2SC5623

Silicon NPN Epitaxial
High Frequency Low Noise Amplifier

HITACHI

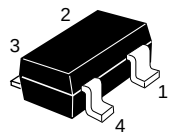
ADE-208-977 (Z)
1st. Edition
Nov. 2000

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-”.

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

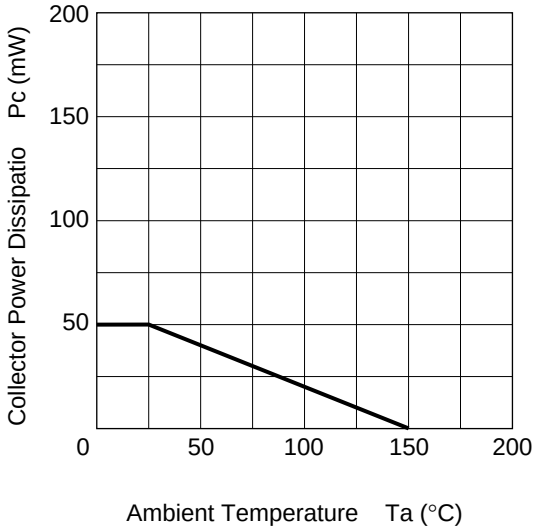
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	10	V
Collector to emitter voltage	V_{CEO}	3.5	V
Emitter to base voltage	V_{EBO}	1	V
Collector current	I_C	12	mA
Collector power dissipation	Pc	50	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

Electrical Characteristics (Ta = 25°C)

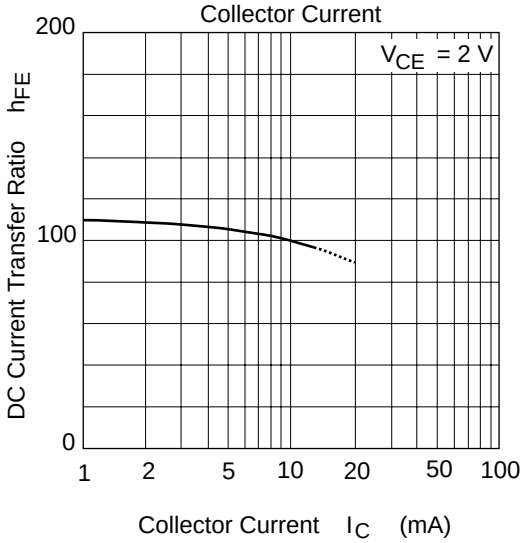
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	10	—	—	V	I_C = 10 µA , I_E = 0
Collector cutoff current	I_{CBO}	—	—	1	µA	V_{CB} = 8 V , I_E = 0
Collector cutoff current	I_{CEO}	—	—	1	µA	V_{CE} = 3 V , R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB}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

Main Characteristics

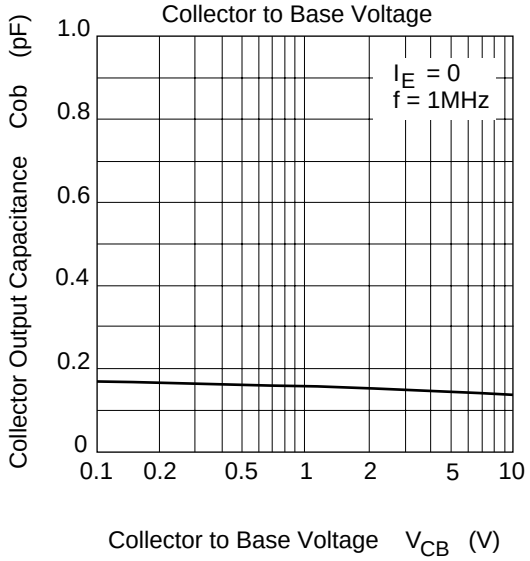
Collector Power Dissipation Curve



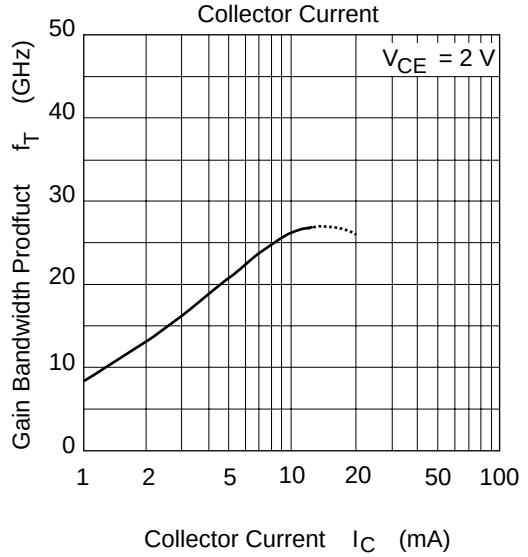
DC Current Transfet Ratio vs. Collector Current



