

SANYO	No.4857	2SC4871
		NPN Epitaxial Planar Silicon Transistor UHF to S Band Low-Noise Amp, OSC Applications

Features

- High cutoff frequency : $f_T = 10\text{GHz typ.}$
- High gain : $|S_{21e}|^2 = 13\text{dB typ (} f = 1\text{GHz).}$
- Low noise : $NF = 1.3\text{dB typ (} f = 1\text{GHz).}$
- Small Cob : $C_{ob} = 0.4\text{pF typ.}$

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

			unit
Collector-to-Base Voltage	V_{CB0}	16	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 Dissipation	P_C	100	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

			min	typ	max	unit
Collector Cutoff Current	I_{CB0}	$V_{CB} = 10\text{V}, I_E = 0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 1\text{V}, I_C = 0$			10	μA
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 4\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE} = 5\text{V}, I_C = 4\text{mA}$		10		GHz
Output Capacitance	Cob	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.4	0.7	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{V}, I_C = 7\text{mA}, f = 1\text{GHz}$	10	13		dB
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 4\text{mA}, f = 1\text{GHz}$		1.3	2.8	dB

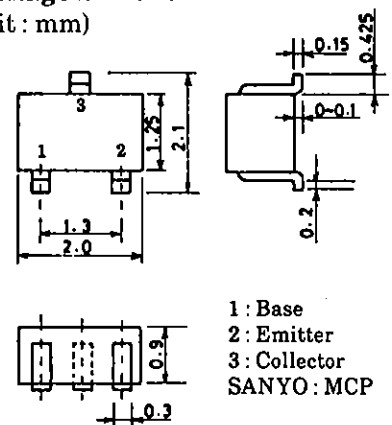
* : The 2SC4871 is classified by 4mA h_{FE} as follows :

