

# 2SC5757

Silicon NPN Epitaxial  
VHF/UHF wide band amplifier

# HITACHI

ADE-208-1396D (Z)

Rev.4  
Jul. 2001

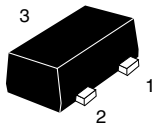
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## Features

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

## Outline

MPAK



1. Emitter
2. Base
3. Collector

Note: Marking is "WE-".

**Absolute Maximum Ratings**

(Ta = 25 °C)

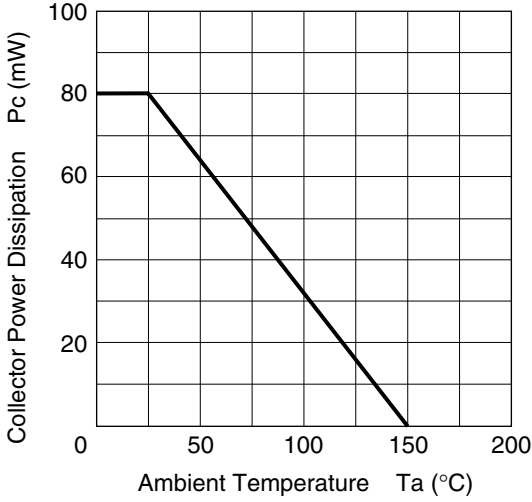
Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	10	V
Collector to emitter voltage	$V_{CEO}$	3.5	V
Emitter to base voltage	$V_{EBO}$	1.5	V
Collector current	$I_C$	80	mA
Collector power dissipation	Pc	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	-55 to +150	°C

**Electrical Characteristics**

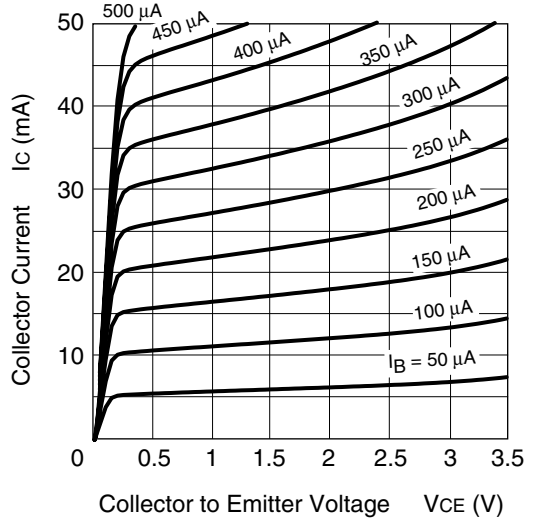
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	10	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector cutoff current	$I_{CBO}$	—	—	600	nA	$V_{CB} = 10 V, I_E = 0$
Collector cutoff current	$I_{CEO}$	—	—	200	nA	$V_{CE} = 3.5 V, R_{BE} = \text{Infinite}$
Emitter cutoff current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 1.5 V, I_C = 0$
DC current transfer ratio	$h_{FE}$	80	100	130	—	$V_{CE} = 1 V, I_C = 5 mA$
Collector output capacitance	$C_{ob}$	0.9	1.2	1.5	pF	$V_{CB} = 1 V, I_E = 0, f = 1 MHz$
Gain bandwidth product	$f_T$	4.5	6.5	—	GHz	$V_{CE} = 1 V, I_C = 5 mA$
Power gain	PG	8	11	—	dB	$V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz$
Noise figure	NF	—	1.1	2.0	dB	$V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz$

