

SANYO

No.5433

FC157

NPN Epitaxial Planar Silicon Composite Transistor

High-Frequency Low-Noise Amp,
Differential Amp Applications**Features**

- Composite type with 2 transistors contained in the CP package currently in use, improving the mounting efficiency greatly.
- The FC157 is formed with two chips, each being equivalent to the 2SC5245, placed in one package.
- Excellent in thermal equilibrium and in inter-chip characteristic matching.

Absolute Maximum Ratings at Ta=25°C

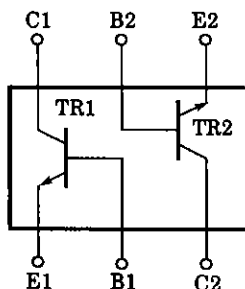
				unit
Collector-to-Base Voltage	V _{CB0}		20	V
Collector-to-Emitter Voltage	V _{CEO}		10	V
Emitter-to-Base Voltage	V _{EBO}		1.5	V
Collector Current	I _C		30	mA
Collector Dissipation	P _C	1 unit	200	mW
Total Dissipation	P _T		300	mW
Junction Temperature	T _j		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C

Electrical Characteristics at Ta=25°C

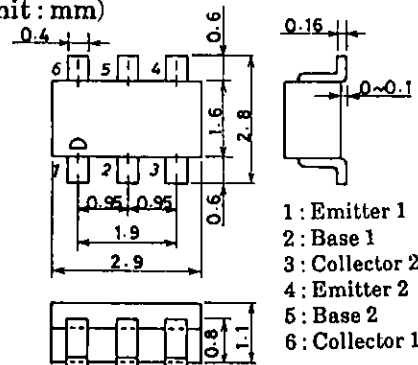
			min	typ	max	unit
Collector Cutoff Current	I _{CB0}	V _{CB} =10V, I _E =0			1.0	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} =1V, I _C =0			10	μA
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =10mA	90		200	
DC Current Gain Ratio	h _{FE} (small/large)	V _{CE} =5V, I _C =10mA	0.7	0.95		
Base-to-Emitter Voltage Difference	V _{BE} (large-small)	V _{CE} =5V, I _C =10mA		1.0		mV
Gain-Bandwidth Product	f _T (1)	V _{CE} =5V, I _C =10mA	8	11		GHz
	f _T (2)	V _{CE} =1V, I _C =1mA		7		GHz
Output Capacitance	C _{ob}	V _{CB} =10V, f=1MHz		0.45	0.7	pF
Reverse Transfer Capacitance	C _{re}	V _{CB} =10V, f=1MHz		0.30		pF
Forward Transfer Gain	S _{21e} ² (1)	V _{CE} =5V, I _C =10mA, f=1.5GHz	8	10		dB
	S _{21e} ² (2)	V _{CE} =1V, I _C =1mA, f=1.5GHz		5.5		dB
Noise Figure	NF(1)	V _{CE} =5V, I _C =5mA, f=1.5GHz		1.4	3.0	dB
	NF(2)	V _{CE} =2V, I _C =3mA, f=1GHz		0.9		dB

Note) The specifications shown above are for each individual transistor.

Marking : 157

Electrical Connection**Package Dimensions 2067A**

(unit : mm)

