Ordering number:EN4856

NPN Epitaxial Planar Silicon Transistor

2SC4867

VHF to UHF Wide-Band Low-Noise Amplifier Applications

Features

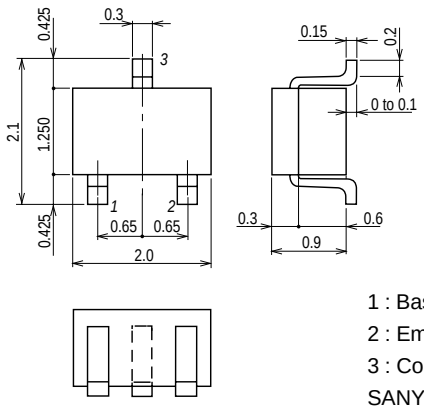
- Low noise : NF=1.2dB typ (f=1GHz).
- High gain : $|S21e|^2$=13dB typ (f=1GHz).
- High cutoff frequency : f_T=9.0GHz typ.

Package Dimensions

unit:mm

2059B

[2SC4867]



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

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		16	V
Collector-to-Emitter Voltage	V_{CEO}		8	V
Emitter-to-Base Voltage	V_{EBO}		1.5	V
Collector Current	I_C		50	mA
Collector Dissipation	P_C		150	mW
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	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=15mA	60*		270*	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=15mA		9.0		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		0.6	1.1	pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=5V, I_C=15mA, f=1GHz	10	13		dB
Noise Figure	NF	V_{CE}=5V, I_C=5mA, f=1GHz		1.2	2.5	dB

* : The 2SC4867 is classified by 15mA h_{FE} as follows :

60	3	120	90	4	180	135	5	270

Marking : GN

h_{FE} rank : 3, 4, 5

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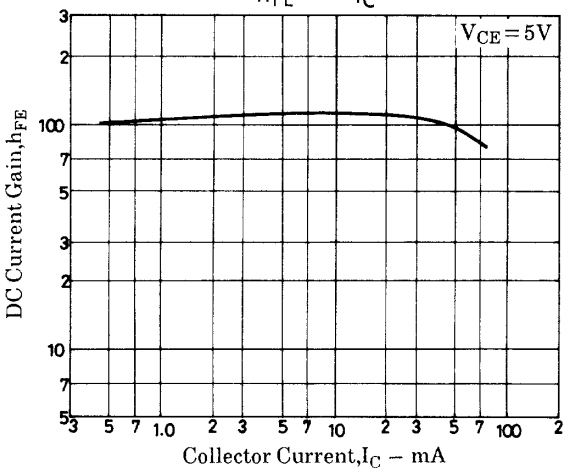
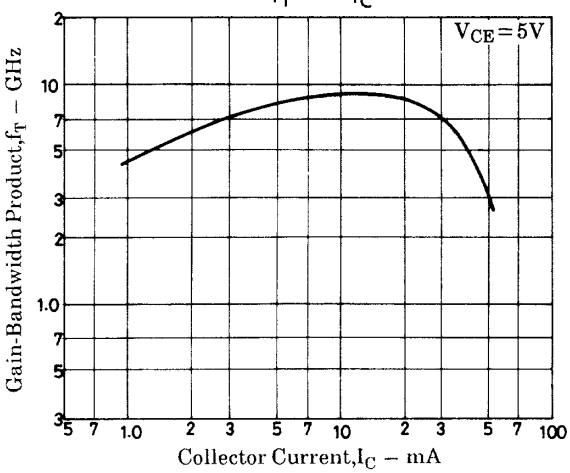
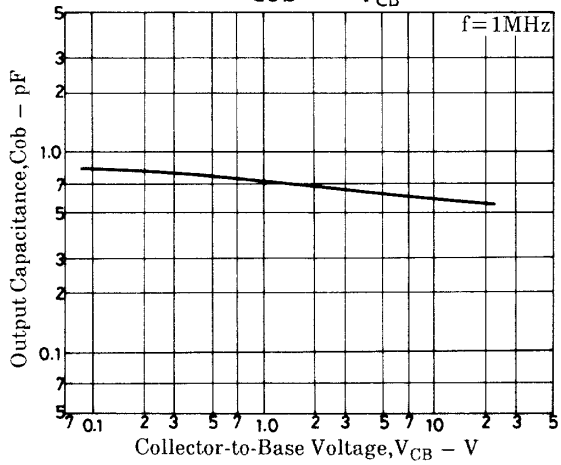
h_{FE} – I_C



