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

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2SC5828

Silicon NPN Epitaxial
VHF/UHF Wide band amplifier

RENESAS

ADE-208-1465(Z)

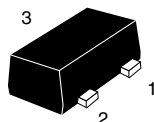
Rev.0
Nov. 2001

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 "WX-".

Absolute Maximum Ratings

(Ta = 25 °C)

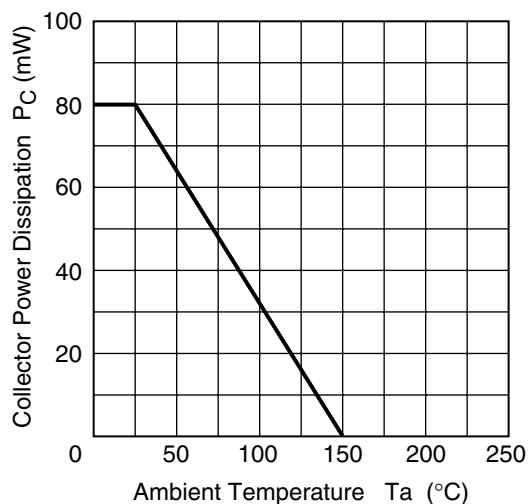
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	5.5	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Collector power dissipation	P_C	80	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Electrical Characteristics

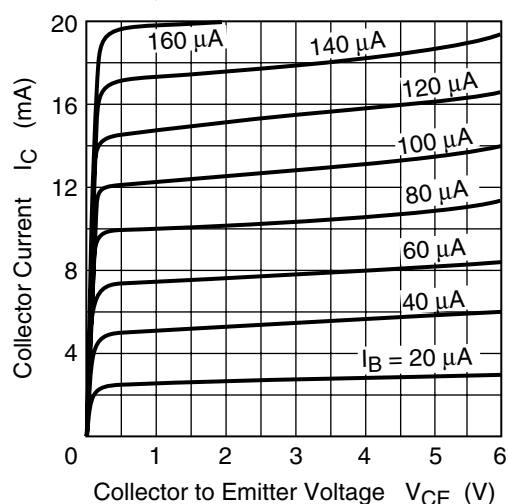
(Ta = 25 °C)

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	2.5	5.5	—	GHz	$V_{CE} = 1 V$, $I_C = 5 mA$
Power gain	PG	11	14	—	dB	$V_{CE} = 1 V$, $I_C = 5 mA$, $f = 900 MHz$
Noise figure	NF	—	1.0	1.7	dB	$V_{CE} = 1 V$, $I_C = 5 mA$, $f = 900 MHz$

