
2SC5623

Silicon NPN Epitaxial High Frequency Low Noise Amplifier

HITACHI

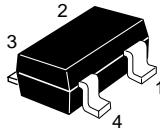
ADE-208-977 (Z)
1st. Edition
Nov. 2000

Features

- High gain bandwidth product
 $f_T = 26$ GHz typ.
- High power gain and low noise figure ;
PG = 18 dB typ. , NF = 1.8 dB typ. at $f = 1.8$ GHz

Outline

CMPAK-4



1. Emitter
2. Collector
3. Emitter
4. Base

Note: Marking is "WH-".

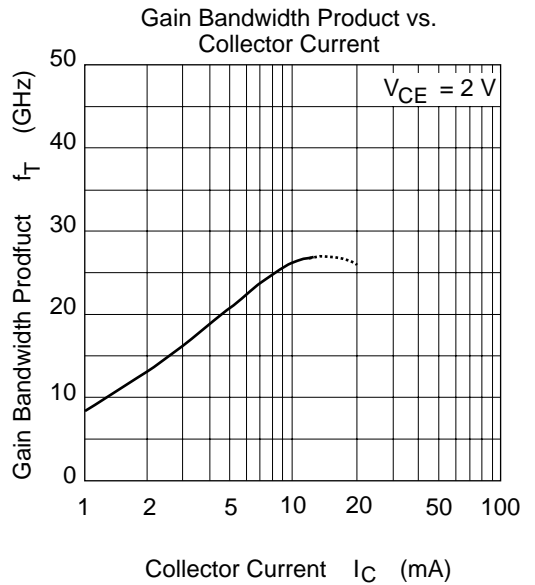
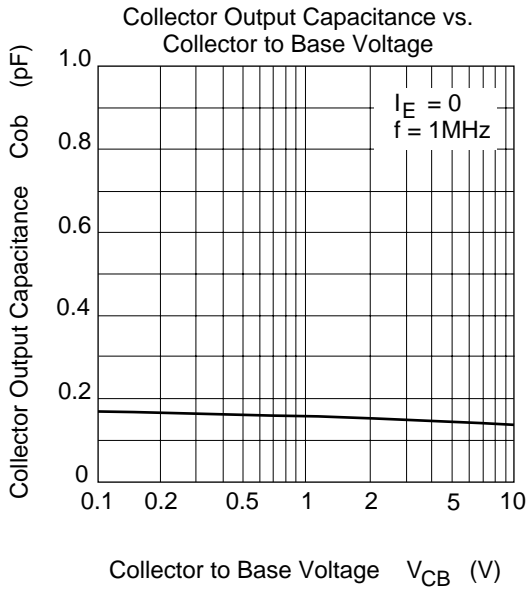
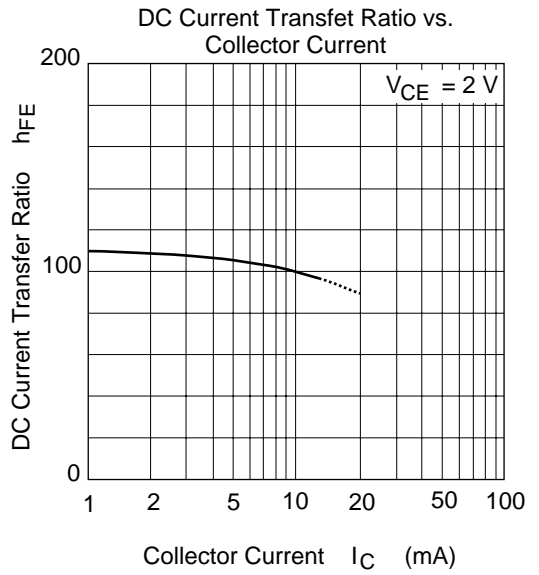
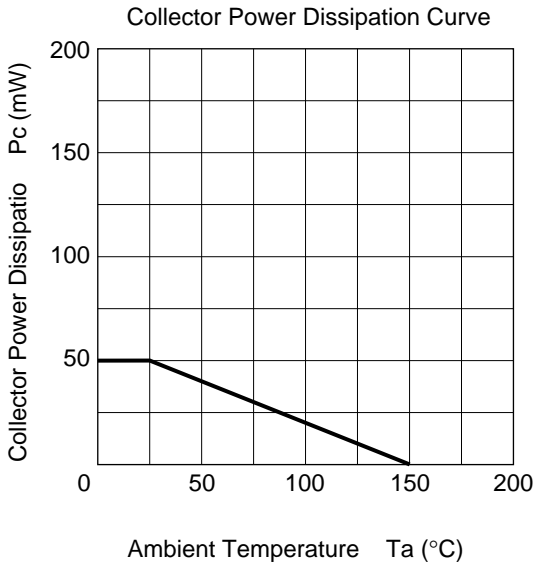
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

