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# 2SC5078

Silicon NPN Epitaxial

# HITACHI

ADE-208-221

1st. Edition

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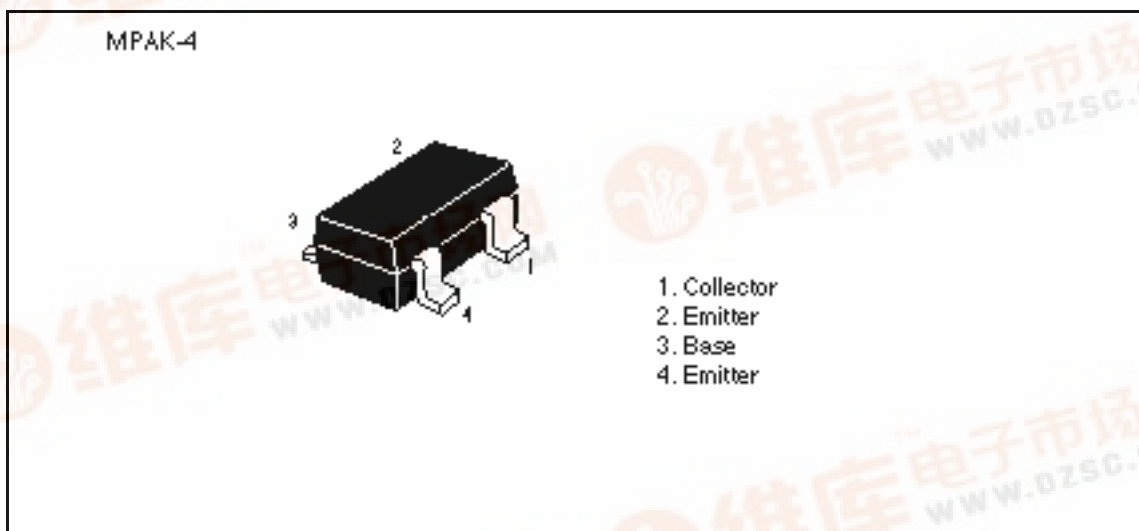
## Application

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



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### 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

