2SC5138

Silicon NPN Epitaxial

HITACHI

ADE-208-225
1st. Edition

Application

VHF / UHF wide band amplifier

Features

- High gain bandwidth product
  f_T = 6 GHz typ
- High gain, low noise figure
  PG = 13 dB typ, NF = 1.8 dB typ at f = 900 MHz

Outline

SMPAK

1. Emitter
2. Base
3. Collector

2SC5138

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	20	V
Collector to emitter voltage	V_{CEO}	12	V
Emitter to base voltage	V_{EBO}	2	V
Collector current	I_C	30	mA
Collector power dissipation	P_C	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

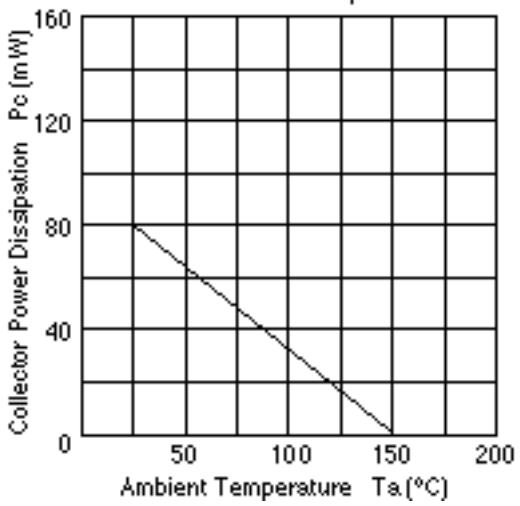
Note: Marking is “YL–”.

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

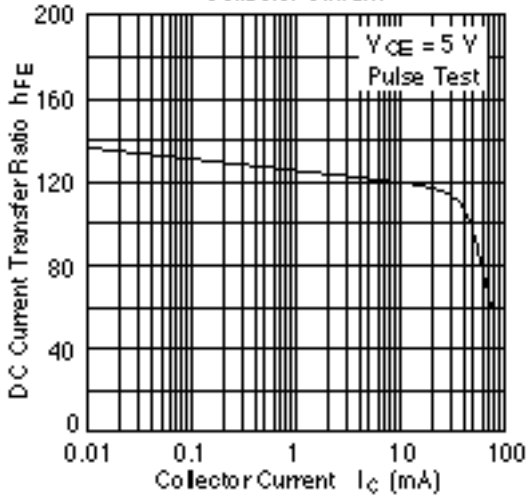
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector cutoff current	I_{CBO}	—	—	10	µA	V_{CB} = 20 V, I_E = 0
	I_{CEO}	—	—	1	mA	V_{CE} = 12 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 2 V, I_C = 0
DC current transfer ratio	h_{FE}	50	120	250		V_{CE} = 5 V, I_C = 10 mA
Collector output capacitance	Cob	—	0.65	1.05	pF	V_{CB} = 5 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	4	6	—	GHz	V_{CE} = 5 V, I_C = 10 mA
Power gain	PG	9.5	13	—	dB	V_{CE} = 5 V, I_C = 10 mA, f = 900 MHz
Noise figure	NF	—	1.8	3.0	dB	V_{CE} = 5 V, I_C = 5 mA, f = 900 MHz

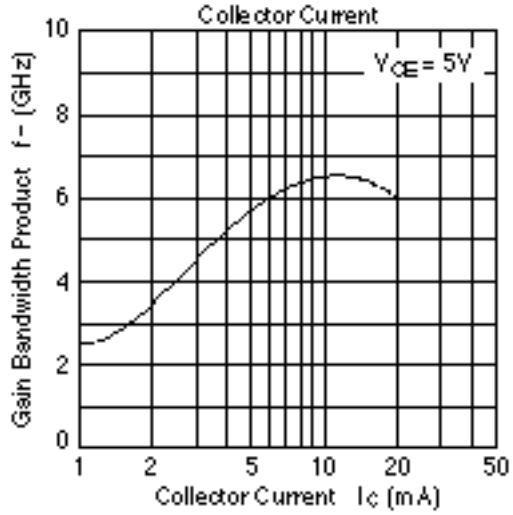
Maximum Collector Dissipation Curve



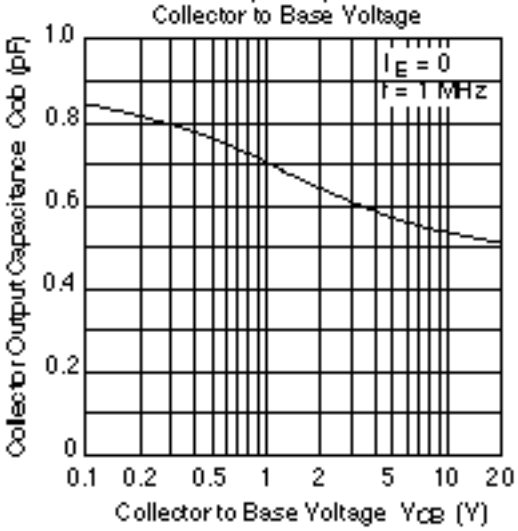
DC Current Transfer Ratio vs. Collector Current