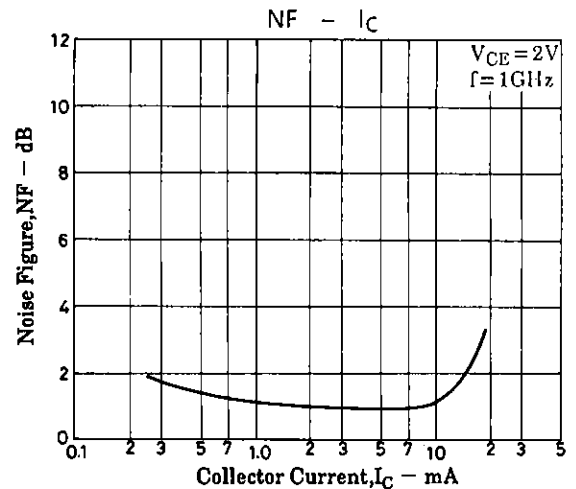
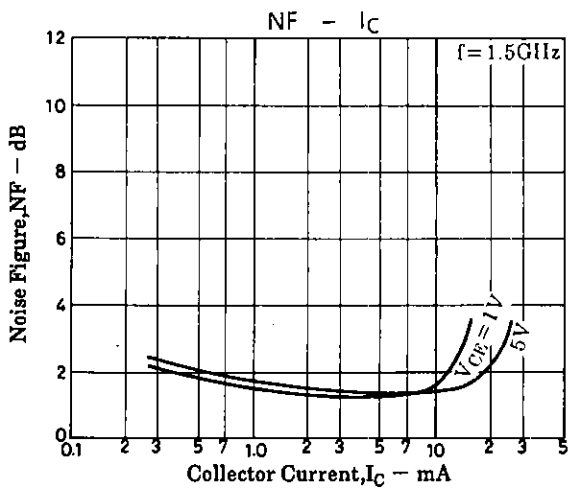
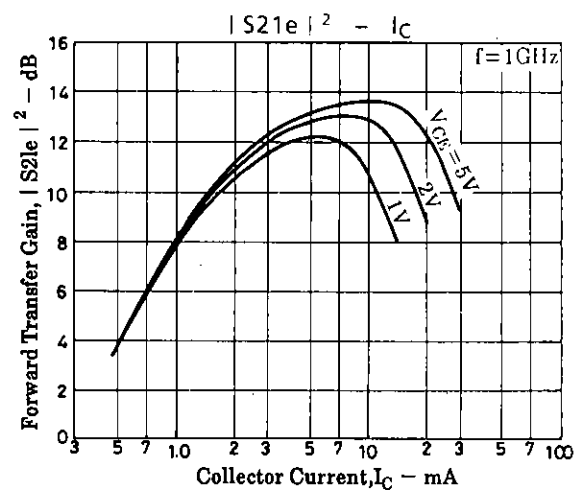
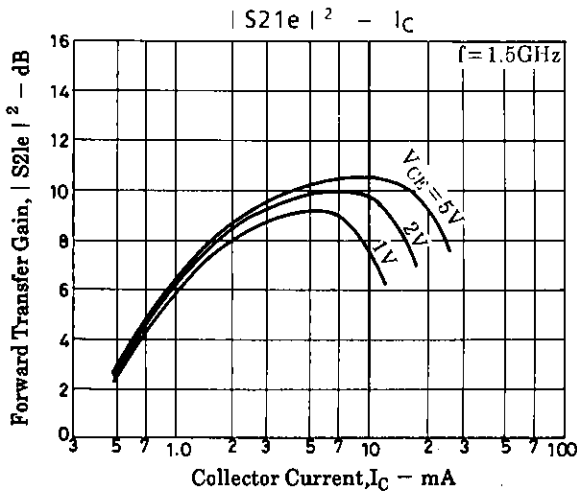