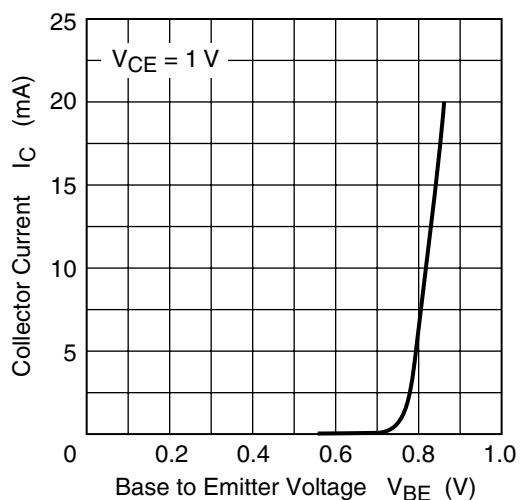
Collector Power Dissipation Curve



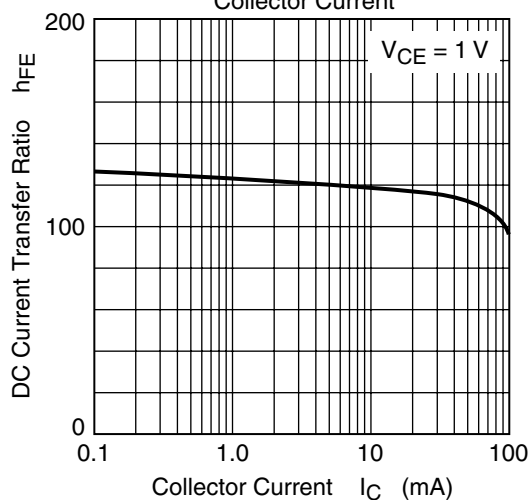
Typical Output Characteristics

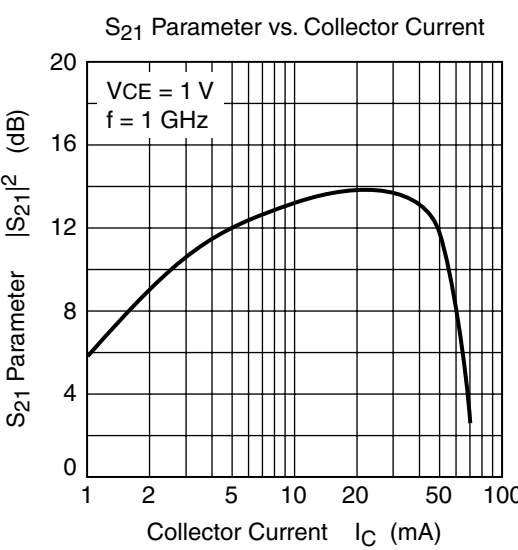
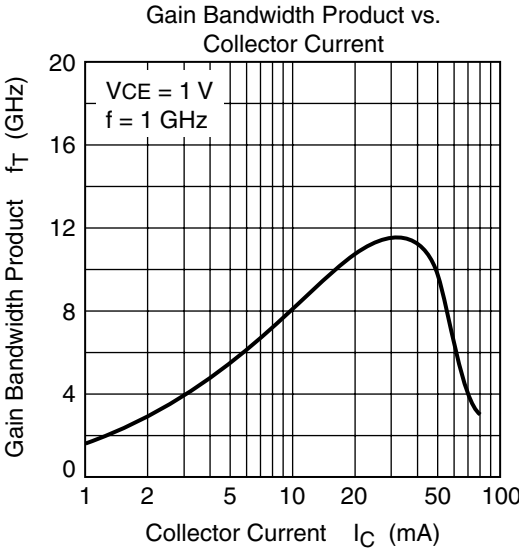
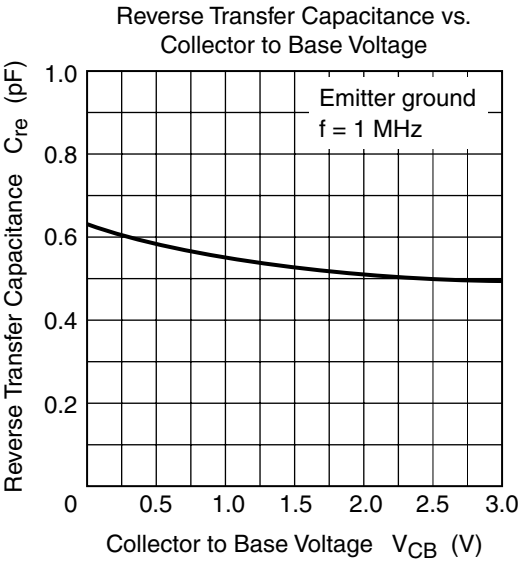
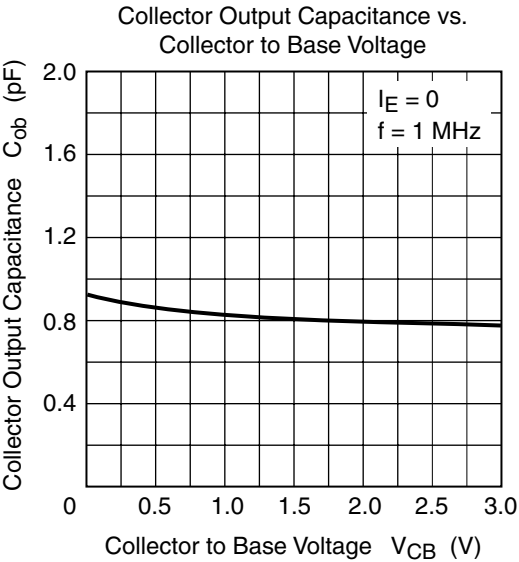