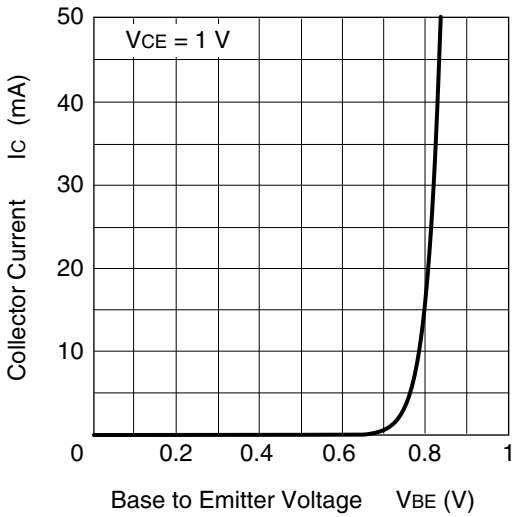
Collector Power Dissipation Curve



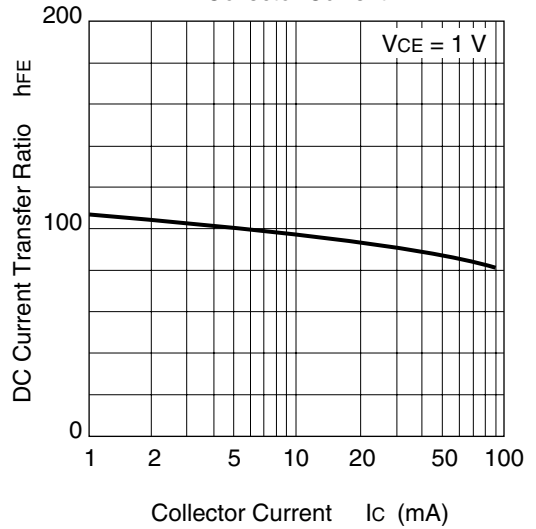
Typical Output Characteristics

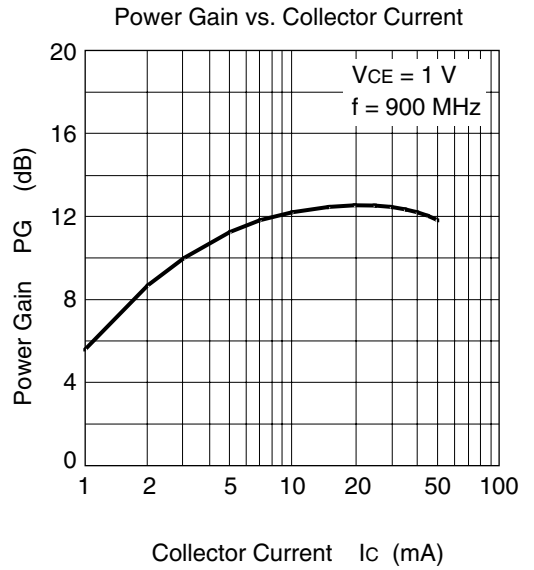
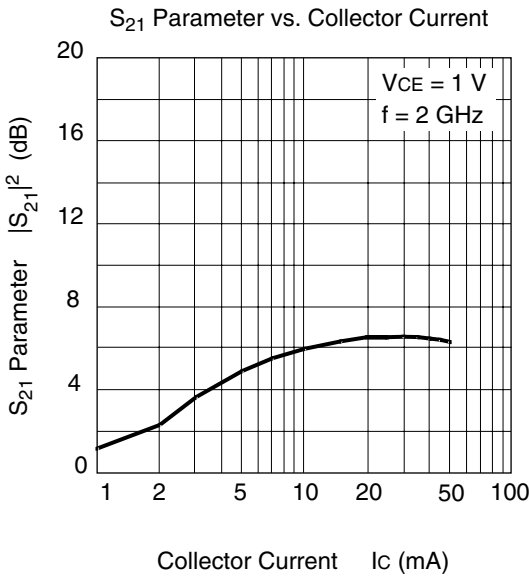
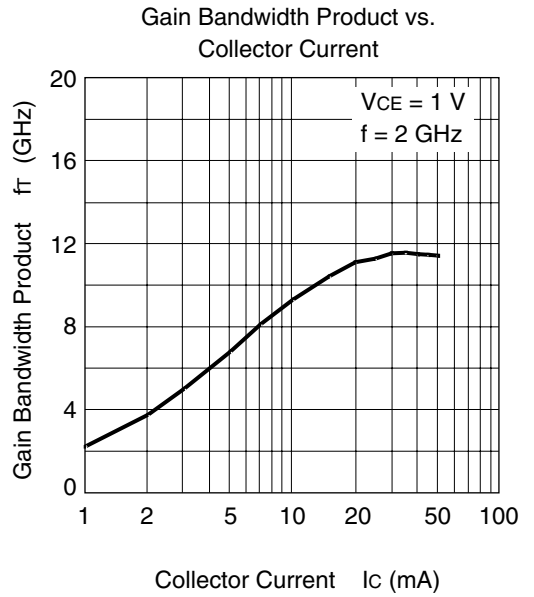
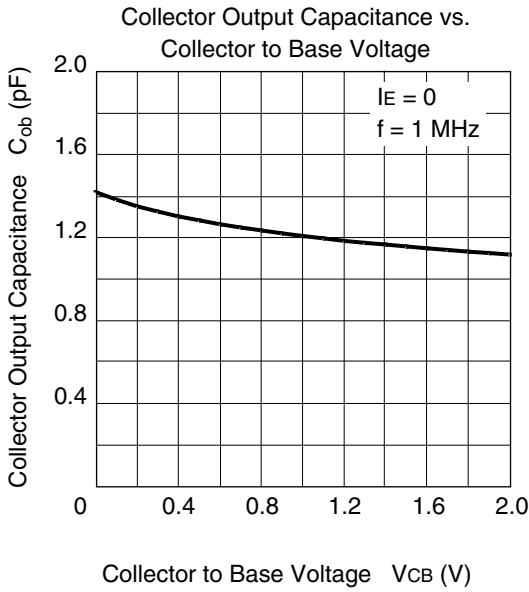