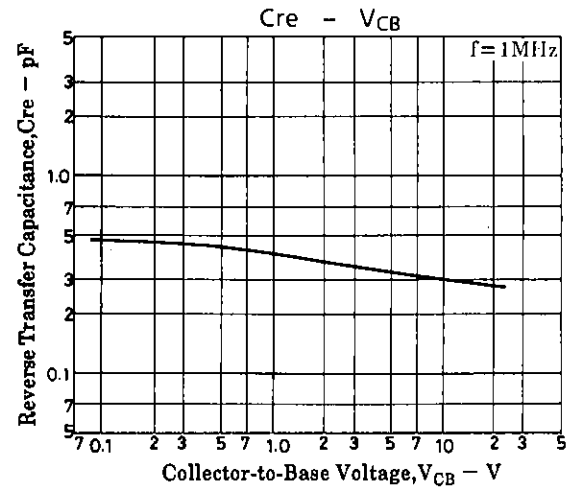
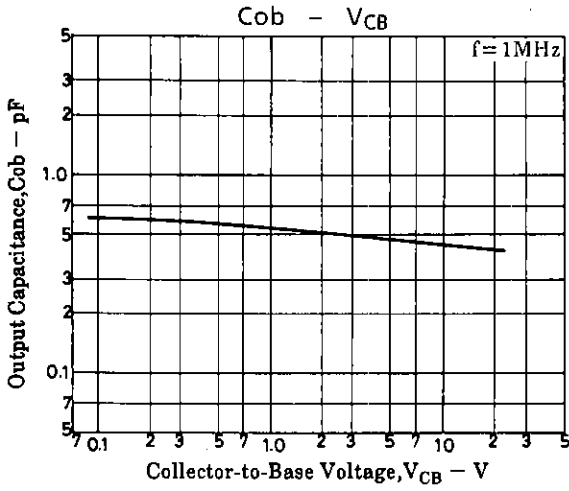
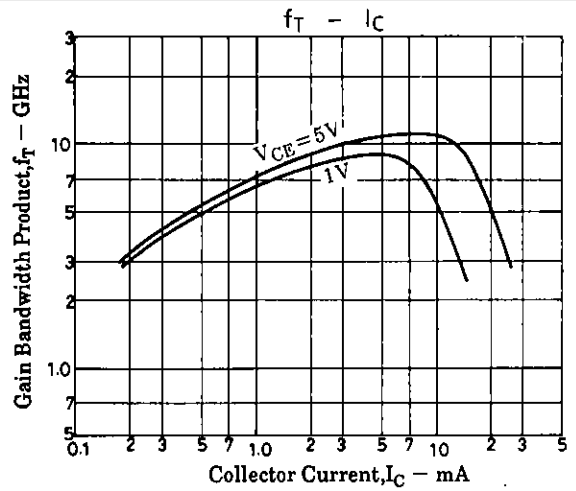
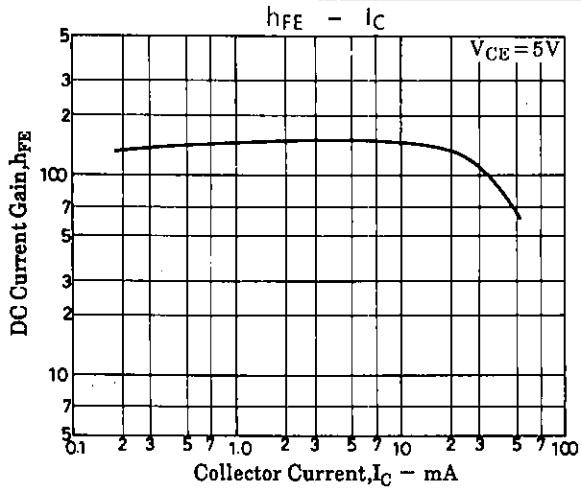