60	3	120	90	4	180	135	5	270
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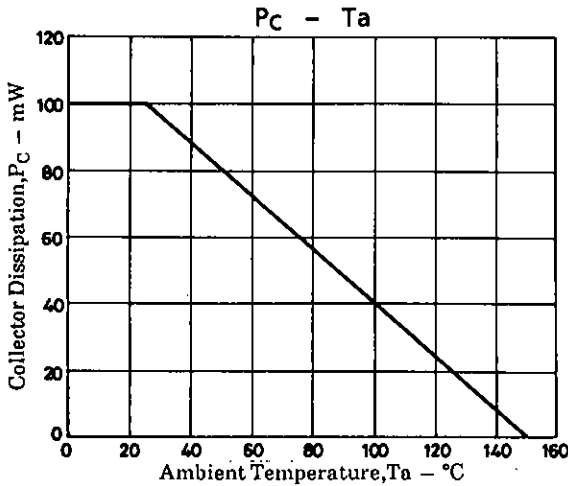
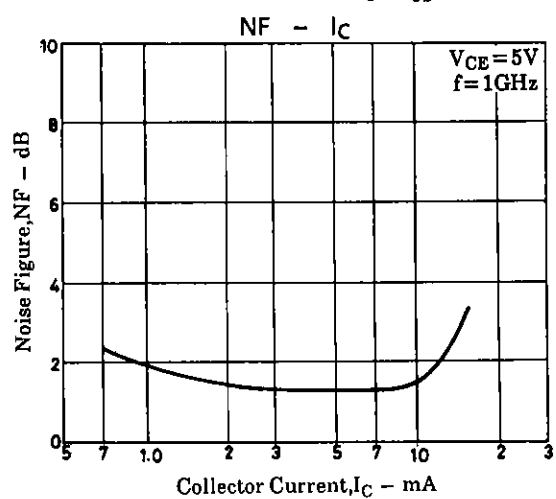
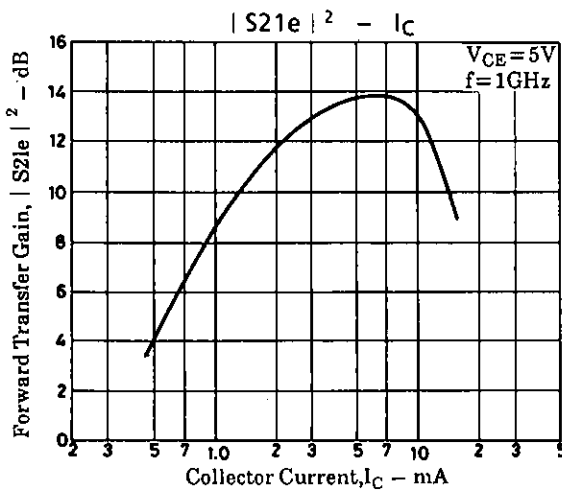
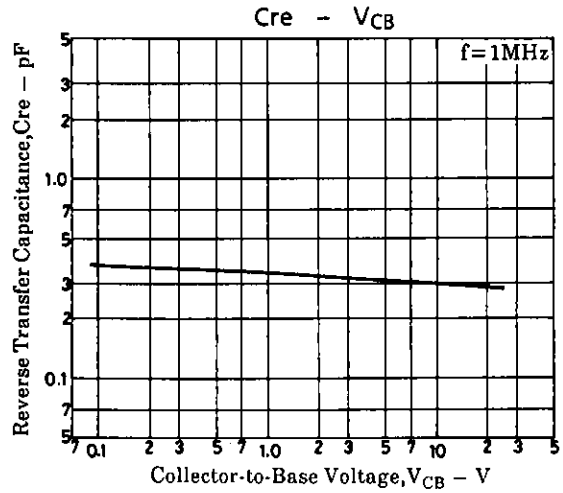
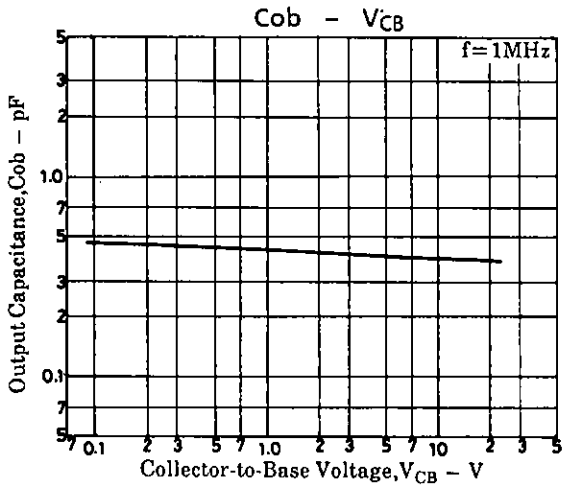
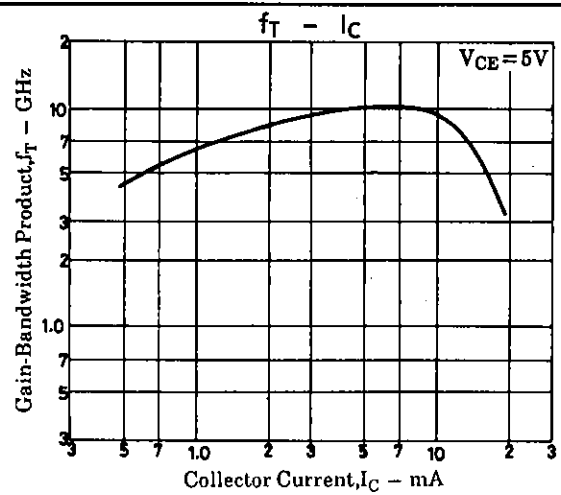
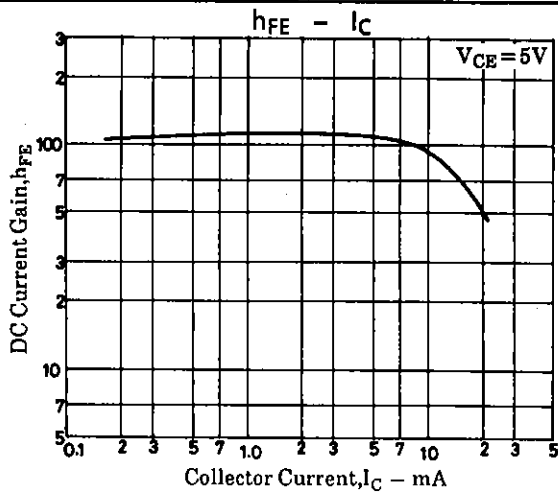
Marking : HN

h_{FE} rank : 3, 4, 5

Package Dimensions 2059A
(unit: mm)