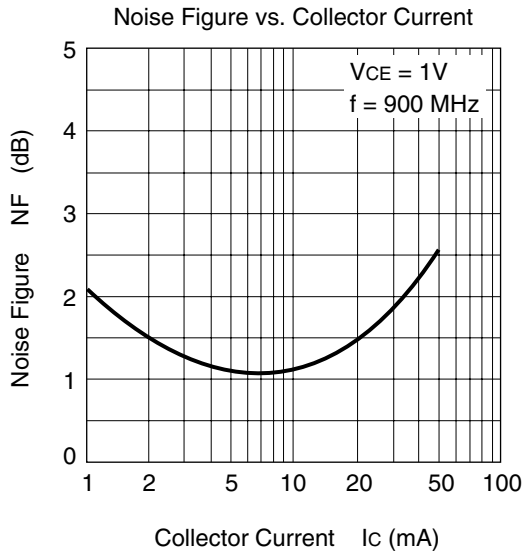
Typical Transfer Characteristics



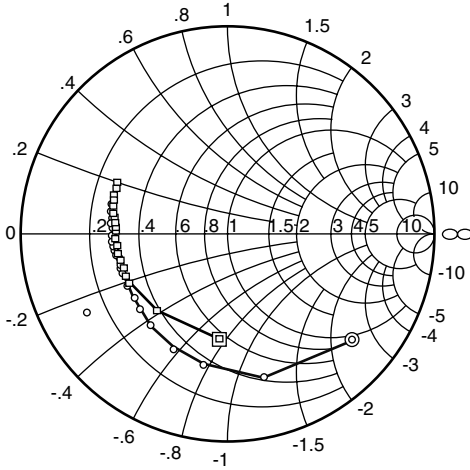
DC Current Transfer Ratio vs. Collector Current





