

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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2SC5078

Silicon NPN Epitaxial

RENESAS

ADE-208-221
1st. Edition

Application

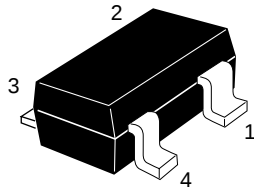
VHF / UHF wide band amplifier

Features

- High gain bandwidth product
 $f_T = 12 \text{ GHz Typ}$
- High gain, low noise figure
 $PG = 17 \text{ dB Typ}$, $NF = 1.6 \text{ dB Typ}$ at $f = 900 \text{ MHz}$

Outline

MPAK-4



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

Absolute Maximum Ratings (Ta = 25°C)

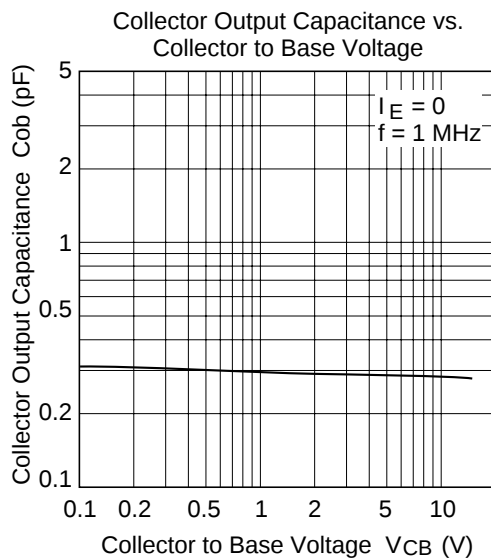
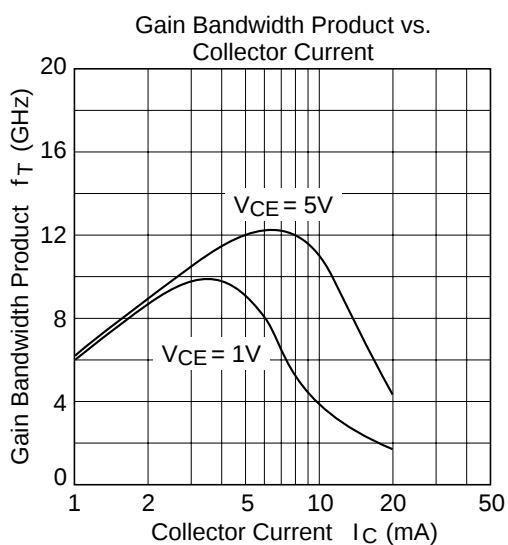
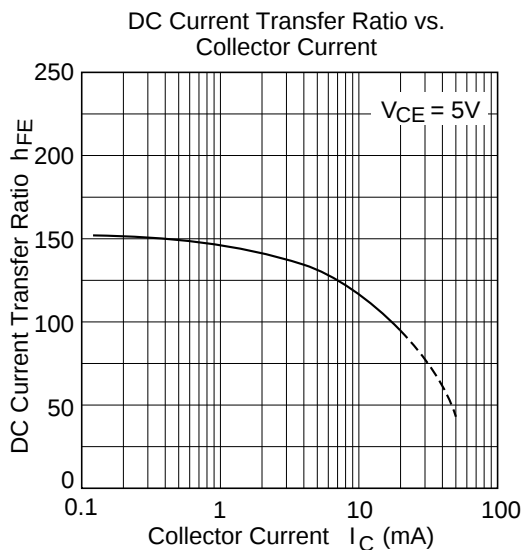
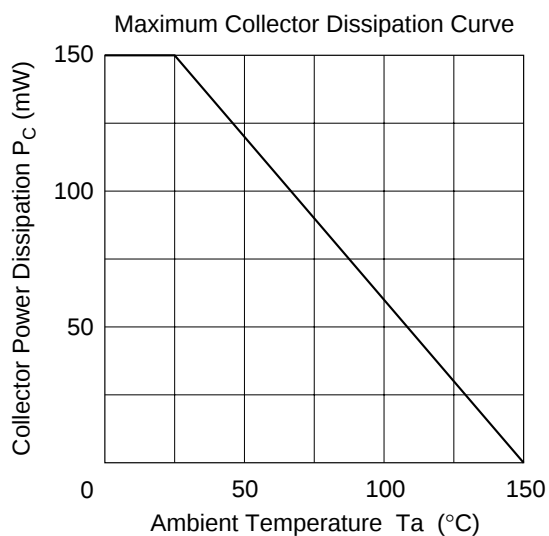
Item	Symbol	Ratings	Unit
Collector to base voltage	V _{CBO}	15	V
Collector to emitter voltage	V _{CEO}	8	V
Emitter to base voltage	V _{EBO}	1.5	V
Collector current	I _C	20	mA
Collector power dissipation	P _C	150	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	−55 to +150	°C

