2SC5758

Silicon NPN Epitaxial
VHF / UHF Wide band amplifier

HITACHI

ADE-208-1397D(Z)

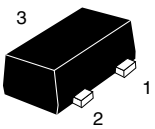
Rev.4
Jul. 2001

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 “WF–“.

Hitachi semiconductor

Absolute Maximum Ratings

(Ta = 25°C)

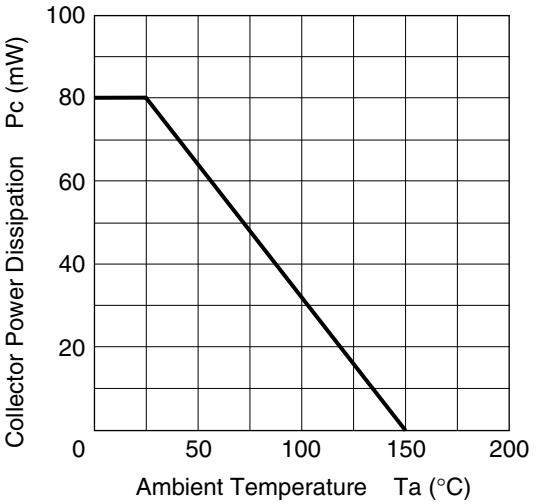
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	10	V
Collector to emitter voltage	V_{CEO}	3.5	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Collector power dissipation	P_C	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–50 to +150	°C

Electrical Characteristics

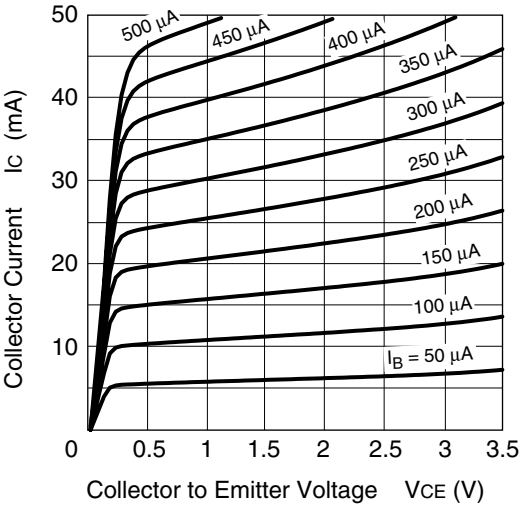
(Ta = 25°C)