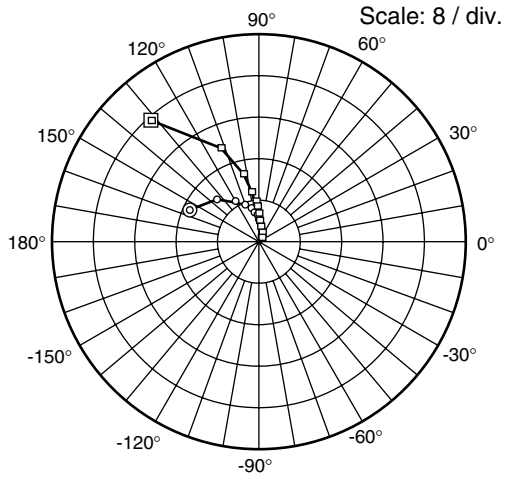


S<sub>11</sub> Parameter vs. Frequency



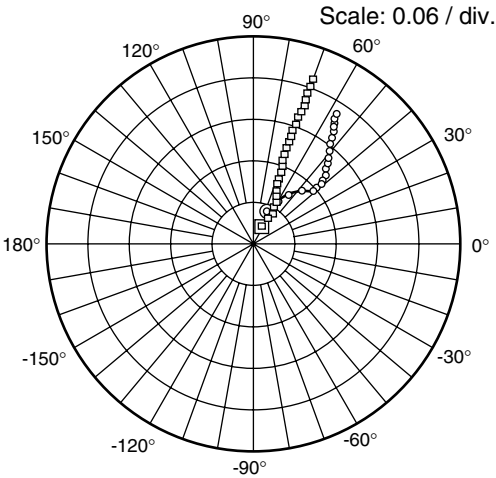
Condition: V<sub>CE</sub> = 1 V, Z<sub>O</sub> = 50 Ω  
 100 to 2000 MHz (100 MHz Step)  
 ○—○ (I<sub>C</sub> = 5 mA)  
 □—□ (I<sub>C</sub> = 20 mA)

S<sub>21</sub> Parameter vs. Frequency



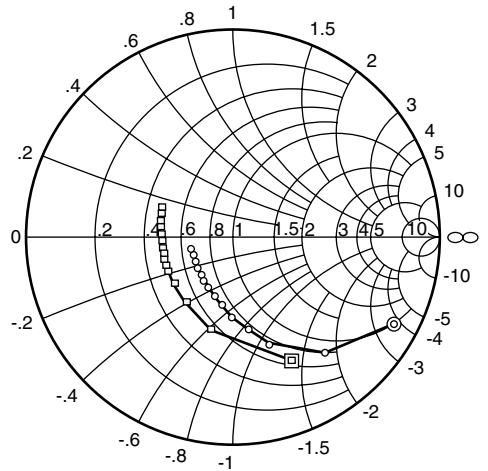
Condition: V<sub>CE</sub> = 1 V, Z<sub>O</sub> = 50 Ω  
 100 to 2000 MHz (100 MHz Step)  
 ○—○ (I<sub>C</sub> = 5 mA)  
 □—□ (I<sub>C</sub> = 20 mA)

S<sub>12</sub> Parameter vs. Frequency



Condition: V<sub>CE</sub> = 1 V, Z<sub>O</sub> = 50 Ω  
 100 to 2000 MHz (100 MHz Step)  
 ○—○ (I<sub>C</sub> = 5 mA)  
 □—□ (I<sub>C</sub> = 20 mA)

S<sub>22</sub> Parameter vs. Frequency



Condition: V<sub>CE</sub> = 1 V, Z<sub>O</sub> = 50 Ω  
 100 to 2000 MHz (100 MHz Step)  
 ○—○ (I<sub>C</sub> = 5 mA)  
 □—□ (I<sub>C</sub> = 20 mA)

