

2SC5758

Silicon NPN Epitaxial
VHF / UHF Wide band amplifier

HITACHI

ADE-208-1397D(Z)

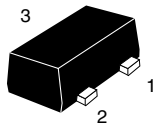
Rev.4
Jul. 2001

Features

- Super compact package: MPAK (1.4 x 0.8 x 0.59 mm)

Outline

MPAK



1. Emitter
2. Base
3. Collector

Note: Marking is "WF-".

Absolute Maximum Ratings

(Ta = 25°C)

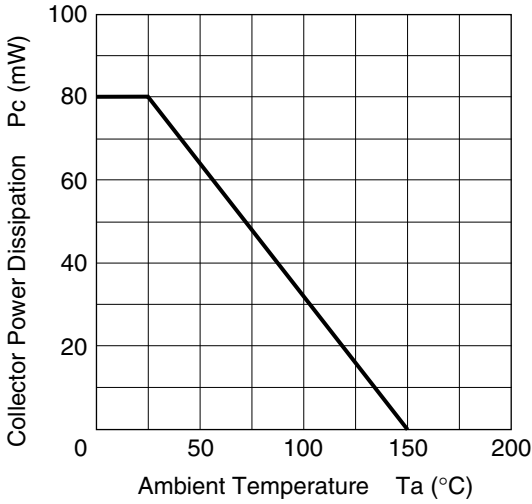
Item	Symbol	Ratings	Unit
Collector to base voltage	V _{CBO}	10	V
Collector to emitter voltage	V _{CEO}	3.5	V
Emitter to base voltage	V _{EBO}	1.5	V
Collector current	I _C	80	mA
Collector power dissipation	P _C	80	mW
Junction temperature	T _J	150	°C
Storage temperature	T _{stg}	-50 to +150	°C

Electrical Characteristics

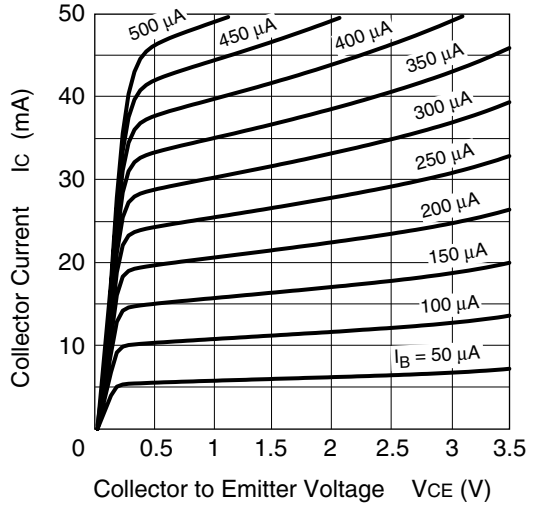
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	V _{(BR)CBO}	10	—	—	V	I _C = 10 μA, I _E = 0
Collector cutoff current	I _{CBO}	—	—	600	nA	V _{CB} = 10 V, I _E = 0
Collector cutoff current	I _{CEO}	—	—	200	nA	V _{CE} = 3.5 V, R _{BE} = Infinite
Emitter cutoff current	I _{EBO}	—	—	100	nA	V _{EB} = 1.5 V, I _C = 0
DC current transfer ratio	h _{FE}	80	100	130	V	V _{CB} = 1 V, I _C = 5 mA
Collector output capacitance	C _{ob}	0.65	0.95	1.25	pF	V _{CB} = 1 V, I _E = 0, f = 1 MHz
Gain bandwidth product	f _T	6	8	—	GHz	V _{CE} = 1 V, I _C = 5 mA
Power gain	PG	10	13	—	dB	V _{CE} = 1 V, I _C = 5 mA, f = 900 MHz
Noise figure	NF	—	1.0	2.0	dB	V _{CE} = 1 V, I _C = 5 mA, f = 900 MHz