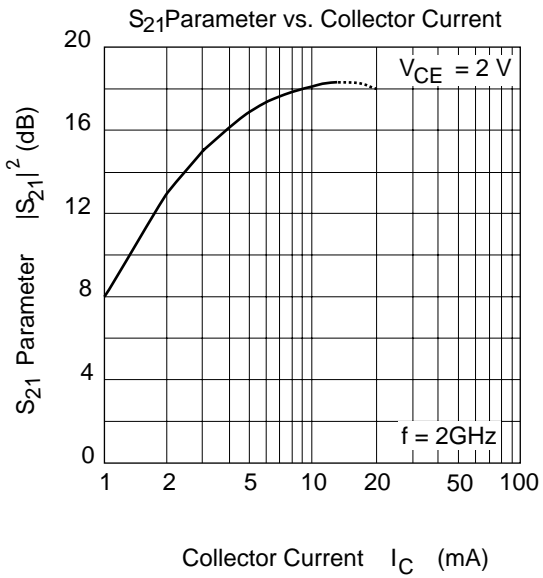
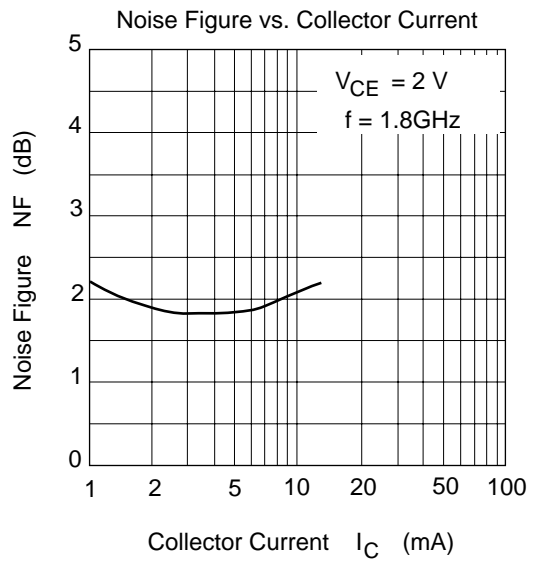
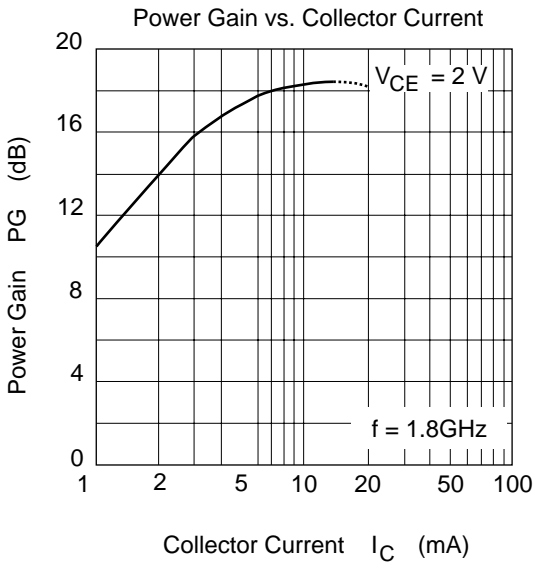
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	10	V
Collector to emitter voltage	V_{CEO}	3.5	V
Emitter to base voltage	V_{EBO}	1	V
Collector current	I_{C}	12	mA
Collector power dissipation	P_{C}	50	mW
Junction temperature	T_{J}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