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

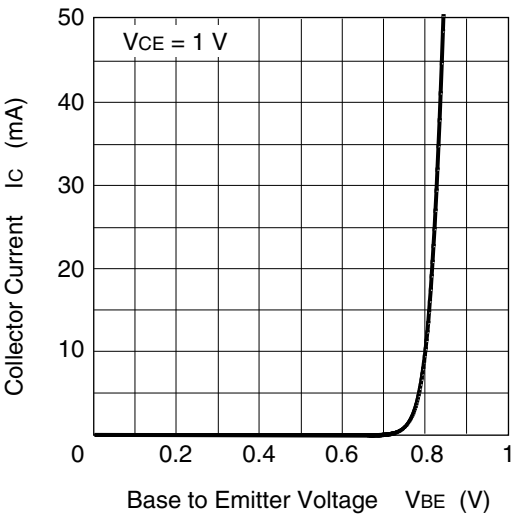
Collector Power Dissipation Curve



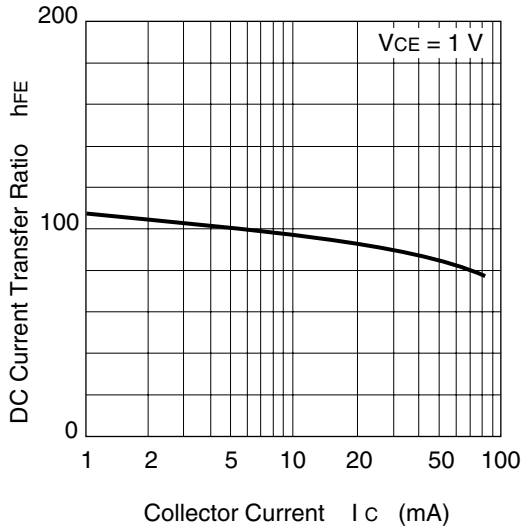
Typical Output Characteristics



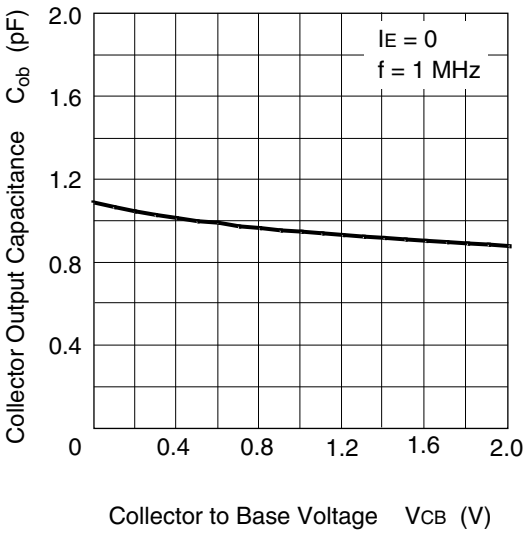
Typical Transfer Characteristics



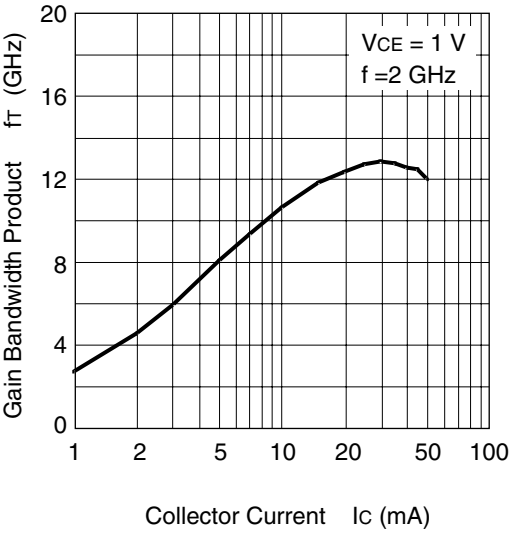
DC Current Transfer Ratio vs. Collector Current



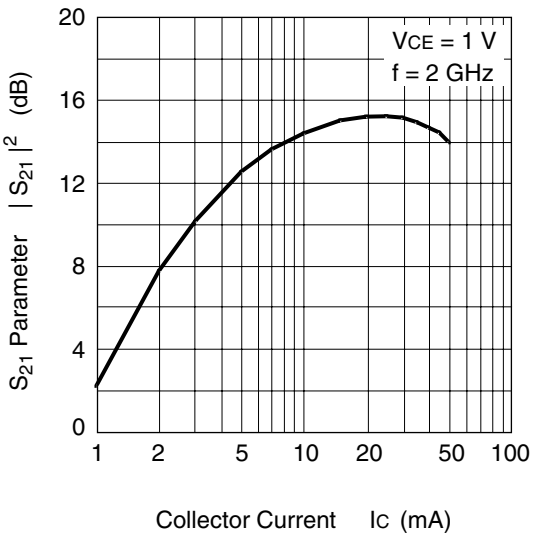
Collector Output Capacitance vs. Collector to Base Voltage



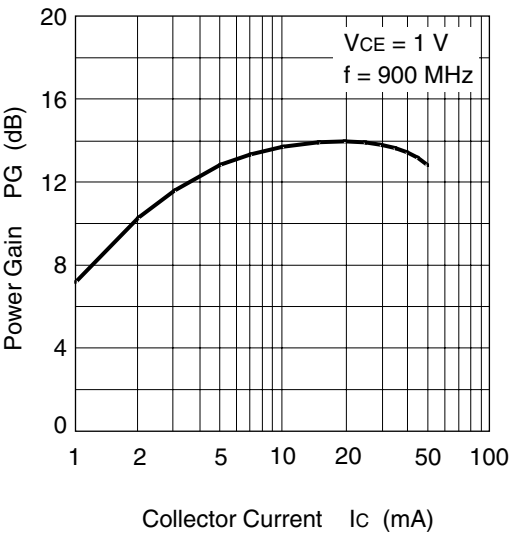
Gain Bandwidth Product vs. Collector Current