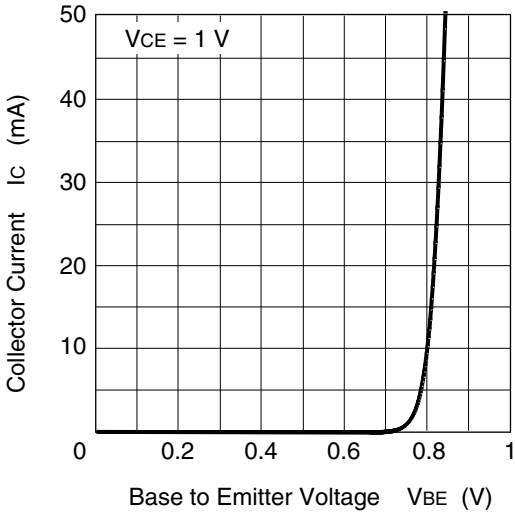
Collector Power Dissipation Curve



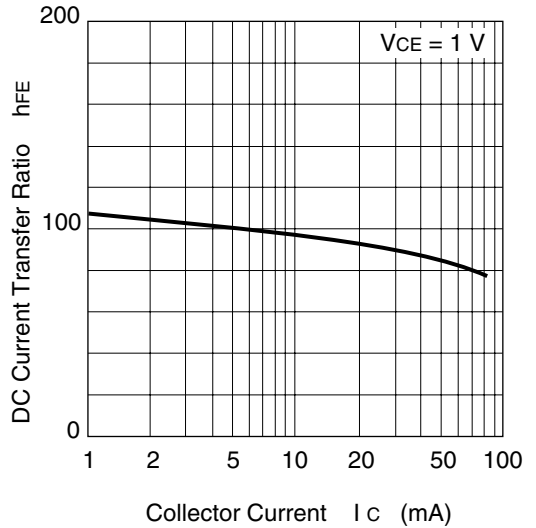
Typical Output Characteristics



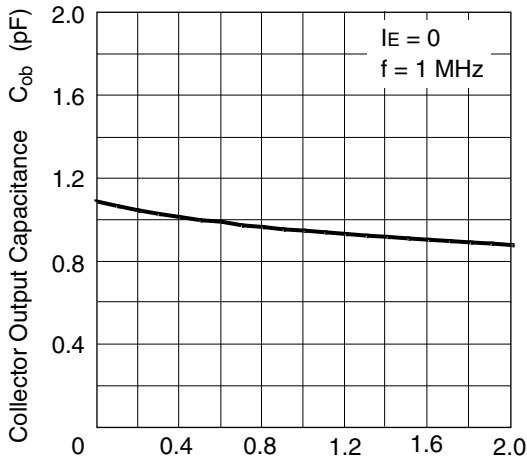
Typical Transfer Characteristics



DC Current Transfer Ratio vs. Collector Current

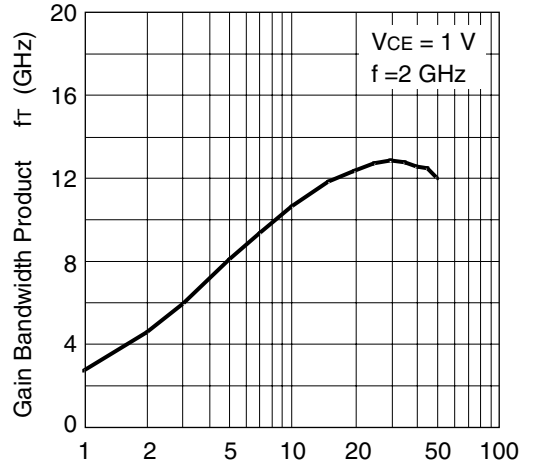


Collector Output Capacitance vs. Collector to Base Voltage



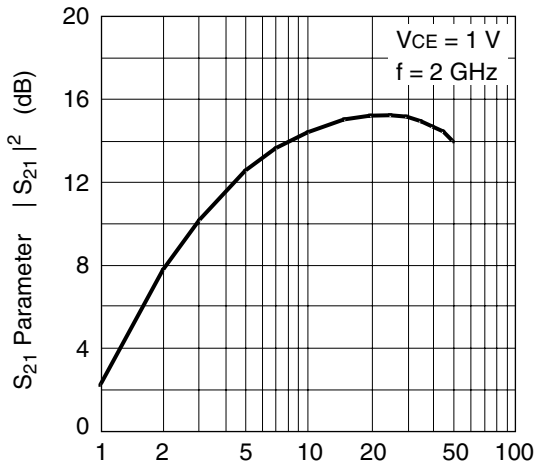
Collector to Base Voltage V_{CB} (V)

Gain Bandwidth Product vs. Collector Current



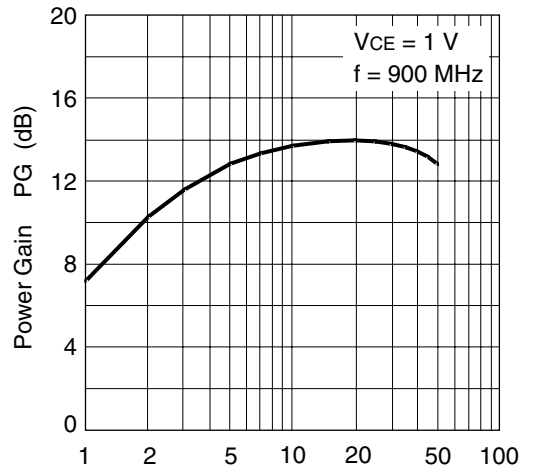
Collector Current I_c (mA)