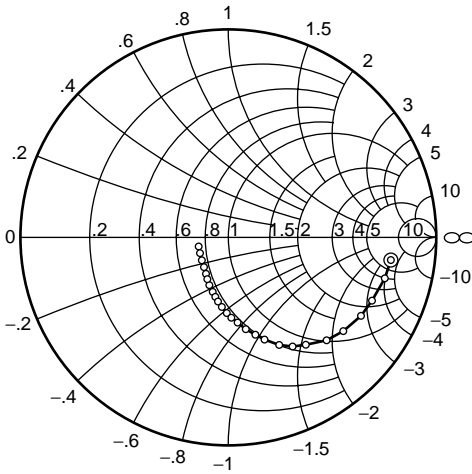
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector to base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	10	—	—	V	$I_{\text{C}} = 10 \mu\text{A}$, $I_{\text{E}} = 0$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{\text{CB}} = 8 \text{ V}$, $I_{\text{E}} = 0$
Collector cutoff current	I_{CEO}	—	—	1	μA	$V_{\text{CE}} = 3 \text{ V}$, $R_{\text{BE}} = \infty$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{\text{EB}} = 1 \text{ V}$, $I_{\text{C}} = 0$
DC current transfer ratio	h_{FE}	60	100	140	V	$V_{\text{CE}} = 2 \text{ V}$, $I_{\text{C}} = 10 \text{ mA}$
Collector output capacitance	C_{ob}	—	0.15	0.4	pF	$V_{\text{CB}} = 2 \text{ V}$, $I_{\text{E}} = 0$ $f = 1 \text{ MHz}$
Gain bandwidth product	f_{T}	23	26	—	GHz	$V_{\text{CE}} = 2 \text{ V}$, $I_{\text{C}} = 10 \text{ mA}$ $f = 2 \text{ GHz}$
Power gain	PG	14	18	—	dB	$V_{\text{CE}} = 2 \text{ V}$, $I_{\text{C}} = 10 \text{ mA}$ $f = 1.8 \text{ GHz}$
Noise figure	NF	—	1.8	2.3	dB	$V_{\text{CE}} = 2 \text{ V}$, $I_{\text{C}} = 3 \text{ mA}$ $f = 1.8 \text{ GHz}$

Main Characteristics





S11 Parameter vs. Frequency

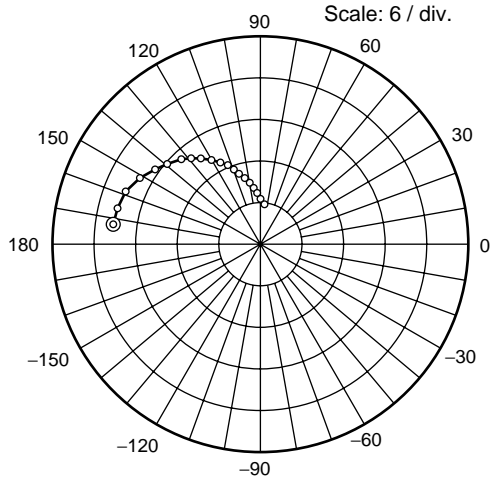


Condition : $V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$

100 to 3000 MHz (100 MHz step)

⊙—○

S21 Parameter vs. Frequency

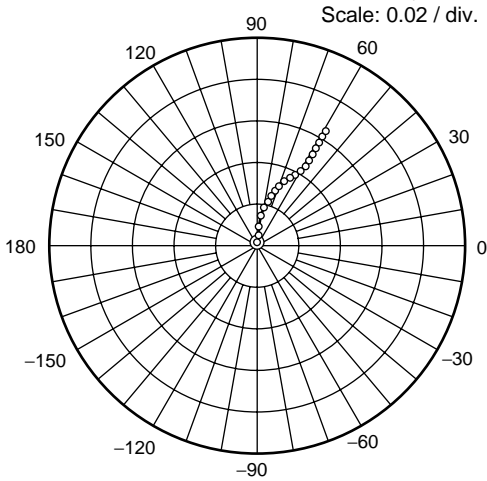


Condition : $V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$

100 to 3000 MHz (100 MHz step)

⊙—○

S12 Parameter vs. Frequency

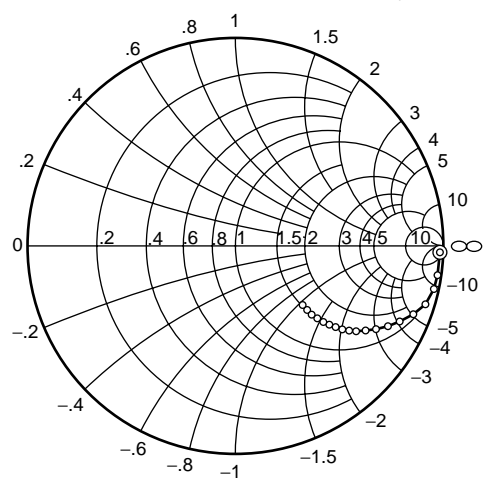


Condition : $V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$

100 to 3000 MHz (100 MHz step)