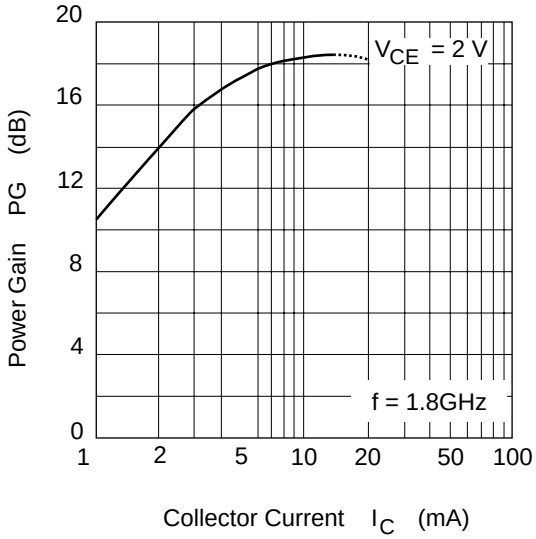
Collector Output Capacitance vs. Collector to Base Voltage



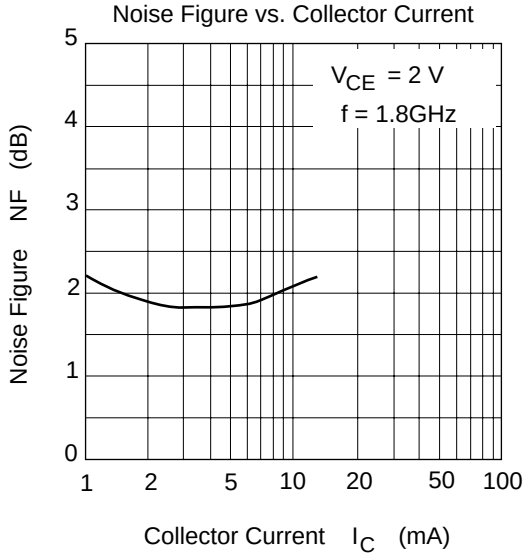
Gain Bandwidth Product vs. Collector Current