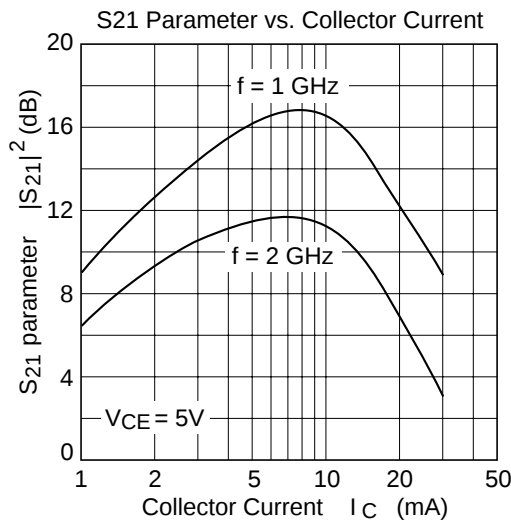
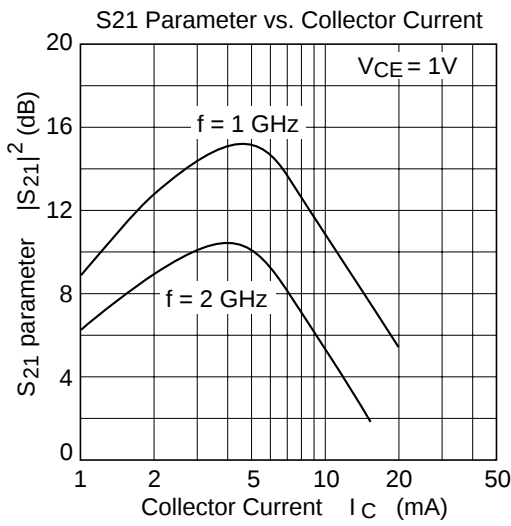
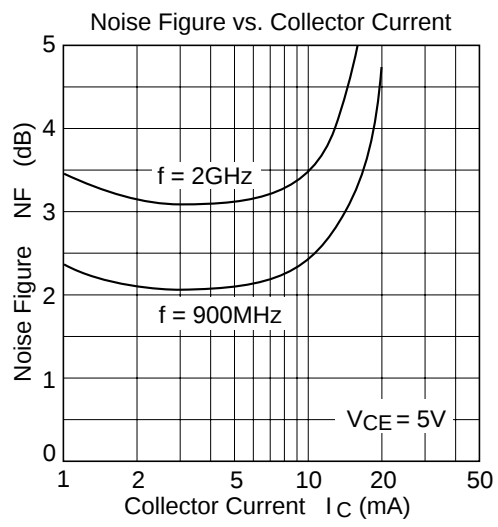
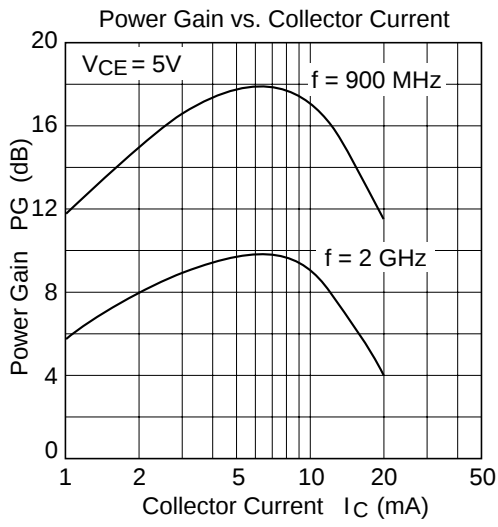
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector cutoff current	I _{CBO}	—	—	10	μA	V _{CB} = 15 V, I _E = 0
	I _{CEO}	—	—	1	mA	V _{CE} = 8 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	160		V _{CE} = 5 V, I _C = 10 mA
Collector output capacitance	Cob	—	0.3	0.8	pF	V _{CB} = 5 V, I _E = 0, f = 1 MHz
Gain bandwidth product	f _T	9	12	—	GHz	V _{CE} = 5 V, I _C = 5 mA
Power gain	PG	14	17	20	dB	V _{CE} = 5 V, I _C = 10 mA, f = 900 MHz
Noise figure	NF	—	1.6	2.5	dB	V _{CE} = 5 V, I _C = 5 mA, f = 900 MHz