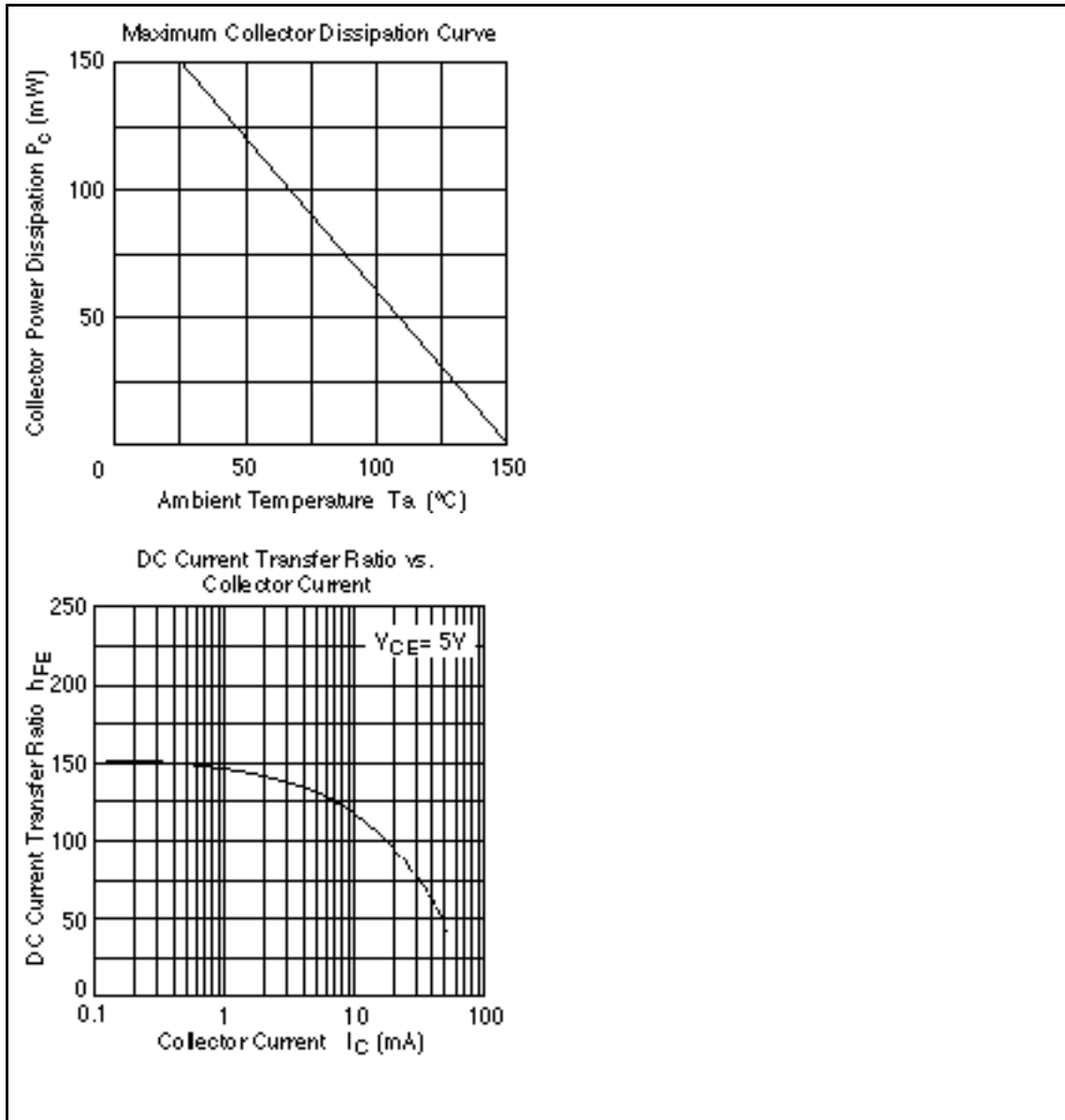
### Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector cutoff current	$I_{CBO}$	—	—	10	μA	$V_{CB} = 15\text{ V}, I_E = 0$
	$I_{CEO}$	—	—	1	mA	$V_{CE} = 8\text{ V}, R_{BE} =$
Emitter cutoff current	$I_{EBO}$	—	—	10	μA	$V_{EB} = 1.5\text{ V}, I_C = 0$
DC current transfer ratio	$h_{FE}$	50	120	160		$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$
Collector output capacitance	$C_{ob}$	—	0.3	0.8	pF	$V_{CB} = 5\text{ V}, I_E = 0, f = 1\text{ MHz}$
Gain bandwidth product	$f_T$	9	12	—	GHz	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}$
Power gain	PG	14	17	20	dB	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA},$ $f = 900\text{ MHz}$
Noise figure	NF	—	1.6	2.5	dB	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA},$ $f = 900\text{ MHz}$

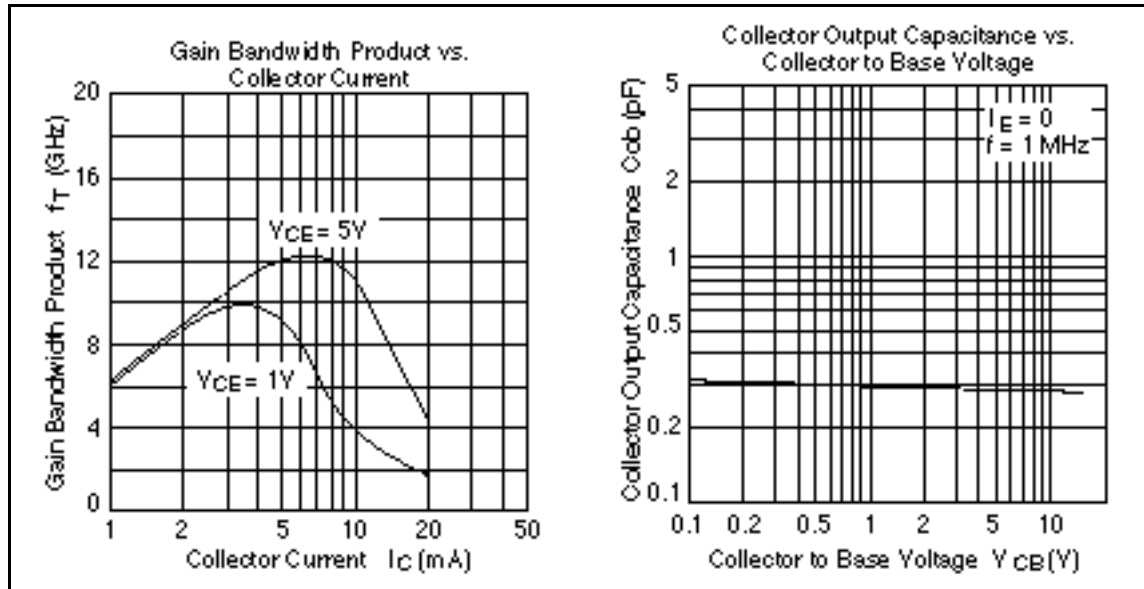
Note: Marking is "ZC-".