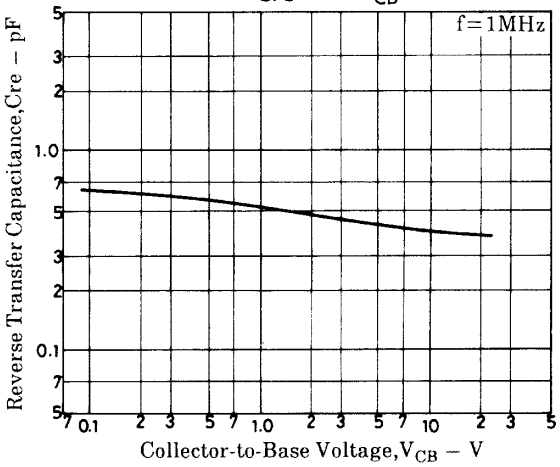
f_T – I_C



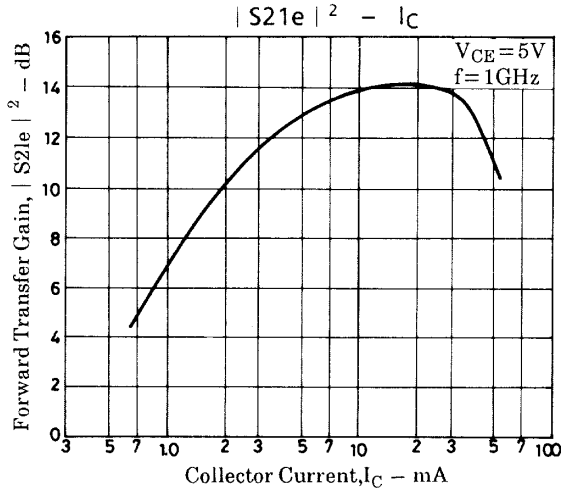
Cob – V_{CB}



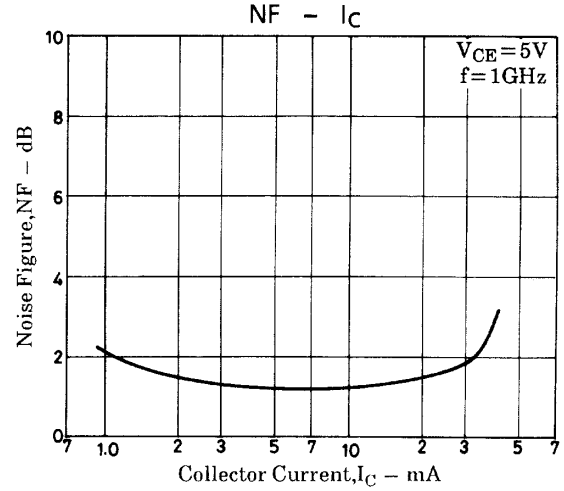
Cre – V_{CB}



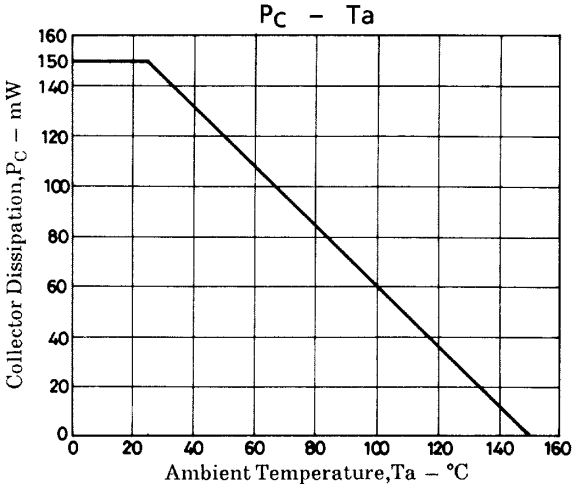
$|S21e|^2$ – I_C



NF – I_C

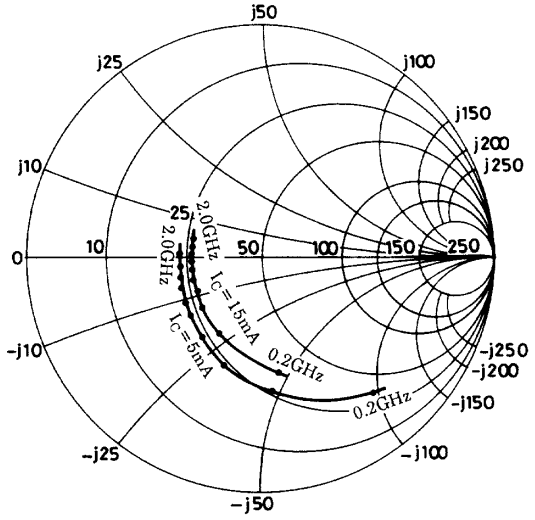


P_C – Ta

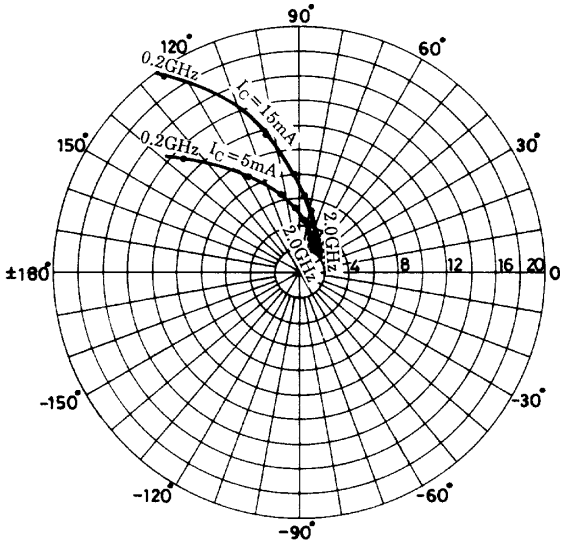


S parameter

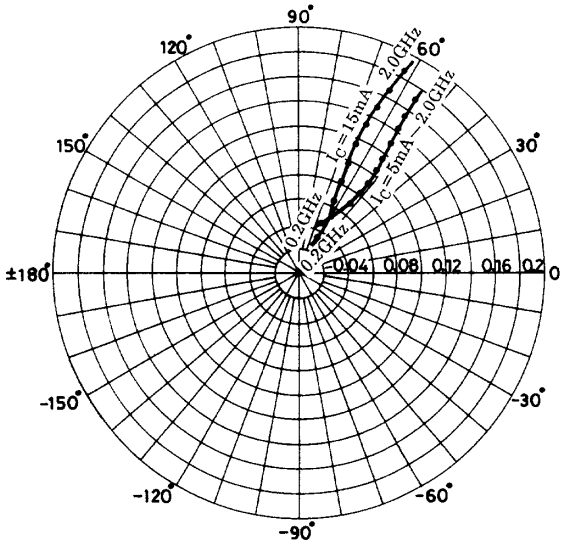
V_{CE} = 5V
f = 200 to 2000MHz (200MHz Step)



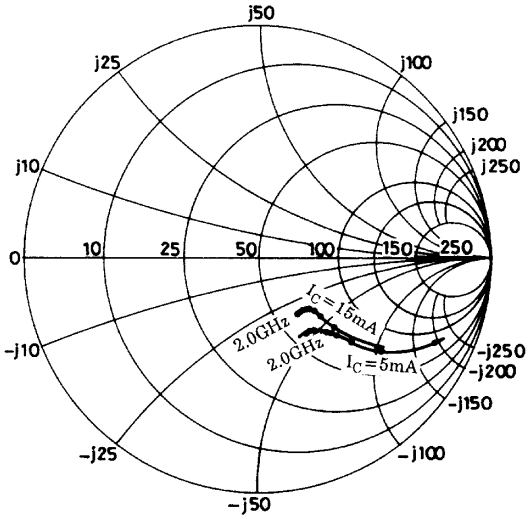
V_{CE} = 5V
f = 200 to 2000MHz (200MHz Step)



V_{CE} = 5V
f = 200 to 2000MHz (200MHz Step)



V_{CE} = 5V
f = 200 to 2000MHz (200MHz Step)



S parameter (Common emitter)

V_{CE}=5V, I_C=5mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
200	0.749	–50.7	12.229	141.6	0.044	65.4	0.847	–25.4
400	0.583	–85.7	8.900	118.1	0.068	54.3	0.655	–37.4
600	0.487	–109.6	6.636	103.7	0.081	51.6	0.538	–42.3
800	0.428	–126.6	5.276	93.9	0.093	51.6	0.473	–44.4