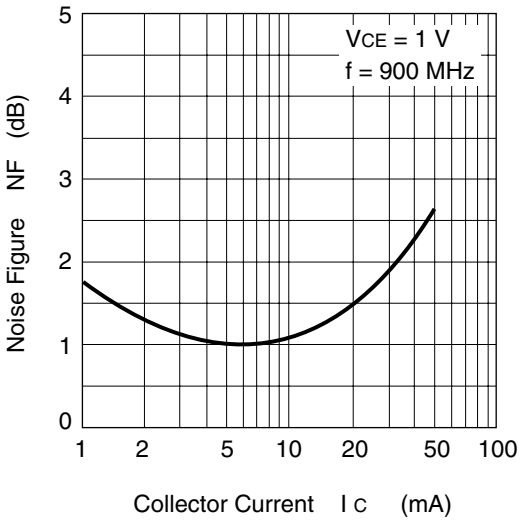
S_{21} Parameter vs. Collector Current



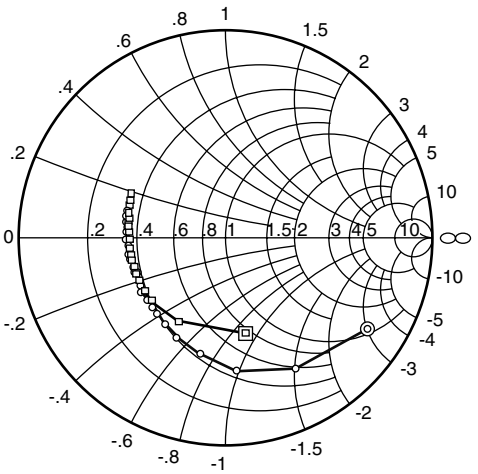
Power Gain vs. Collector Current



Noise Figure vs. Collector Current



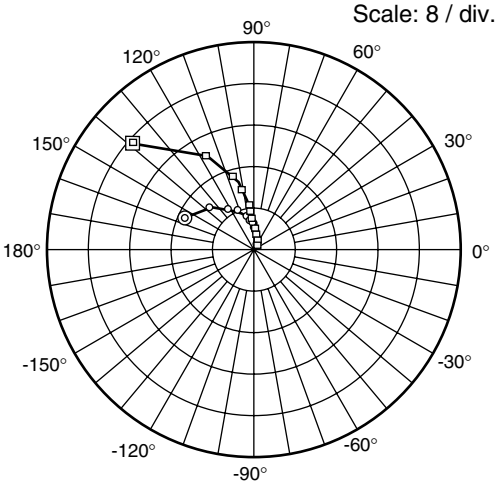
S_{11} Parameter vs. Frequency



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_{21} Parameter vs. Frequency

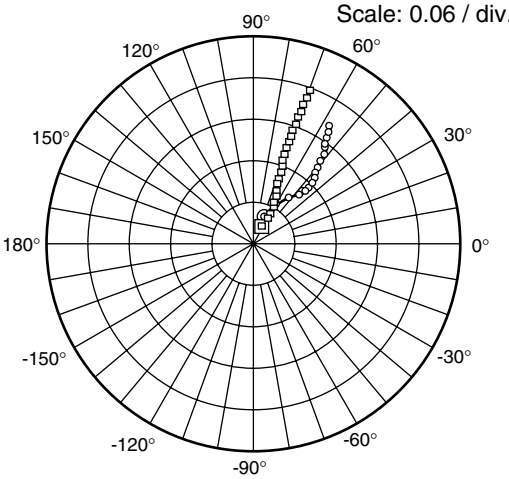
Scale: 8 / div.



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

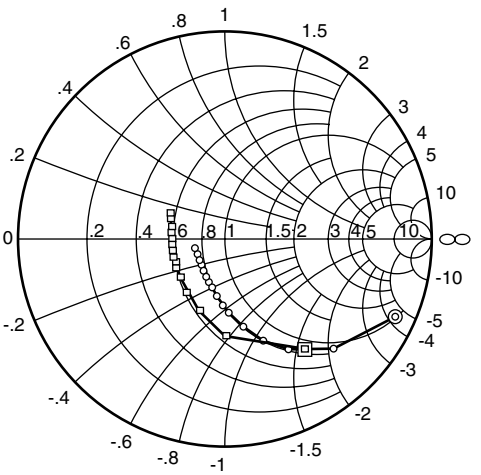
S_{12} Parameter vs. Frequency

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)

S_{22} 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 V, I_C = 5 mA, Z_O = 50 Ω)

	S11		S21		S12		S22	
f(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.806	–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

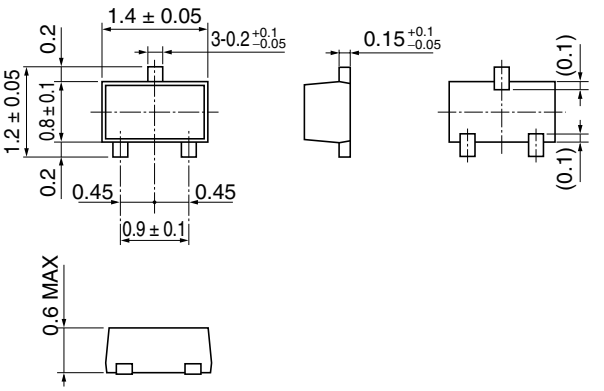
(V_{CE} = 1 V, I_C = 20 mA, Z_O =50 Ω)

	S11		S21		S12		S22	
f(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.487	–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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