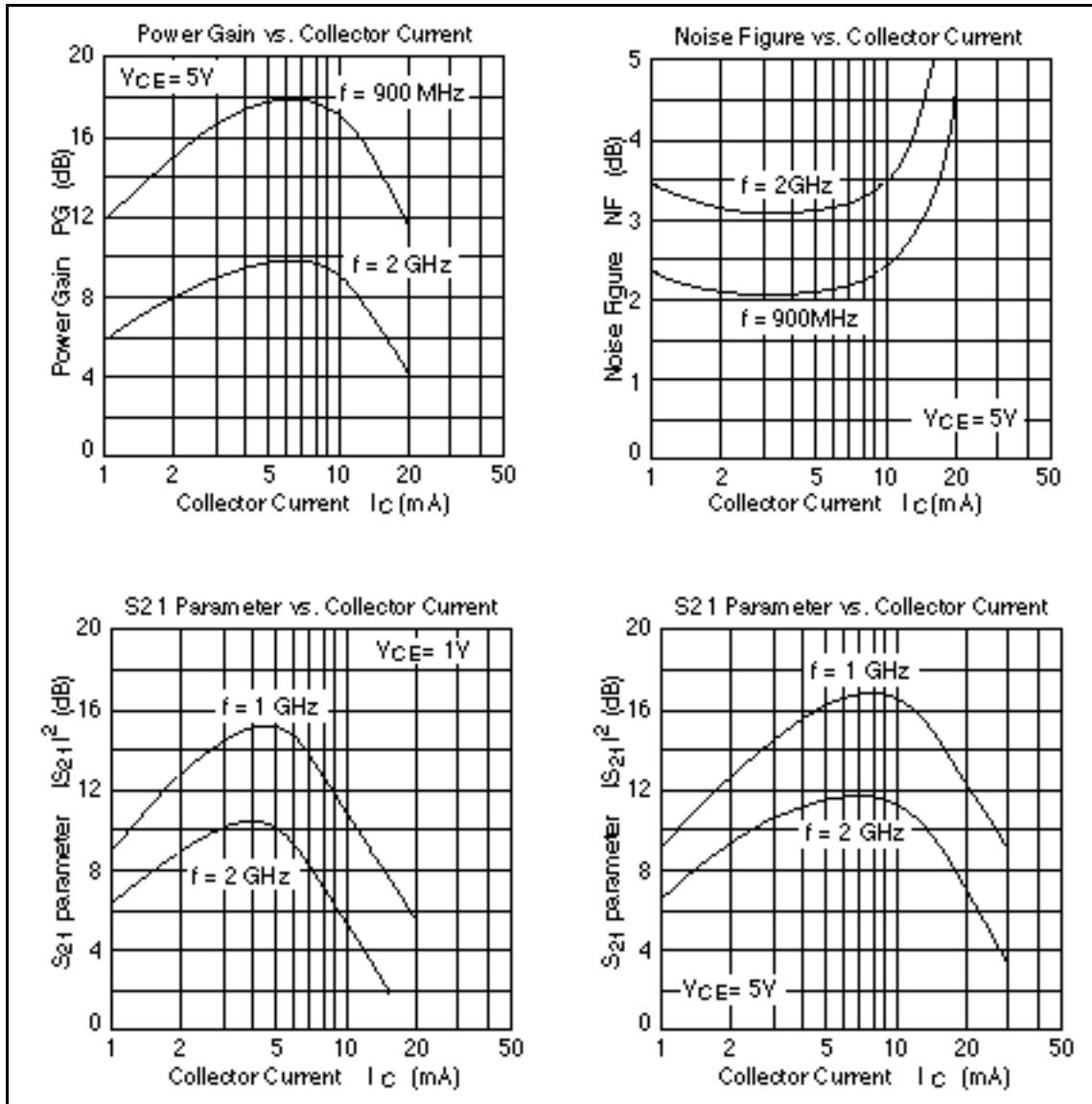
Attention: This device is very sensitive to electro static discharge.

It is recommended to adopt appropriate cautions when handling this transistor.