S_{21} Parameter vs. Collector Current

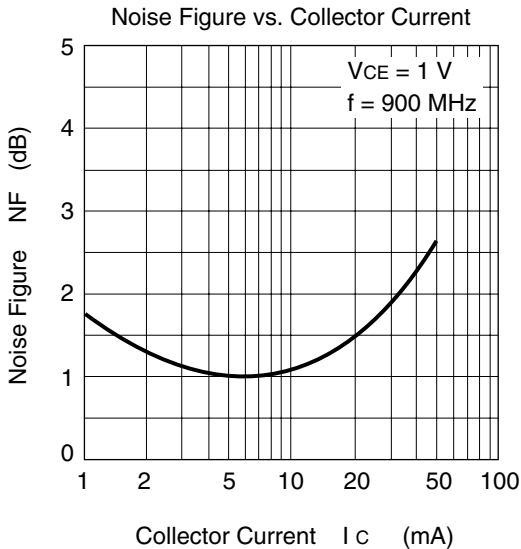


Collector Current I_c (mA)

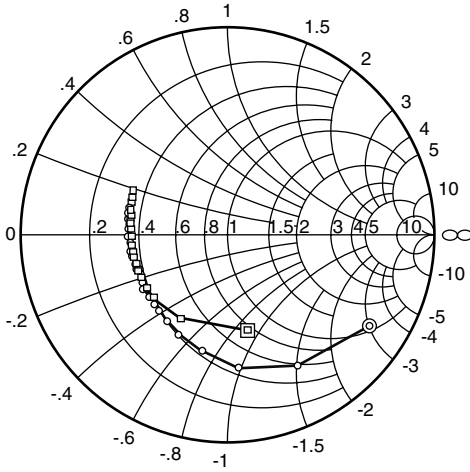
Power Gain vs. Collector Current



Collector Current I_c (mA)



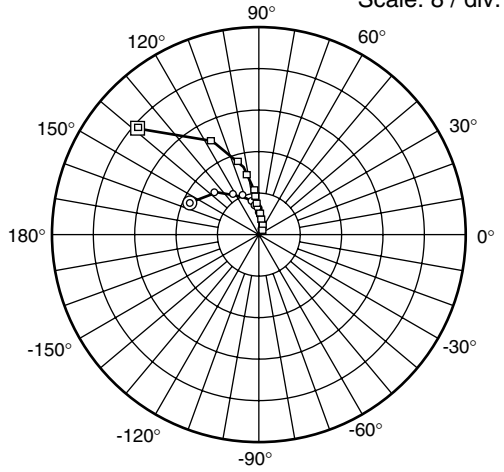
S₁₁ Parameter vs. Frequency



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

S₂₁ Parameter vs. Frequency

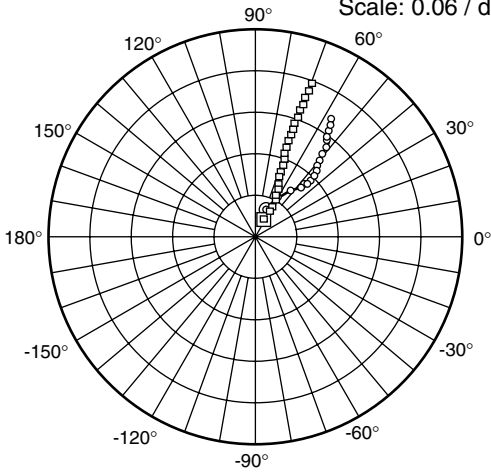
Scale: 8 / div.



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

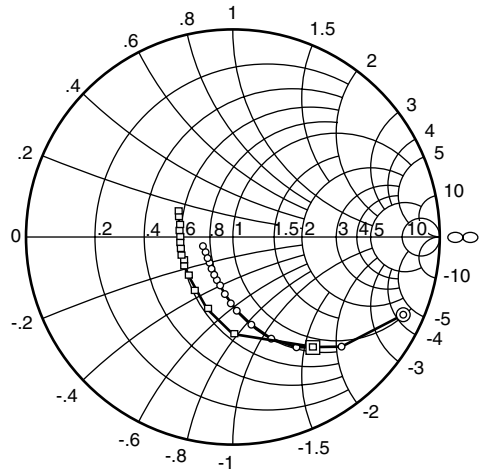
S₁₂ Parameter vs. Frequency

Scale: 0.06 / div.



