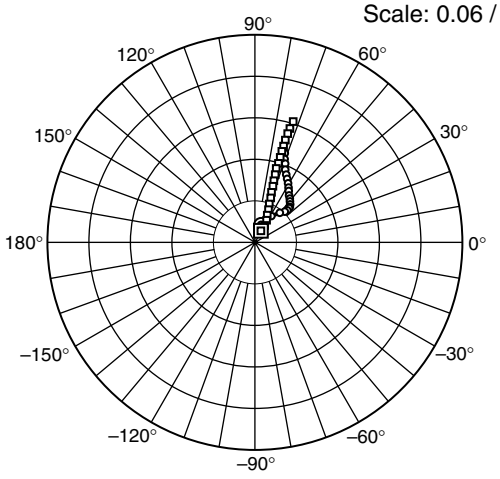
Scale: 8 / div.



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)

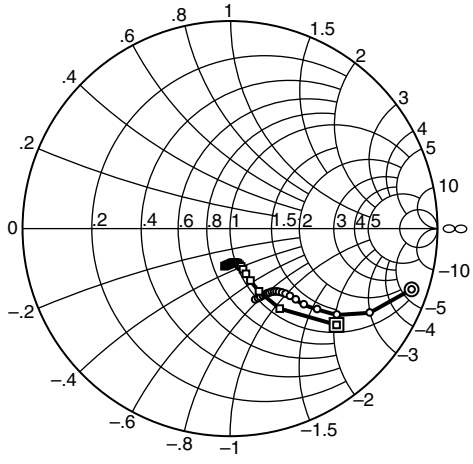
S_{12} Parameter vs. Frequency

Scale: 0.06 / 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)

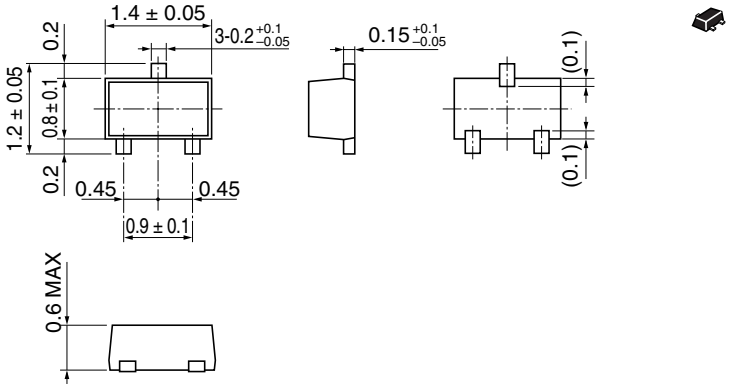
	S11		S21		S12		S22	
f(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.820	–35.7	15.31	156.5	0.027	71.2	0.923	–18.5
200	0.738	–66.6	12.89	137.3	0.045	58.1	0.786	–31.0
300	0.679	–90.5	10.54	123.8	0.056	50.0	0.661	–38.8
400	0.622	–107.1	8.65	114.2	0.062	45.9	0.572	–42.8
500	0.600	–120.6	7.30	106.9	0.066	44.7	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)

	S11		S21		S12		S22	
f(MHz)	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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