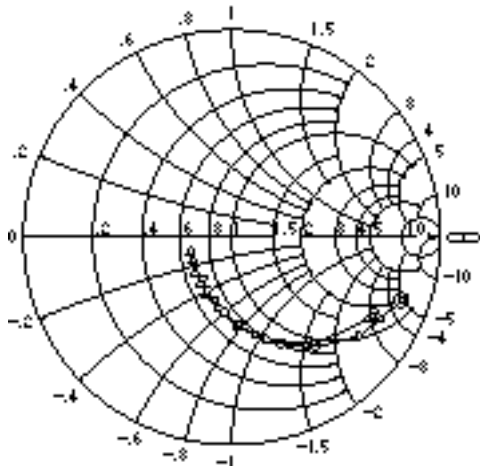


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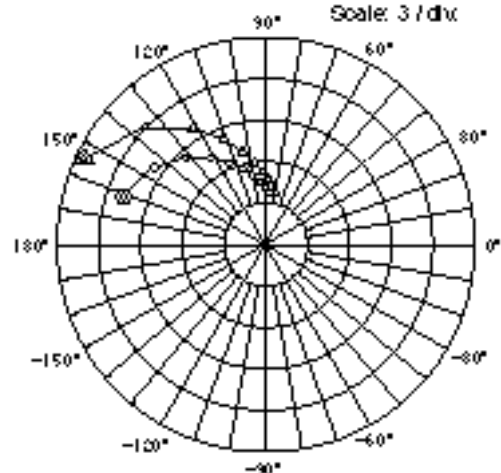


S11 Parameter vs. Frequency



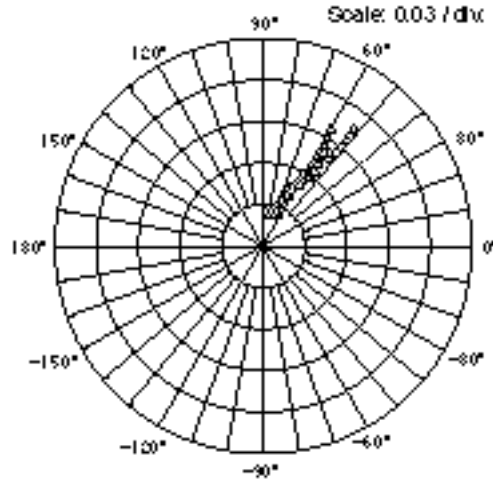
Condition:  $V_{CE} = 5\text{ V}$ ,  $Z_0 = 50\ \Omega$   
 200 to 2000 MHz (200 MHz step)  
 ○ — ◇ (Ic = 5 mA)  
 △ — △ (Ic = 10 mA)

S21 Parameter vs. Frequency



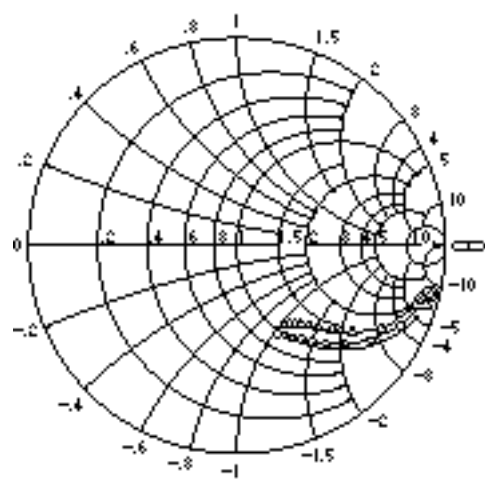
Condition:  $V_{CE} = 5\text{ V}$ ,  $Z_0 = 50\ \Omega$   
 200 to 2000 MHz (200 MHz step)  
 ○ — ◇ (Ic = 5 mA)  
 △ — △ (Ic = 10 mA)

S12 Parameter vs. Frequency



Condition:  $V_{CE} = 5\text{ V}$ ,  $Z_0 = 50\ \Omega$   
 200 to 2000 MHz (200 MHz step)  
 ○ — ◇ (Ic = 5 mA)  
 △ — △ (Ic = 10 mA)

S22 Parameter vs. Frequency



Condition:  $V_{CE} = 5\text{ V}$ ,  $Z_0 = 50\ \Omega$   
 200 to 2000 MHz (200 MHz step)  
 ○ — ◇ (Ic = 5 mA)  
 △ — △ (Ic = 10 mA)

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