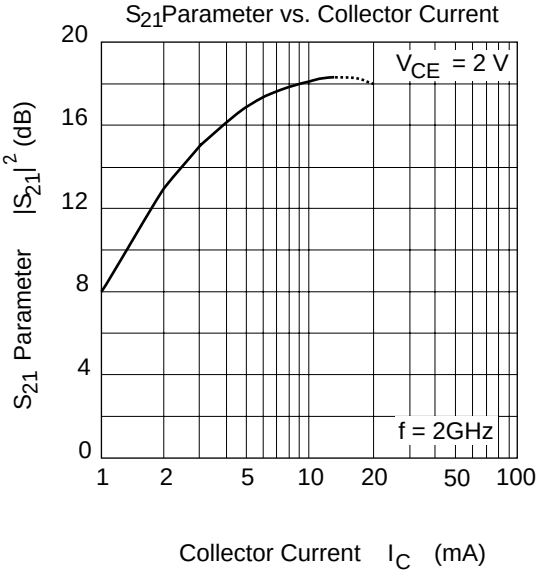
Power Gain vs. Collector Current



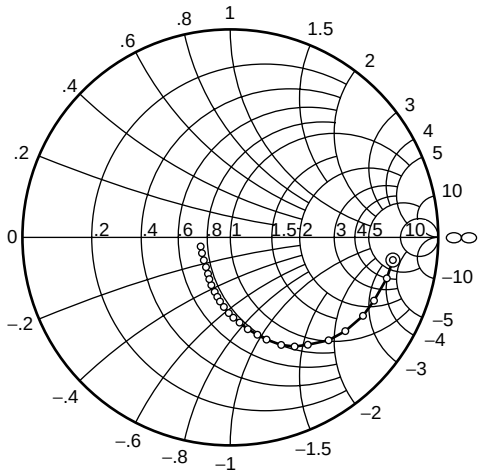
Noise Figure vs. Collector Current



S_{21}Parameter vs. Collector Current



S11 Parameter vs. Frequency

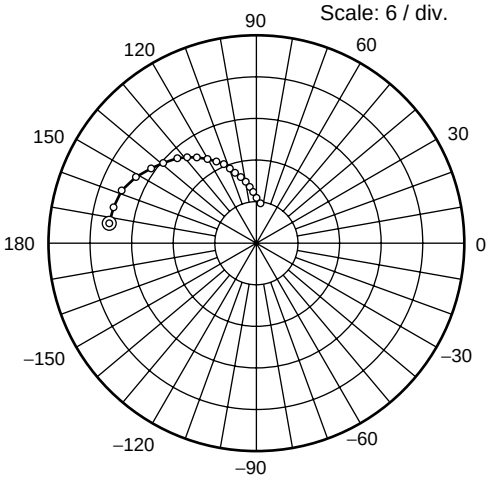


Condition : V_{CE} = 2 V , I_C = 10 mA

100 to 3000 MHz (100 MHz step)

S21 Paramter vs. Frequency

Scale: 6 / div.

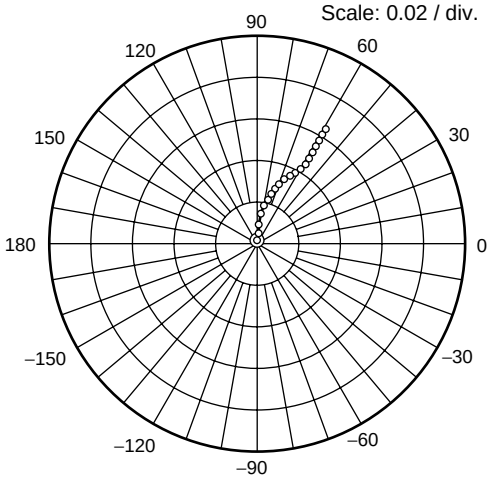


Condition : V_{CE} = 2 V , I_C = 10 mA

100 to 3000 MHz (100 MHz step)

S12 Parameter vs. Frequency

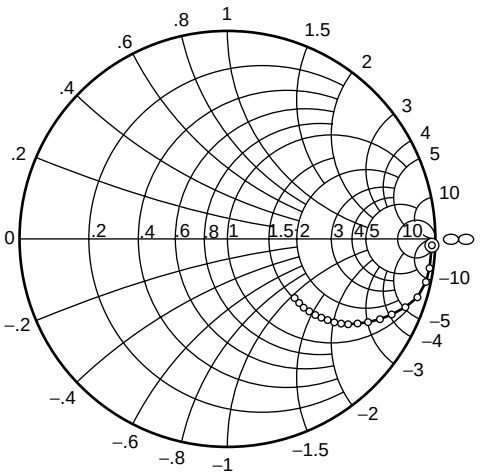
Scale: 0.02 / div.



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

100 to 3000 MHz (100 MHz step)

S22 Parameter vs. Frequency



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

100 to 3000 MHz (100 MHz step)

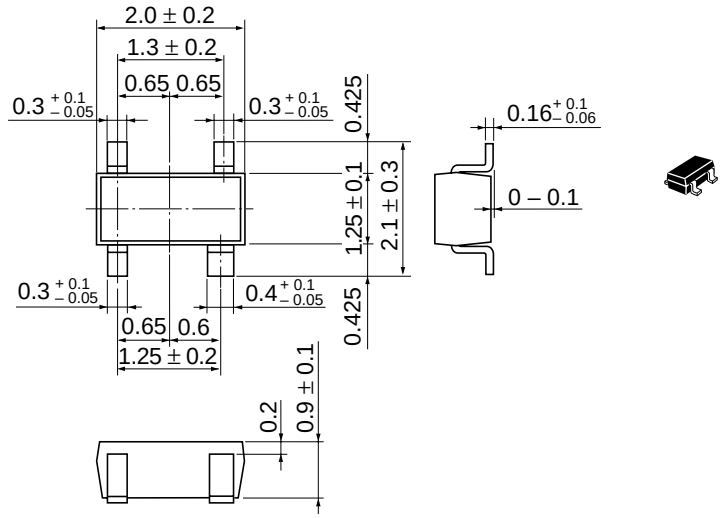
Sparameter (V_{CE} = 2 V, I_C = 10 mA, Zo = 50 Ω)

	S11		S21		S12		S22	
f (MHz)	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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