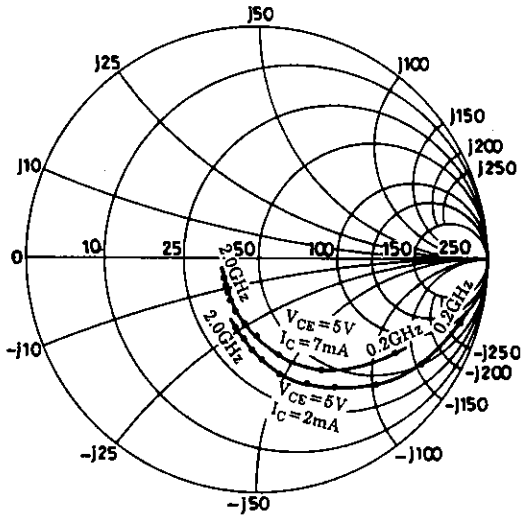


1: Base
2: Emitter
3: Collector
SANYO: MCP

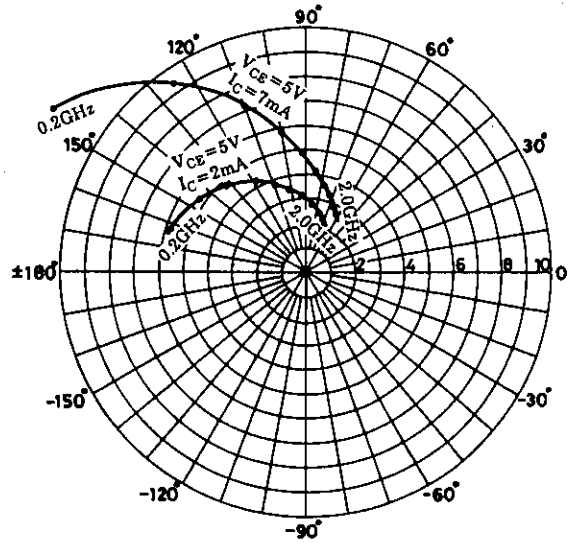


S Parameter

f = 200 to 2000MHz (200MHz Step)

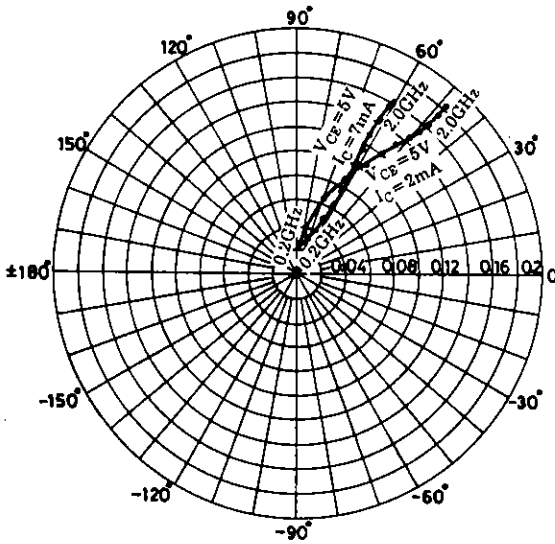


f = 200 to 2000MHz (200MHz Step)

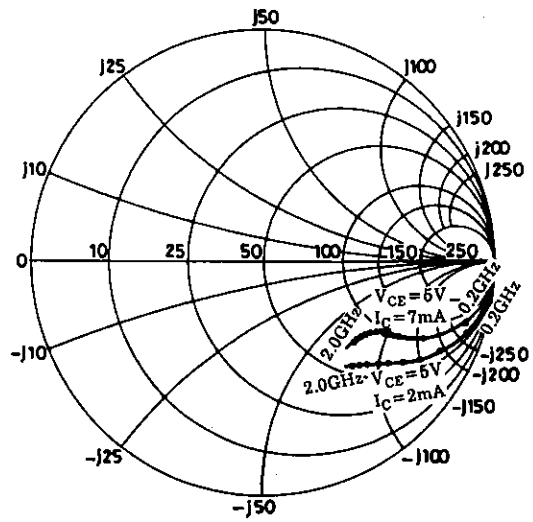


$V_{CE} = 5V$

f = 200 to 2000MHz (200MHz Step)



f = 200 to 2000MHz (200MHz Step)



S Parameter (Common emitter)

 $V_{CE}=5V, I_C=2mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.912	-17.6	5.764	161.5	0.034	79.0	0.974	-10.3
400	0.835	-33.0	5.282	145.5	0.065	69.9	0.919	-19.2
600	0.742	-46.9	4.753	131.2	0.088	62.8	0.850	-26.3
800	0.649	-58.9	4.268	119.4	0.107	57.9	0.789	-31.6
1000	0.578	-68.7	3.840	109.4	0.121	54.5	0.740	-35.5
1200	0.512	-78.1	3.440	100.5	0.134	52.2	0.698	-38.9
1400	0.445	-86.3	3.123	92.5	0.145	50.3	0.664	-41.6
1600	0.400	-93.0	2.836	85.2	0.154	49.2	0.638	-44.3
1800	0.359	-98.5	2.588	79.0	0.164	48.4	0.615	-46.3
2000	0.319	-106.6	2.397	73.0	0.174	47.9	0.601	-48.3

 $V_{CE}=5V, I_C=7mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.721	-35.1	12.262	147.1	0.030	72.8	0.900	-16.9
400	0.555	-59.9	9.445	124.9	0.050	64.4	0.763	-25.6
600	0.428	-77.5	7.290	110.2	0.065	61.9	0.666	-29.3
800	0.344	-89.9	5.877	100.1	0.078	61.5	0.611	-31.1
1000	0.291	-100.6	4.911	92.1	0.091	61.7	0.583	-32.5
1200	0.254	-110.9	4.223	85.1	0.104	61.5	0.563	-34.1
1400	0.221	-121.4	3.703	79.0	0.117	61.6	0.551	-35.7
1600	0.197	-128.9	3.294	73.6	0.129	61.6	0.540	-37.8
1800	0.178	-136.7	2.946	68.5	0.143	61.1	0.530	-39.7
2000	0.171	-148.6	2.692	63.8	0.157	60.7	0.529	-41.7

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