



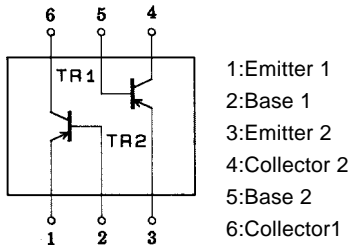
# FC151

## PNP Epitaxial Planar Silicon Composite Transistor High-Frequency Amp, Current Mirror Circuit Applications

### Features

- Composite type with 2 transistors contained in the CP package currently in use, improving the mounting efficiency greatly.
- The FC151 is formed with two chips, being equivalent to the 2SA1669, placed in one package.
- Excellent in thermal equilibrium and pair capability.

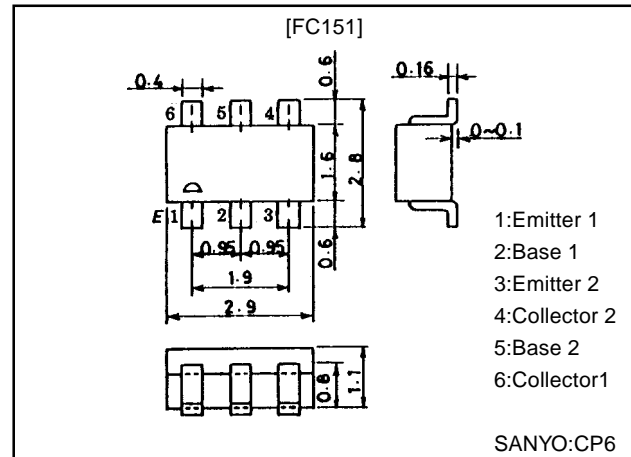
### Electrical Connection



### Package Dimensions

unit:mm

2103A



### Specifications

#### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		-20	V
Collector-to-Emitter Voltage	$V_{CEO}$		-15	V
Emitter-to-Base Voltage	$V_{EBO}$		-3	V
Collector Current	$I_C$		-50	mA
Collector Dissipation	$P_C$	1 unit	200	mW
Total Dissipation	$P_T$		300	mW
Junction Temperature	$T_J$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

#### Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-15\text{V}, I_E=0$			-0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-2\text{V}, I_E=0$			-0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=-10\text{V}, I_C=-5\text{mA}$	20		100	
DC Current Gain Ratio	$h_{FE}(\text{small/large})$	$V_{CE}=-10\text{V}, I_C=-5\text{mA}$	0.7	0.93		
B-E Voltage Difference	$V_{BE}(\text{large-small})$	$V_{CE}=-10\text{V}, I_C=-5\text{mA}$		3.0	15	mV
Gain-Bandwidth Product	$f_T$	$V_{CE}=-10\text{V}, I_C=-5\text{mA}$	1.5	3.0		GHz
Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$		1.0	1.5	pF
Forward Transfer Gain	$ S_{21e} $	$V_{CE}=-10\text{V}, I_C=-5\text{mA}, f=0.9\text{GHz}$	5			dB
Noise Figure	NF	$V_{CE}=-10\text{V}, I_C=-3\text{mA}, f=0.9\text{GHz}$		2.0		dB

Note:The specifications shown above are for each individual transistor. However, the specifications of  $h_{FE}(\text{small/large})$  and  $h_{FE}(\text{large-small})$  are for pair capability