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

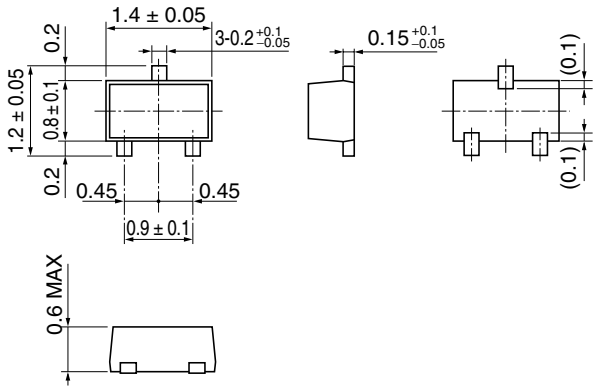
f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.797	-40.0	14.26	154.3	0.048	69.8	0.881	-28.5
200	0.695	-75.2	11.44	133.4	0.081	54.5	0.709	-52.2
300	0.638	-100.7	9.03	119.6	0.099	46.6	0.559	-69.4
400	0.594	-117.6	7.23	110.7	0.109	42.7	0.457	-81.5
500	0.571	-130.8	6.00	103.8	0.116	41.1	0.388	-91.3
600	0.558	-140.3	5.13	98.8	0.122	41.1	0.336	-99.7
700	0.548	-148.5	4.43	94.6	0.128	41.2	0.300	-107.0
800	0.545	-154.4	3.93	90.9	0.134	42.6	0.274	-113.5
900	0.539	-160.1	3.52	88.0	0.139	43.6	0.254	-120.0
1000	0.541	-164.6	3.20	85.0	0.145	45.0	0.238	-125.7
1100	0.542	-169.1	2.93	82.5	0.150	46.3	0.227	-130.8
1200	0.543	-171.9	2.71	80.2	0.156	48.1	0.221	-135.9
1300	0.546	-175.6	2.53	77.9	0.163	49.1	0.213	-141.1
1400	0.546	-178.4	2.36	75.6	0.169	50.5	0.209	-144.8
1500	0.552	179.4	2.23	73.8	0.176	51.8	0.207	-149.5
1600	0.558	176.4	2.10	71.6	0.183	52.8	0.205	-153.0
1700	0.558	174.2	2.00	70.1	0.191	54.0	0.206	-156.9
1800	0.570	171.7	1.90	68.5	0.198	55.0	0.207	-160.7
1900	0.577	169.6	1.81	66.6	0.206	56.1	0.210	-163.9
2000	0.578	167.8	1.75	65.3	0.214	56.7	0.212	-167.7

$(V_{CB} = 1\text{ V}, I_C = 20\text{ mA}, Z_0 = 50\ \Omega)$ 

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.512	-94.1	30.18	133.2	0.031	60.2	0.643	-66.8
200	0.523	-134.9	18.31	112.6	0.044	54.5	0.459	-104.5
300	0.531	-151.8	12.60	102.9	0.054	57.1	0.386	-126.5
400	0.533	-161.4	9.53	97.8	0.065	60.5	0.355	-140.6
500	0.540	-168.0	7.67	93.7	0.076	63.2	0.341	-150.2
600	0.539	-172.3	6.43	90.7	0.088	65.5	0.333	-157.8
700	0.541	-176.7	5.49	88.2	0.100	66.6	0.330	-163.7
800	0.543	-179.7	4.83	86.0	0.111	67.8	0.328	-168.7
900	0.545	177.0	4.30	84.3	0.123	68.4	0.328	-172.9
1000	0.547	174.3	3.91	82.1	0.135	69.1	0.329	-176.7
1100	0.550	171.8	3.57	80.6	0.148	69.5	0.329	-180.0
1200	0.552	170.0	3.29	79.0	0.159	69.9	0.332	176.9
1300	0.557	167.3	3.05	77.5	0.172	69.8	0.334	174.2
1400	0.566	165.5	2.87	75.8	0.184	70.0	0.336	171.5
1500	0.570	163.7	2.68	74.4	0.197	70.0	0.339	169.2
1600	0.569	162.0	2.54	73.2	0.208	69.9	0.341	167.1
1700	0.570	160.2	2.41	71.4	0.220	69.5	0.345	164.7
1800	0.580	158.3	2.29	70.8	0.233	69.2	0.350	162.8
1900	0.588	157.6	2.19	69.2	0.244	69.4	0.355	161.0
2000	0.587	154.9	2.12	68.0	0.256	69.1	0.360	158.8

Package Dimensions

As of January, 2001  
Unit: mm



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

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