⊙—○

S22 Parameter vs. Frequency



Condition : $V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$

100 to 3000 MHz (100 MHz step)

⊙—○

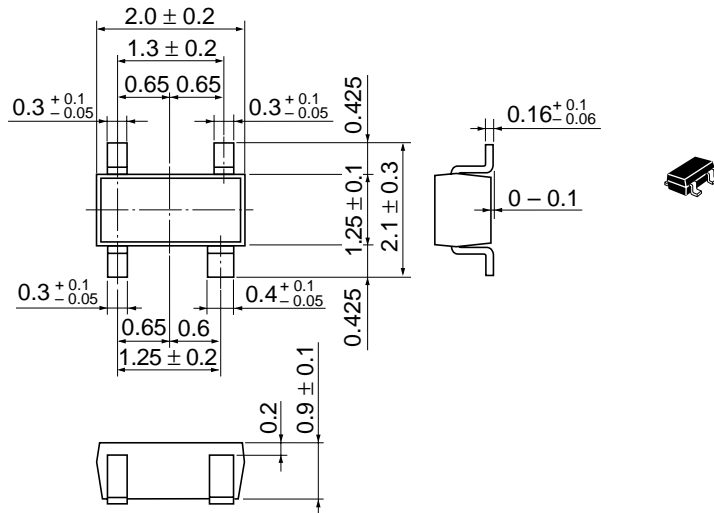
Sparameter ($V_{CE} = 2 \text{ V}$, $I_C = 10 \text{ mA}$, $Z_o = 50 \Omega$)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.779	-6.9	21.32	173.3	0.0028	95.3	0.971	-3.6
200	0.773	-14.5	20.95	166.2	0.0064	92.6	0.971	-7.5
300	0.763	-22.9	20.35	158.9	0.0102	91.8	0.961	-12.1
400	0.741	-31.4	19.65	151.7	0.0142	87.0	0.941	-16.7
500	0.714	-38.7	18.72	145.2	0.0183	83.4	0.911	-20.8
600	0.679	-46.2	17.65	139.3	0.0222	79.7	0.876	-24.7
700	0.641	-53.6	16.61	133.9	0.0255	75.6	0.836	-27.9
800	0.601	-59.7	15.54	129.3	0.0286	72.7	0.795	-30.8
900	0.563	-65.6	14.54	124.4	0.0313	69.5	0.756	-33.1
1000	0.523	-70.7	13.62	120.5	0.0335	67.8	0.720	-34.9
1100	0.488	-75.0	12.78	117.1	0.0356	66.0	0.687	-36.5
1200	0.458	-80.1	12.05	114.1	0.0376	64.1	0.657	-37.5
1300	0.427	-83.8	11.36	111.0	0.0393	62.8	0.628	-38.4
1400	0.400	-88.9	10.64	108.5	0.0410	62.4	0.607	-38.9
1500	0.374	-91.9	10.15	106.0	0.0426	61.0	0.582	-39.6
1600	0.350	-96.1	9.59	104.0	0.0441	61.1	0.567	-39.8
1700	0.326	-100.1	9.14	101.7	0.0455	60.4	0.548	-40.2
1800	0.304	-102.9	8.68	100.1	0.0469	59.7	0.533	-40.2
1900	0.282	-107.0	8.29	98.1	0.0486	59.1	0.521	-40.5
2000	0.267	-110.8	7.93	96.1	0.0500	59.2	0.508	-40.5
2100	0.253	-115.2	7.62	94.4	0.0517	59.3	0.498	-40.5
2200	0.234	-118.7	7.30	92.6	0.0527	59.2	0.489	-40.7
2300	0.225	-122.1	7.03	91.0	0.0543	58.6	0.481	-40.6
2400	0.212	-127.9	6.76	89.6	0.0557	58.4	0.473	-40.7
2500	0.199	-131.8	6.54	88.8	0.0573	58.2	0.468	-40.5
2600	0.193	-135.2	6.31	86.8	0.0579	58.3	0.461	-40.7
2700	0.186	-141.9	6.11	85.4	0.0600	58.2	0.456	-40.4
2800	0.178	-146.0	5.89	84.2	0.0612	58.2	0.450	-40.6
2900	0.177	-151.4	5.73	82.7	0.0624	58.3	0.447	-40.5
3000	0.168	-157.0	5.56	81.4	0.0642	57.8	0.442	-40.9

Package Dimensions

As of January, 2001

Unit: mm



Hitachi Code	CMPAK-4(T)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.006 g

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