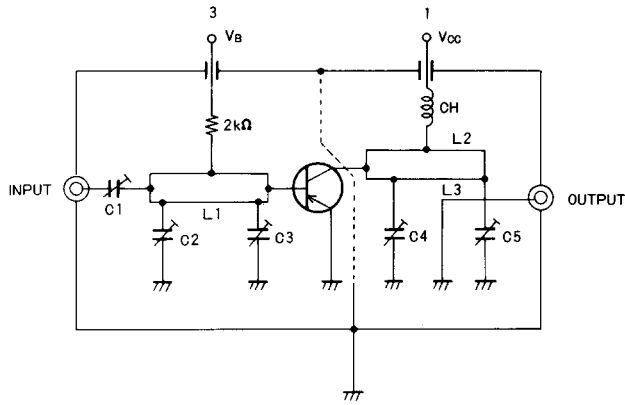
Marking:151

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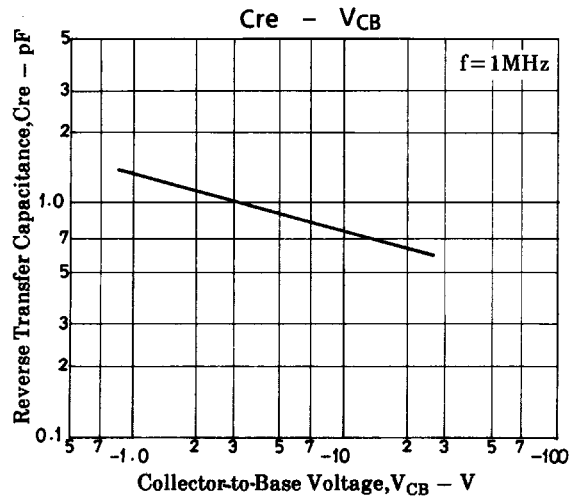
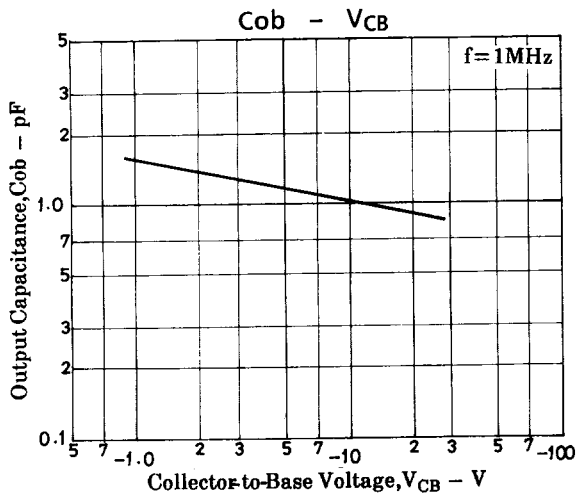
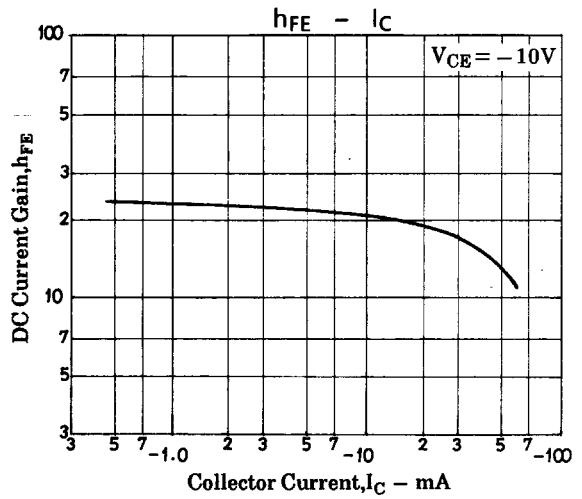
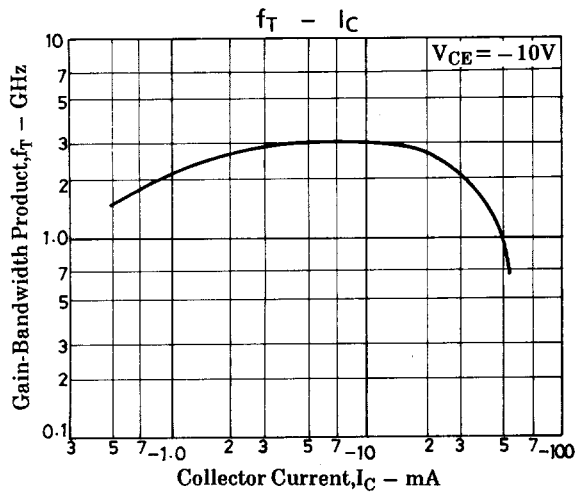
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# FC151