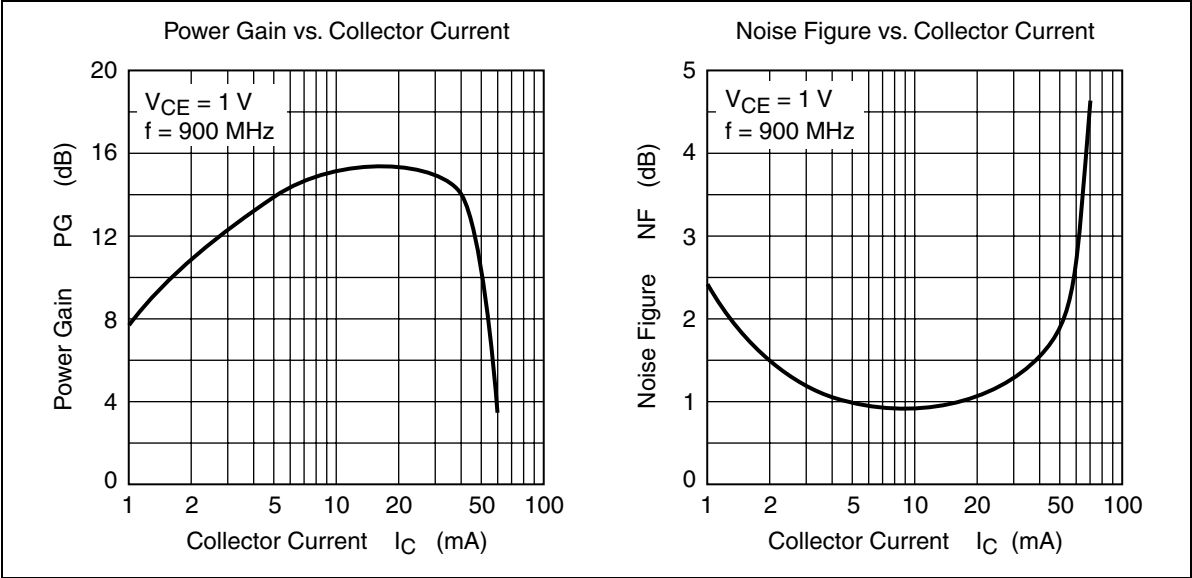
Typical Transfer Characteristics



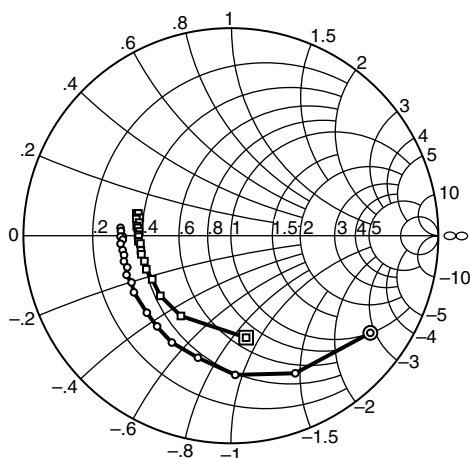
DC Current Transfer Ratio vs. Collector Current







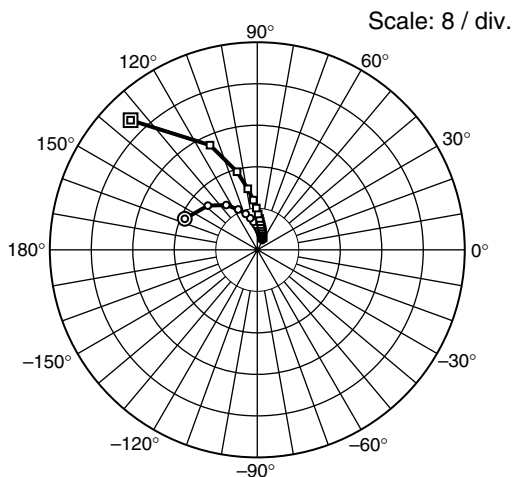
S_{11} Parameter vs. Frequency



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)

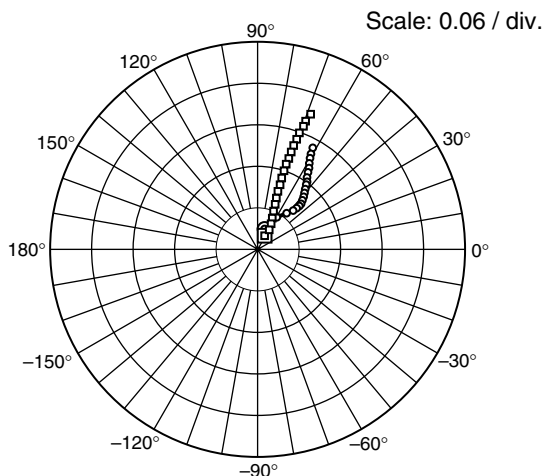
S_{21} Parameter vs. Frequency



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)

