2SC5218

Silicon NPN Epitaxial

HITACHI

ADE-208-279A (Z)
2nd. Edition
Mar. 2001

Application

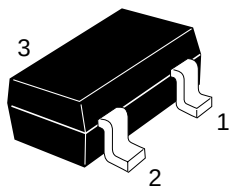
VHF / UHF wide band amplifier

Features

- High gain bandwidth product
  f_T = 9 GHz typ
- High gain, low noise figure
  PG = 13.0 dB typ, NF = 1.2 dB typ at f = 900 MHz

Outline

MPAK



1. Emitter
2. Base
3. Collector

Note: Marking is “YK–”.

Attention: This device is very sensitive to electro static discharge.
It is recommended to adopt appropriate cautions when handling this transistor.

Hitachi semiconductor

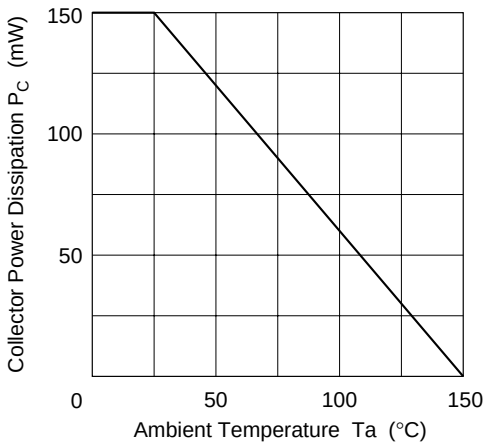
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	9	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	150	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

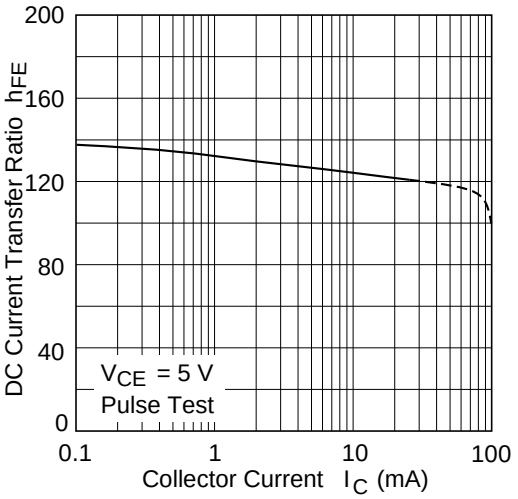
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	1	µA	V_{CB} = 12 V, I_E = 0
	I_{CEO}	—	—	1	mA	V_{CE} = 9 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 1.5 V, I_C = 0
DC current transfer ratio	h_{FE}	50	120	250		V_{CE} = 5 V, I_C = 20 mA
Collector output capacitance	Cob	—	0.8	1.4	pF	V_{CB} = 5 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	6.0	9.0	—	GHz	V_{CE} = 5 V, I_C = 20 mA
Power gain	PG	10	13	—	dB	V_{CE} = 5 V, I_C = 20 mA, f = 900 MHz
Noise figure	NF	—	1.2	2.5	dB	V_{CE} = 5 V, I_C = 5 mA, f = 900 MHz

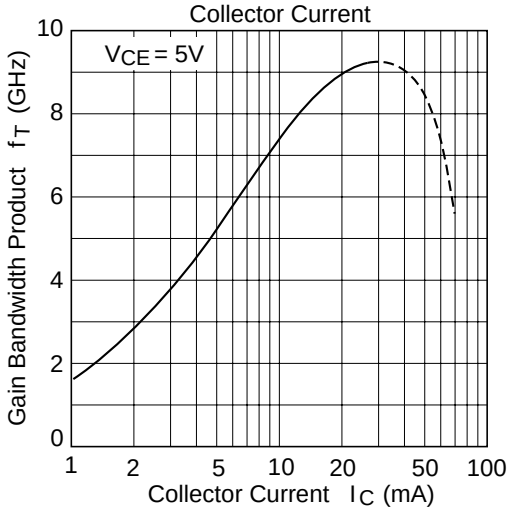
Maximum Collector Dissipation Curve



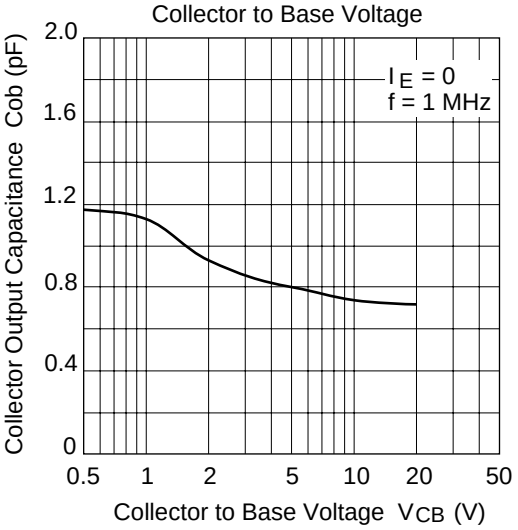
DC Current Transfer Ratio vs. Collector Current