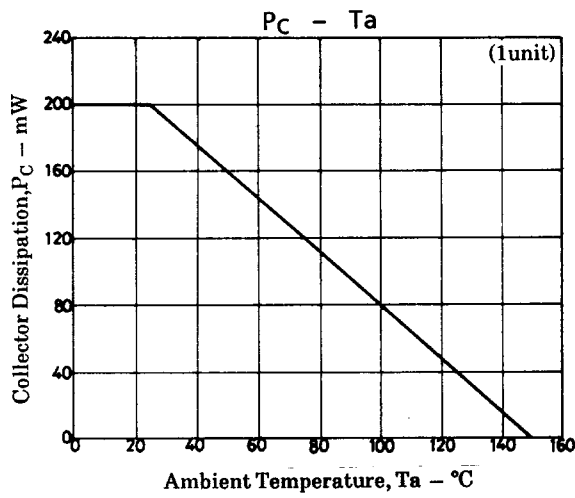
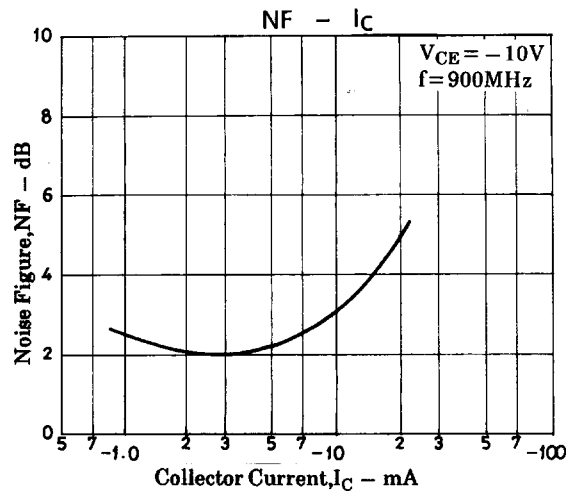
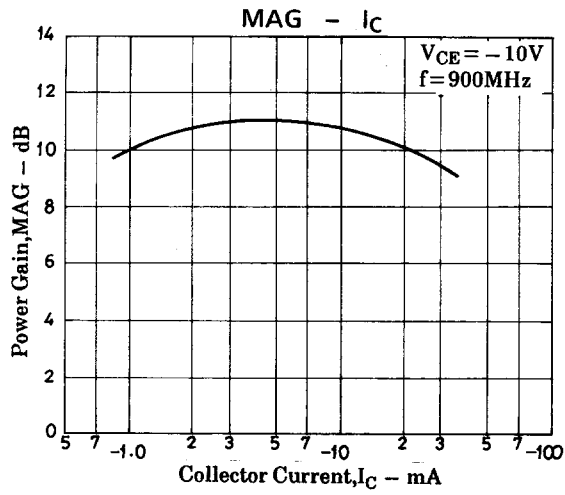
## NF Test Circuit



900MHz	
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~10pF
L1	W≅1.5mm, l≅25mm strip line
L2	W≅4mm, l≅25mm strip line
L3	0.5ϕ, l≅40mm
CH	2t + bead core



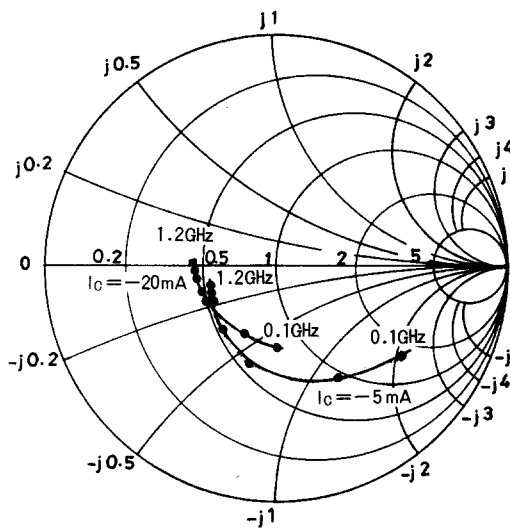
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## S Parameter

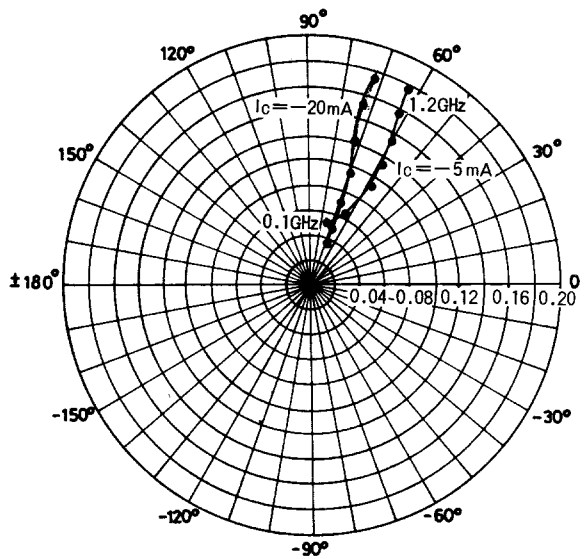
S11e:  $V_{CE} = -10V$

$f = 100MHz, 200$  to  $1200MHz$  (200MHz step)