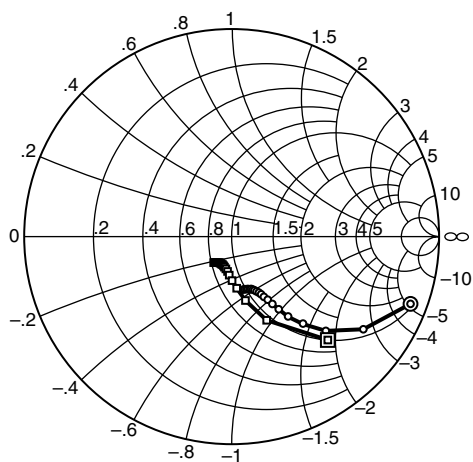
S_{12} Parameter vs. Frequency



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

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.819	-34.8	15.22	156.8	0.031	71.2	0.921	-20.6
200	0.732	-64.9	12.81	138.1	0.054	59.1	0.776	-35.1
300	0.671	-88.2	10.54	124.7	0.067	51.3	0.642	-45.0
400	0.609	-105.1	8.65	115.3	0.076	47.5	0.542	-50.6
500	0.588	-118.9	7.31	107.9	0.082	46.5	0.471	-54.7
600	0.563	-129.1	6.28	102.6	0.087	46.1	0.417	-57.0
700	0.549	-137.5	5.47	97.8	0.091	46.3	0.379	-58.8
800	0.541	-143.8	4.87	93.6	0.096	47.6	0.350	-60.2
900	0.529	-149.7	4.40	90.2	0.101	48.8	0.329	-61.8
1000	0.537	-154.8	4.01	86.9	0.106	50.3	0.312	-62.9
1100	0.522	-159.4	3.67	84.1	0.111	51.7	0.300	-64.0
1200	0.530	-163.0	3.38	81.1	0.117	53.1	0.290	-65.5
1300	0.523	-166.5	3.15	79.0	0.121	53.8	0.281	-66.9
1400	0.526	-169.7	2.94	76.7	0.126	55.5	0.275	-68.1
1500	0.533	-172.4	2.77	74.1	0.133	56.8	0.269	-69.5
1600	0.521	-175.8	2.61	72.2	0.139	57.7	0.268	-71.0
1700	0.532	-177.9	2.46	70.2	0.145	59.0	0.264	-72.7
1800	0.520	-179.5	2.35	67.9	0.152	60.1	0.263	-74.3
1900	0.530	177.6	2.23	66.0	0.158	60.8	0.261	-76.0
2000	0.533	175.9	2.14	63.9	0.167	61.5	0.261	-77.9

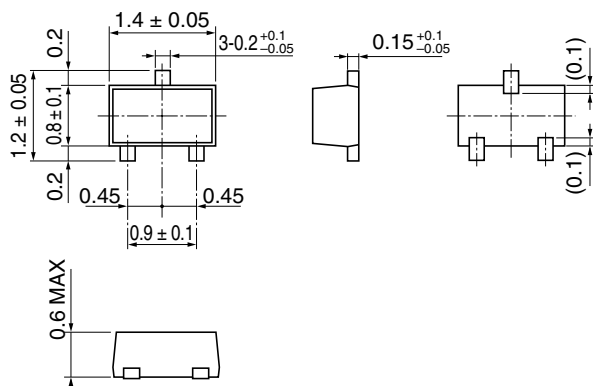
2SC5828

(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	0.496	−81.4	34.91	134.4	0.022	62.9	0.680	−47.1
200	0.455	−121.9	22.12	114.3	0.033	59.6	0.438	−67.3
300	0.446	−139.6	15.54	104.5	0.042	62.4	0.316	−77.8
400	0.433	−151.0	11.90	98.8	0.050	65.0	0.251	−84.4
500	0.438	−158.4	9.60	94.4	0.060	67.5	0.213	−89.4
600	0.434	−163.6	8.04	91.2	0.070	68.8	0.187	−93.5
700	0.440	−168.3	6.91	88.4	0.079	70.0	0.170	−96.6
800	0.439	−170.7	6.05	85.7	0.089	70.8	0.159	−100.0
900	0.437	−175.1	6.45	83.6	0.099	70.9	0.152	−103.1
1000	0.446	−176.6	4.92	81.6	0.109	71.4	0.147	−105.3
1100	0.444	−179.5	4.48	79.3	0.120	71.5	0.143	−107.8
1200	0.447	179.3	4.10	77.1	0.130	71.5	0.142	−110.2
1300	0.441	177.3	3.83	75.7	0.139	71.1	0.140	−112.5
1400	0.450	175.1	3.56	74.0	0.149	71.0	0.140	−114.4
1500	0.456	174.1	3.34	72.0	0.159	70.9	0.141	−116.2
1600	0.446	171.8	3.14	70.5	0.169	70.5	0.143	−117.8
1700	0.462	169.9	2.96	68.8	0.179	70.3	0.145	−119.4
1800	0.447	168.8	2.81	67.2	0.190	69.6	0.148	−121.2
1900	0.458	166.4	2.68	65.8	0.198	69.5	0.150	−122.7
2000	0.468	166.7	2.55	64.1	0.210	68.6	0.153	−124.4

Package Dimensions

As of July, 2001
Unit: mm



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

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