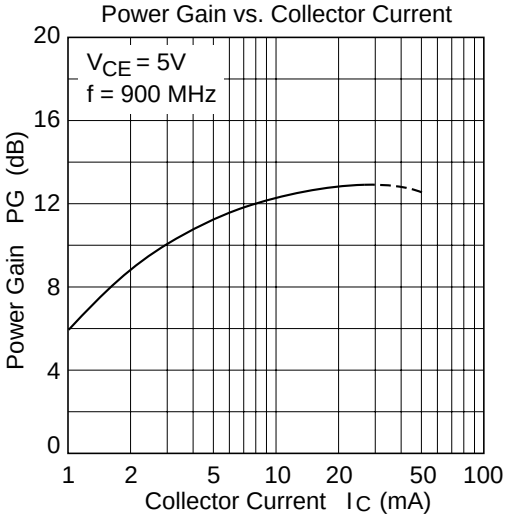
Gain Bandwidth Product vs. Collector Current



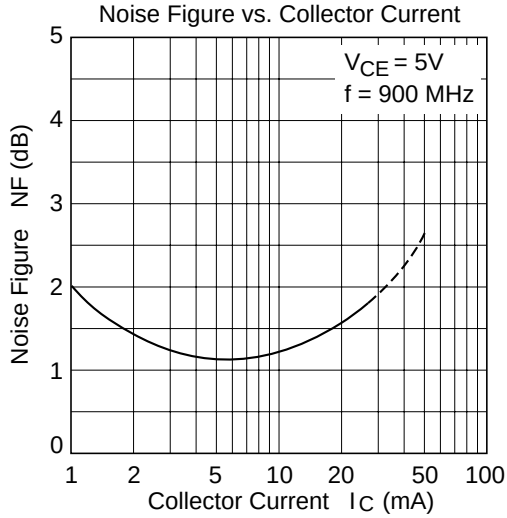
Collector Output Capacitance vs. Collector to Base Voltage