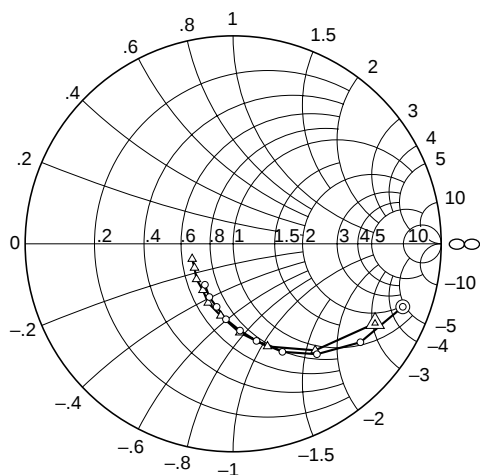
Note: Marking is “ZC—”.

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





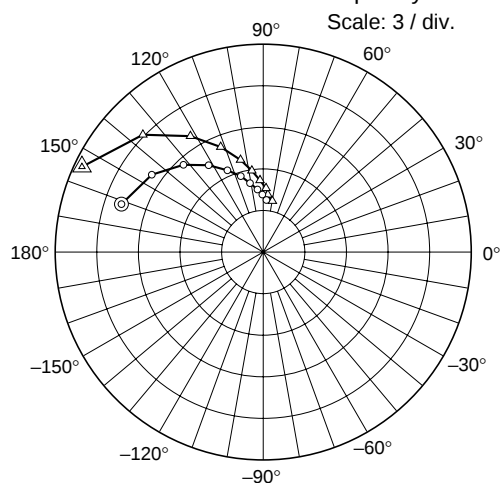
S11 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)

○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 10\text{ mA}$)

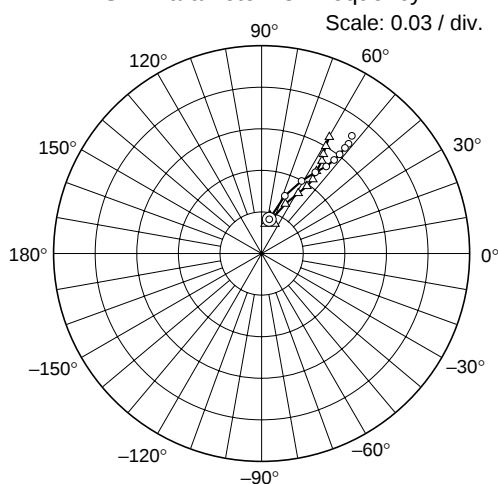
S21 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)

○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 10\text{ mA}$)

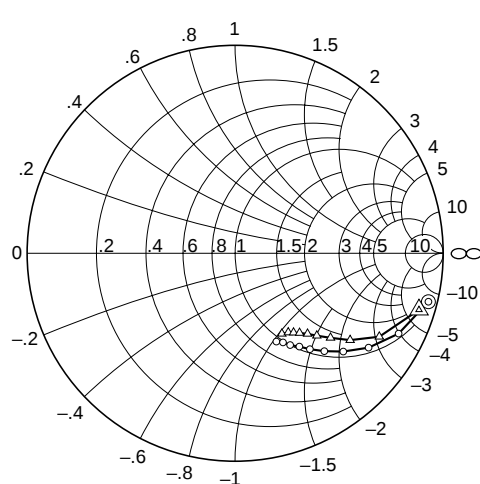
S12 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)

○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 10\text{ mA}$)

S22 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)

○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 10\text{ mA}$)

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