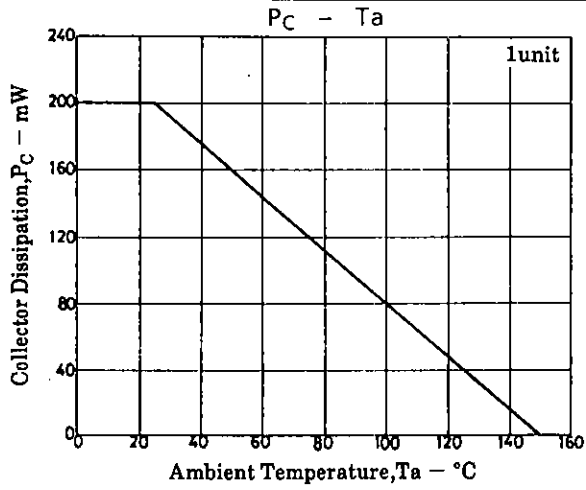
1: Emitter 1
2: Base 1
3: Collector 2
4: Emitter 2
5: Base 2
6: Collector 1
SANYO : CP6

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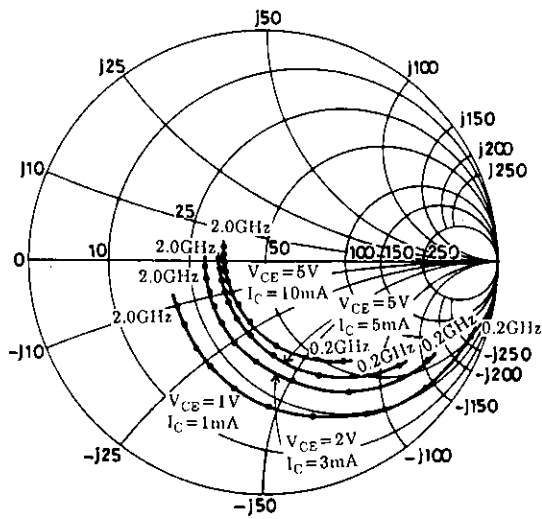
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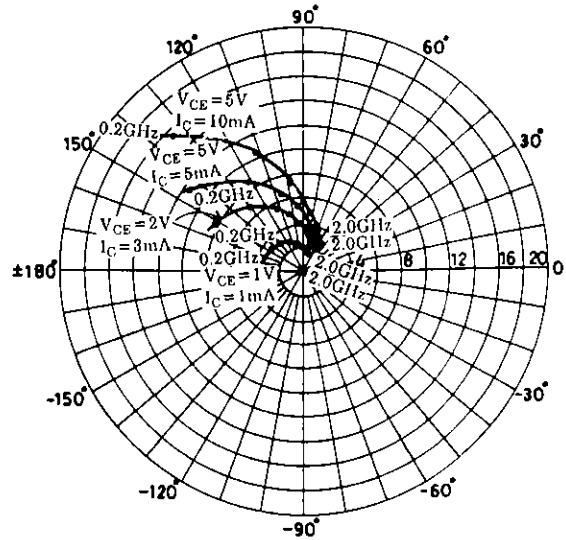


S Parameters

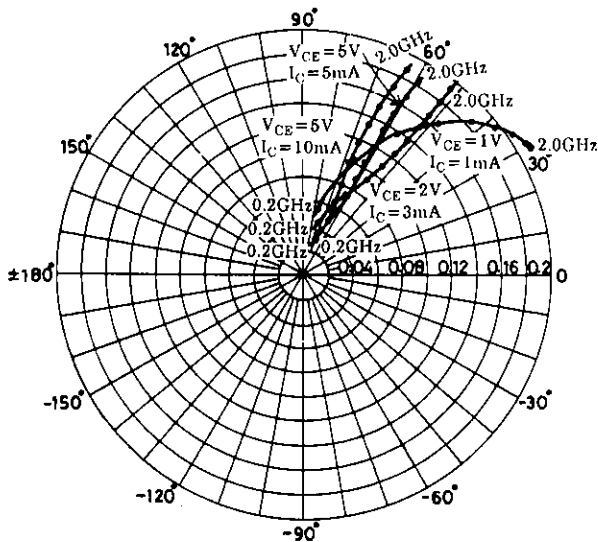
S11e : $f = 200$ to $2000MHz$ (200MHz step)



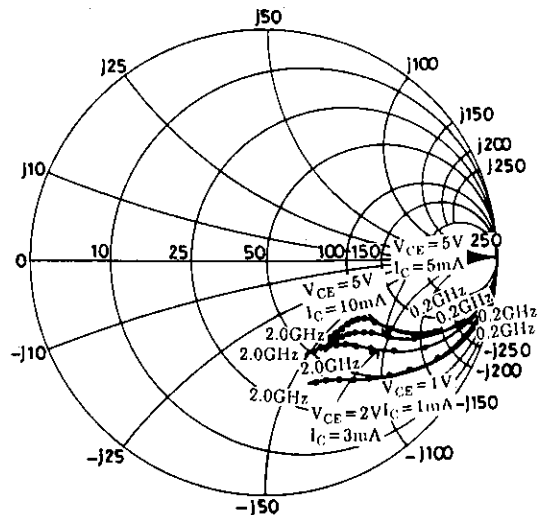
S21e : $f = 200$ to $2000MHz$ (200MHz step)