S12e:  $V_{CE} = -10V$

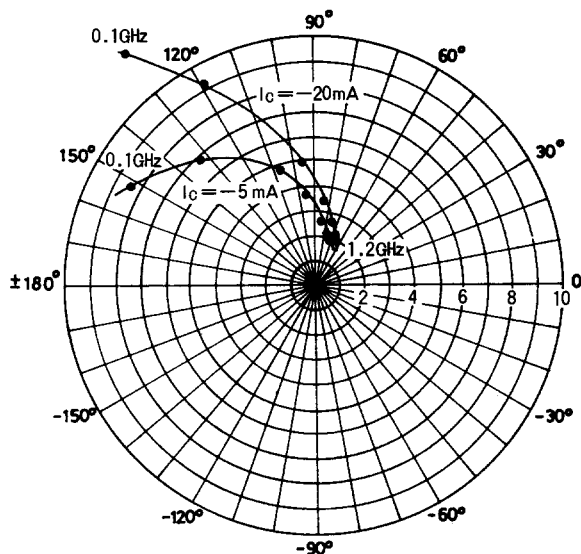
$f = 100MHz, 200$  to  $1200MHz$  (200MHz step)



# FC151

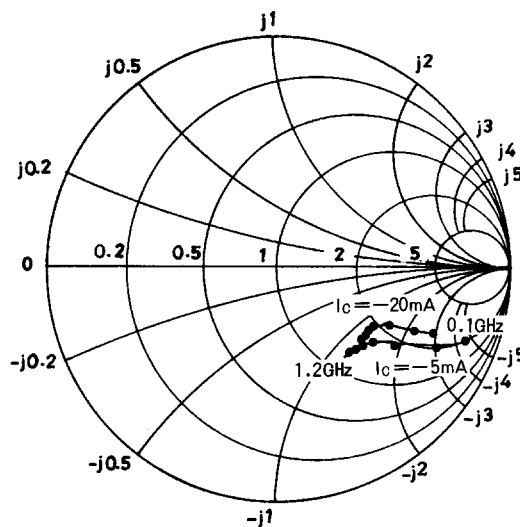
**S21e**:  $V_{CE} = -10V$

$f = 100\text{MHz}, 200 \text{ to } 1200\text{MHz} (200\text{MHz step})$



**S22e**:  $V_{CE} = -10V$

$f = 100\text{MHz}, 200 \text{ to } 1200\text{MHz} (200\text{MHz step})$



## S Parameter (Common-emitter)

$V_{CE} = -10V, I_C = -5mA, Z_0 = 50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.707	-33.1	8.215	151.1	0.043	68.6	0.856	-19.8
200	0.589	-60.3	6.763	132.2	0.059	62.0	0.761	-25.4
400	0.435	-104.7	4.810	106.5	0.089	56.4	0.584	-34.2
600	0.373	-128.1	3.503	93.2	0.110	57.3	0.508	-36.6
800	0.349	-144.4	2.728	83.4	0.130	59.5	0.474	-39.0
900	0.346	-150.1	2.492	80.0	0.142	60.9	0.464	-40.3
1000	0.344	-155.4	2.266	76.8	0.154	61.4	0.459	-41.7
1200	0.340	-163.6	1.971	70.6	0.176	62.1	0.452	-45.2

$V_{CE} = -10V, I_C = -20mA, Z_0 = 50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.348	-92.8	12.039	129.4	0.031	67.3	0.727	-22.9
200	0.330	-116.7	9.073	118.2	0.041	66.0	0.634	-24.8
400	0.350	-151.2	4.962	95.1	0.068	67.7	0.510	-26.5
600	0.353	-164.5	3.408	84.4	0.093	69.9	0.481	-28.1
800	0.360	-172.9	2.591	76.4	0.118	71.6	0.470	-31.1
900	0.366	-176.2	2.346	73.3	0.131	72.0	0.467	-32.9
1000	0.371	-178.4	2.142	70.8	0.146	71.8	0.467	-34.8
1200	0.379	176.2	1.851	65.2	0.171	71.1	0.466	-39.1

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