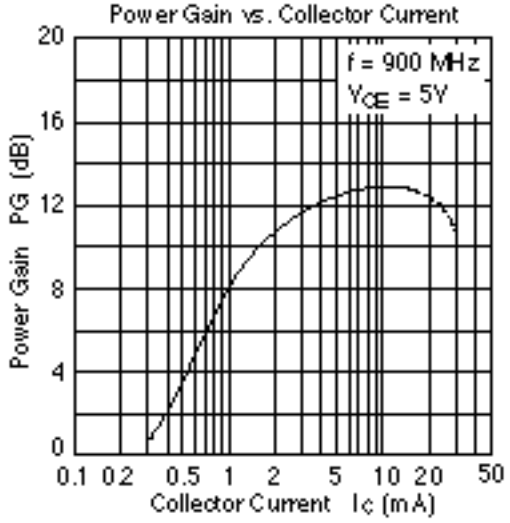
Gain Bandwidth Product vs. Collector Current



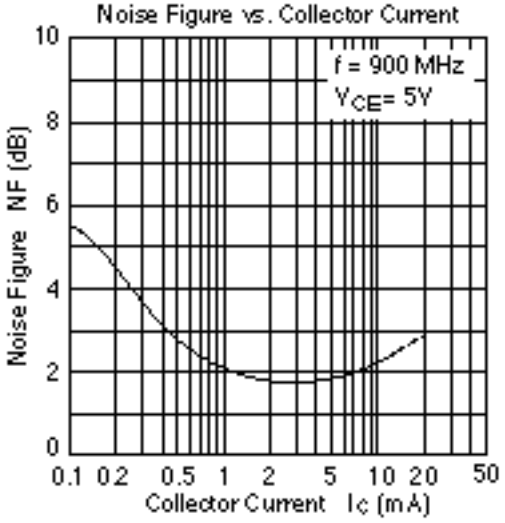
Collector Output Capacitance vs. Collector to Base Voltage



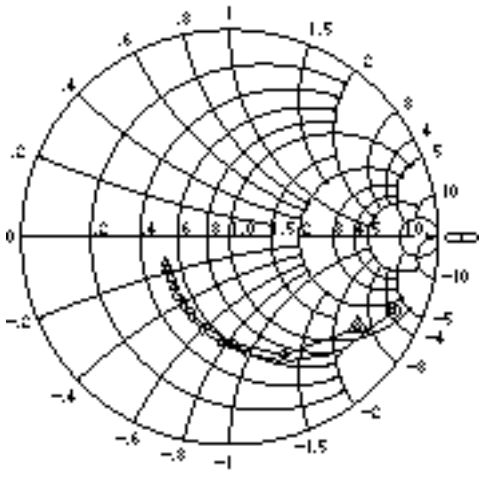
Power Gain vs. Collector Current



Noise Figure vs. Collector Current



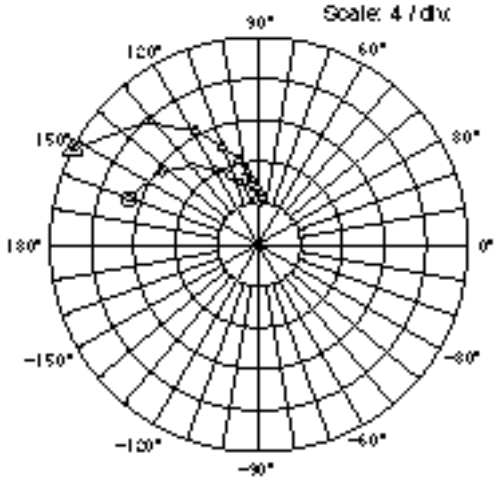
S11 Parameter vs. Frequency



Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(Ic = 5 mA)
(Ic = 10 mA)

S21 Parameter vs. Frequency

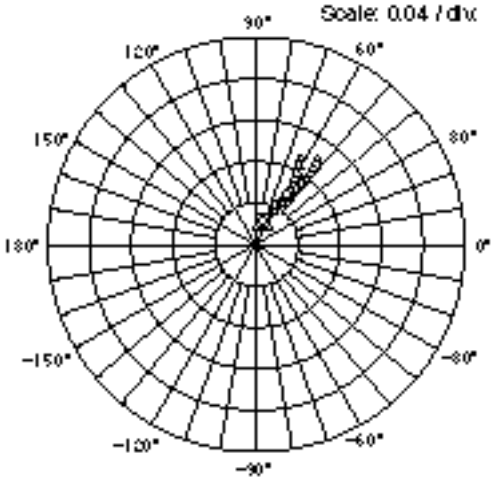
Scale: 4 / div.



Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(Ic = 5 mA)
(Ic = 10 mA)

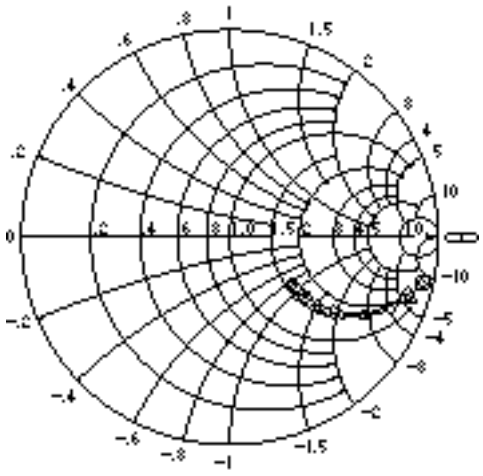
S12 Parameter vs. Frequency

Scale: 0.04 / div.



Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(Ic = 5 mA)
(Ic = 10 mA)

S22 Parameter vs. Frequency



Condition: V_{CE} = 5 V, Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(Ic = 5 mA)
(Ic = 10 mA)

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