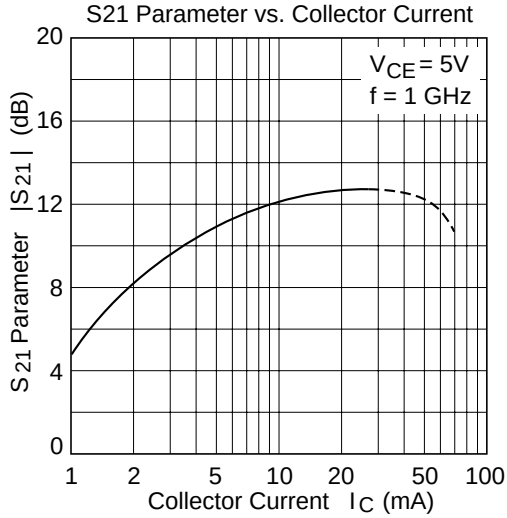
Power Gain vs. Collector Current



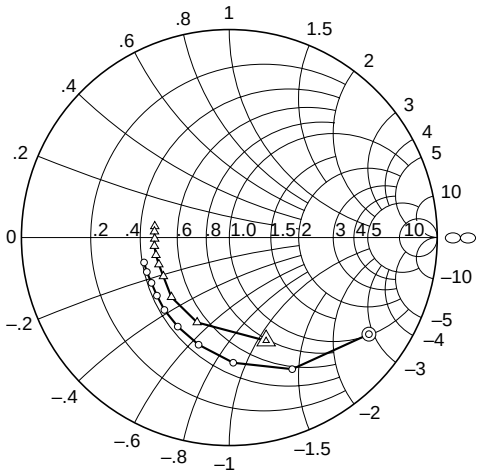
Noise Figure vs. Collector Current



S21 Parameter vs. Collector Current

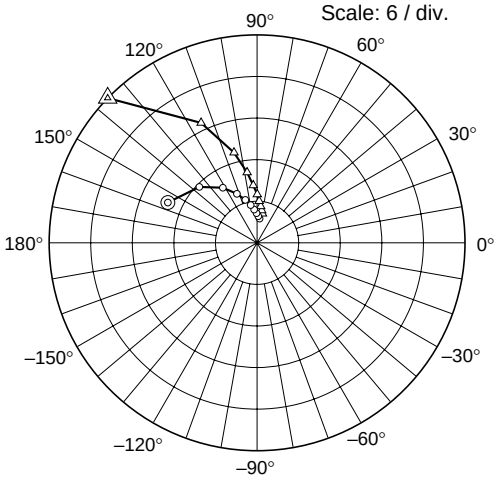


S11 Parameter vs. Frequency



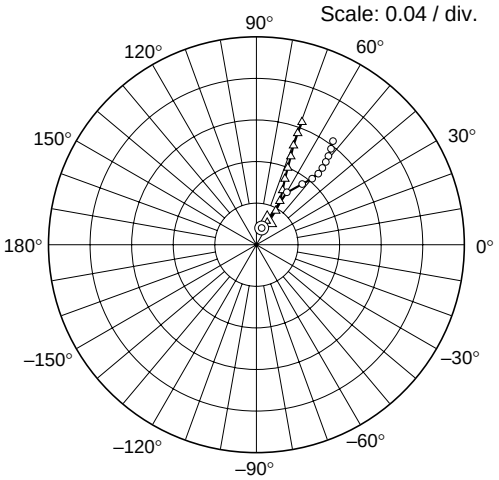
Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S21 Parameter vs. Frequency



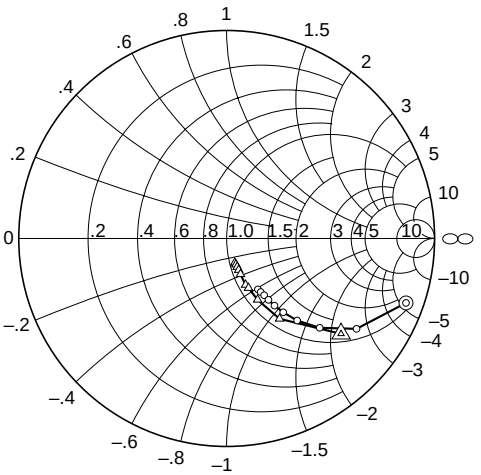
Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S12 Parameter vs. Frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S22 Parameter vs. Frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S Parameter (V_{CE} = 5 V, I_C = 5 mA, Z_O = 50 Ω)

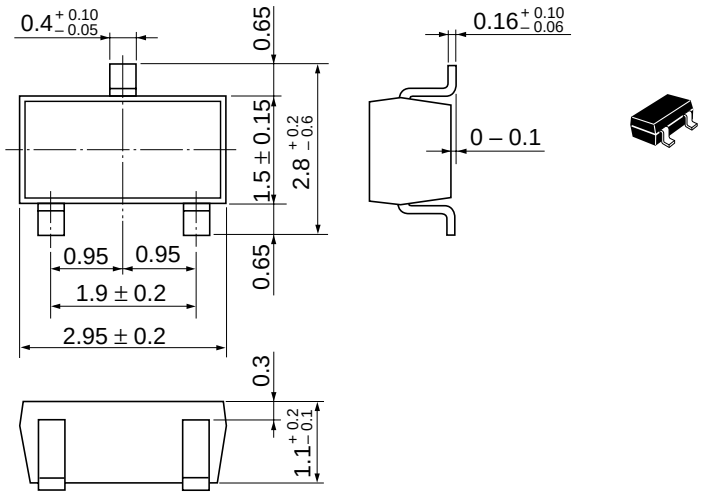
Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
100	0.817	–34.7	14.1	156	0.034	72.3	0.916	–19.8
200	0.701	–64.5	11.6	136	0.058	59.8	0.761	–34.8
300	0.602	–88.3	9.32	122	0.073	52.9	0.620	–43.9
400	0.536	–106	7.61	112	0.083	49.8	0.520	–49.3
500	0.495	–120	6.40	105	0.091	48.9	0.447	–52.5
600	0.468	–132	5.50	99.5	0.097	49.3	0.396	–54.5
700	0.447	–141	4.80	94.9	0.104	50.0	0.357	–55.7
800	0.434	–150	4.27	90.9	0.110	50.9	0.327	–56.5
900	0.423	–157	3.83	87.2	0.117	52.1	0.305	–57.5
1000	0.428	–164	3.50	83.9	0.124	53.3	0.287	–58.4

S Parameter (V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
100	0.529	–70.4	29.9	136	0.025	64.9	0.716	–39.8
200	0.427	–111	19.0	115	0.038	60.3	0.462	–56.6
300	0.386	–134	13.4	104	0.048	61.8	0.330	–63.2
400	0.370	–150	10.2	98.0	0.058	64.3	0.260	–66.2
500	0.366	–159	8.28	93.7	0.069	66.6	0.214	–67.8
600	0.367	–167	6.96	89.7	0.080	67.8	0.184	–68.8
700	0.364	–174	6.01	87.0	0.091	68.7	0.162	–69.1
800	0.360	–179	5.28	84.2	0.102	69.5	0.146	–69.7
900	0.362	176	4.71	81.7	0.115	69.4	0.133	–70.4
1000	0.364	171	4.27	79.3	0.126	69.6	0.123	–71.5

Package Dimensions

As of January, 2001
Unit: mm



Hitachi Code	MPAK
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.011 g

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