1000	0.405	–139.3	4.379	85.9	0.106	52.6	0.443	–46.2
1200	0.387	–150.6	3.731	78.7	0.117	53.6	0.421	–48.1
1400	0.377	–160.1	3.258	72.6	0.130	54.4	0.405	–49.6
1600	0.365	–166.8	2.924	67.5	0.142	55.2	0.393	–52.1
1800	0.362	–174.3	2.589	61.9	0.156	55.6	0.387	–54.3
2000	0.361	178.3	2.363	56.8	0.171	55.9	0.383	–56.4

V_{CE}=5V, I_C=15mA, Z_O=50Ω

Freq (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
200	0.507	–81.6	19.422	124.2	0.033	61.9	0.650	–36.9
400	0.382	–119.5	11.595	103.8	0.050	61.0	0.445	–43.0
600	0.341	–140.9	8.046	93.3	0.065	63.3	0.365	–43.5
800	0.332	–154.0	6.182	86.4	0.081	65.1	0.330	–43.3
1000	0.320	–163.0	5.063	79.8	0.099	65.6	0.318	–43.8
1200	0.316	–170.9	4.263	74.1	0.116	65.7	0.311	–45.9
1400	0.315	–178.0	3.716	69.2	0.134	65.0	0.304	–47.4
1600	0.314	176.7	3.270	64.3	0.150	64.4	0.297	–50.3
1800	0.311	171.2	2.922	60.0	0.167	63.3	0.293	–52.6
2000	0.313	165.4	2.656	55.9	0.186	62.1	0.295	–54.8

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