S12e : $f = 200$ to $2000MHz$ (200MHz step)



S22e : $f = 200$ to $2000MHz$ (200MHz step)



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S Parameters (Common emitter)

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.725	-37.6	11.573	144.6	0.035	71.3	0.885	-18.7
400	0.540	-64.0	8.744	122.0	0.058	63.0	0.731	-27.7
600	0.400	-83.2	6.691	107.0	0.074	60.6	0.628	-31.4
800	0.320	-98.5	5.357	96.6	0.089	60.8	0.562	-33.3
1000	0.263	-112.1	4.503	88.5	0.104	61.0	0.527	-35.1
1200	0.221	-127.8	3.874	81.2	0.119	60.7	0.503	-37.5
1400	0.199	-140.4	3.409	74.6	0.135	60.7	0.487	-40.1
1600	0.180	-154.5	2.984	68.5	0.150	60.7	0.473	-43.3
1800	0.169	-169.9	2.710	63.0	0.167	59.9	0.463	-46.8
2000	0.168	176.2	2.486	58.2	0.183	59.4	0.462	-50.4

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.547	-51.4	15.617	133.5	0.031	69.6	0.799	-22.7
400	0.364	-80.4	10.257	111.4	0.049	65.8	0.628	-27.9
600	0.261	-99.7	7.389	98.8	0.065	66.3	0.548	-28.7
800	0.202	-116.9	5.761	89.9	0.081	67.4	0.501	-29.6
1000	0.177	-132.9	4.763	83.2	0.099	67.7	0.481	-31.1
1200	0.157	-150.3	4.055	76.5	0.117	67.0	0.467	-33.5
1400	0.150	-164.6	3.545	71.0	0.134	66.4	0.458	-36.3
1600	0.148	-179.2	3.111	65.6	0.151	65.7	0.448	-40.0
1800	0.154	169.8	2.814	60.5	0.170	64.3	0.441	-43.9
2000	0.162	157.5	2.565	56.0	0.187	63.4	0.440	-47.8

$V_{CE}=2V, I_C=3mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.814	-31.0	8.333	151.1	0.044	72.9	0.924	-17.0
400	0.664	-56.7	6.925	129.6	0.074	61.9	0.793	-28.4
600	0.526	-75.9	5.576	113.7	0.094	56.2	0.683	-34.9
800	0.430	-92.7	4.639	101.8	0.109	54.1	0.598	-39.1
1000	0.364	-107.1	3.950	92.7	0.124	53.1	0.547	-42.1
1200	0.310	-121.7	3.449	84.3	0.138	52.3	0.510	-44.9
1400	0.274	-134.9	3.048	76.9	0.152	52.2	0.485	-48.0
1600	0.247	-148.7	2.706	70.1	0.165	52.1	0.464	-51.6
1800	0.237	-162.4	2.446	64.0	0.180	52.0	0.450	-55.2
2000	0.233	-174.5	2.250	58.7	0.193	52.0	0.444	-58.8

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$V_{CE} = 1V, I_C = 1mA, Z_O = 50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.937	-19.9	3.404	161.1	0.055	77.0	0.978	-11.1
400	0.876	-38.2	3.198	144.6	0.102	65.7	0.926	-21.1
600	0.780	-56.2	2.929	128.8	0.138	56.2	0.858	-29.5
800	0.699	-72.0	2.656	115.8	0.164	48.7	0.784	-36.7
1000	0.619	-87.4	2.478	104.2	0.185	42.8	0.734	-42.1
1200	0.553	-101.1	2.224	93.8	0.196	37.8	0.677	-47.7
1400	0.498	-114.4	2.062	84.1	0.204	34.1	0.639	-52.5
1600	0.457	-125.9	1.843	75.6	0.209	31.5	0.610	-56.9
1800	0.418	-139.7	1.722	67.5	0.201	30.5	0.580	-61.4
2000	0.398	-151.1	1.592	60.9	0.210	30.3	0.567	-65.2

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