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

S₂₂ Parameter vs. Frequency



Condition: 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	0.806	-31.9	14.60	157.6	0.038	72.8	0.901	-24.3
200	0.713	-61.5	12.31	138.9	0.067	59.5	0.757	-44.8
300	0.635	-85.3	10.02	125.3	0.085	51.3	0.610	-60.1
400	0.560	-102.7	8.22	115.4	0.096	47.2	0.501	-70.9
500	0.529	-117.1	6.94	108.4	0.104	45.5	0.421	-79.8
600	0.500	-127.8	5.97	103.1	0.111	44.6	0.360	-87.2
700	0.486	-137.2	5.20	98.6	0.117	44.8	0.314	-93.1
800	0.474	-144.1	4.65	94.6	0.123	45.7	0.278	-99.7
900	0.467	-151.1	4.14	91.7	0.129	46.7	0.249	-105.1
1000	0.466	-157.1	3.77	88.4	0.135	47.7	0.226	-110.9
1100	0.461	-162.4	3.45	85.9	0.141	48.6	0.208	-116.0
1200	0.464	-166.1	3.19	83.4	0.147	49.7	0.194	-121.4
1300	0.464	-169.9	2.99	81.3	0.153	51.0	0.181	-127.1
1400	0.467	-173.8	2.78	79.1	0.159	51.8	0.172	-131.7
1500	0.465	-177.2	2.62	77.3	0.166	53.0	0.165	-137.5
1600	0.476	179.9	2.46	75.2	0.174	53.8	0.159	-141.6
1700	0.480	177.4	2.36	73.4	0.180	54.7	0.155	-147.4
1800	0.480	173.4	2.24	71.8	0.187	55.6	0.154	-152.9
1900	0.490	172.0	2.14	70.2	0.195	56.5	0.154	-157.6
2000	0.487	169.3	2.06	68.6	0.202	57.0	0.153	-162.5

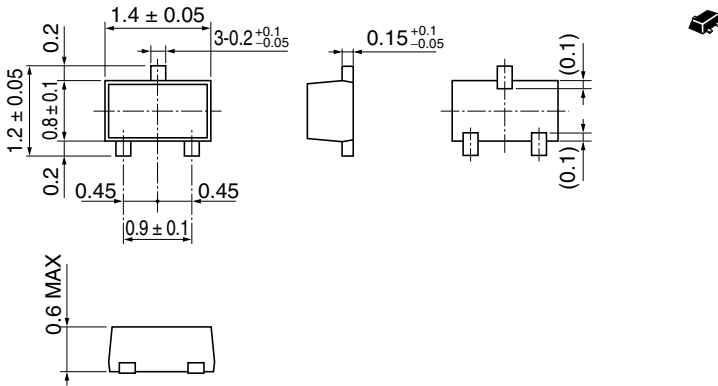
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($V_{CE} = 1 \text{ V}$, $I_C = 20 \text{ mA}$, $Z_o = 50 \Omega$)

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.487	-78.2	31.25	138.4	0.026	64.0	0.679	-53.9
200	0.466	-120.9	20.22	117.0	0.040	57.9	0.469	-87.5
300	0.465	-141.6	14.16	106.4	0.050	58.9	0.362	-109.1
400	0.459	-154.5	10.81	100.4	0.060	61.5	0.311	-124.4
500	0.461	-161.8	8.74	96.1	0.070	63.7	0.283	-135.8
600	0.462	-168.1	7.34	92.9	0.080	65.8	0.268	-145.4
700	0.468	-172.8	6.30	90.2	0.091	67.1	0.258	-153.2
800	0.468	-176.5	5.56	87.7	0.101	68.3	0.253	-159.6
900	0.474	179.1	4.93	85.7	0.113	69.0	0.249	-165.5
1000	0.473	176.8	4.46	83.7	0.124	69.5	0.249	-170.7
1100	0.478	173.5	4.07	82.2	0.135	69.8	0.249	-175.1
1200	0.486	170.7	3.75	80.3	0.145	70.2	0.251	-179.3
1300	0.477	168.8	3.51	78.8	0.156	70.2	0.251	176.9
1400	0.493	166.3	3.26	77.2	0.167	70.1	0.254	173.5
1500	0.493	163.6	3.07	75.9	0.179	70.4	0.256	170.4
1600	0.502	161.7	2.88	74.5	0.189	70.4	0.260	167.6
1700	0.506	160.8	2.74	73.2	0.201	70.2	0.263	164.8
1800	0.511	157.7	2.62	72.0	0.211	69.8	0.268	162.1
1900	0.517	156.4	2.49	70.7	0.222	69.9	0.275	159.6
2000	0.523	154.5	2.40	69.5	0.232	69.4	0.280	157.1

Package Dimensions

As of January, 2001
Unit: mm



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

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