Ordering number:EN5044

NPN Epitaxial Planar Silicon Transistor

2SC4869

VHF to UHF Wide-Band Low-Noise Amplifier Applications

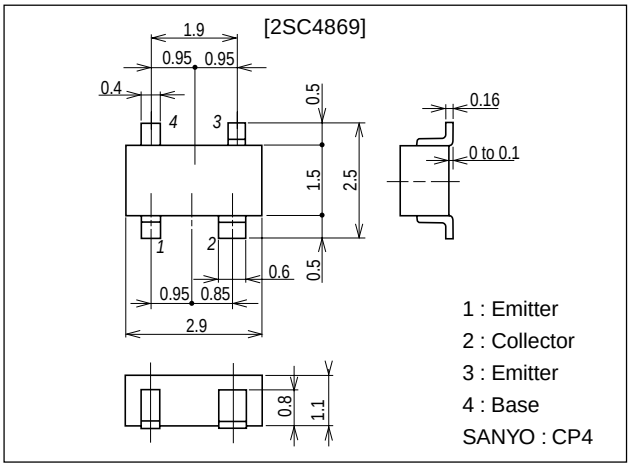
Features

- Low noise : NF=1.2dB typ (f=1GHz).
- High gain : $|S21e|^2$=15dB typ (f=1GHz).
- High cutoff frequency : f_T=9.0GHz typ.

Package Dimensions

unit:mm

2110A



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		200	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	12	15		dB
Noise Figure	NF	V_{CE}=5V, I_C=5mA, f=1GHz		1.2	2.5	dB

* : The 2SC4869 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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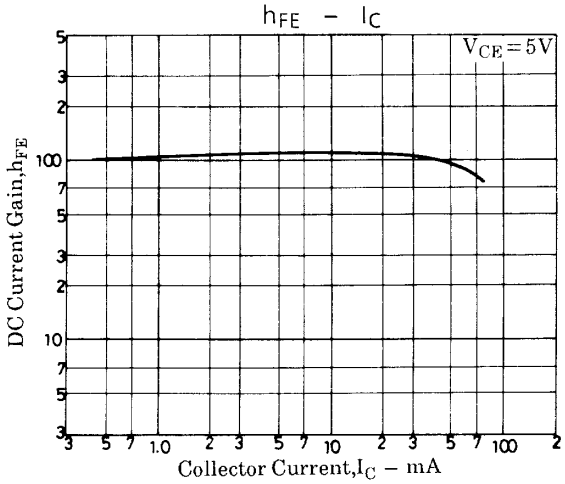
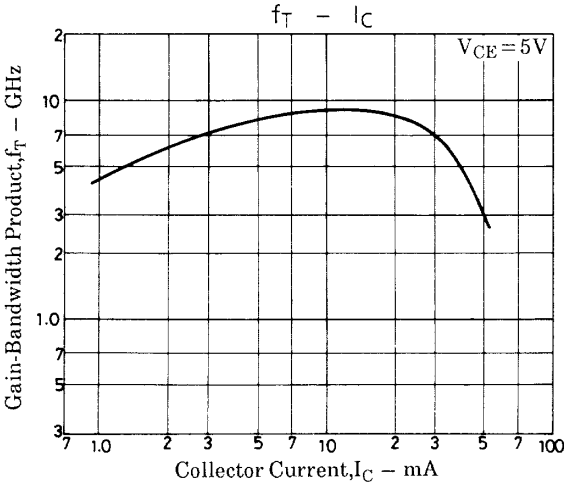
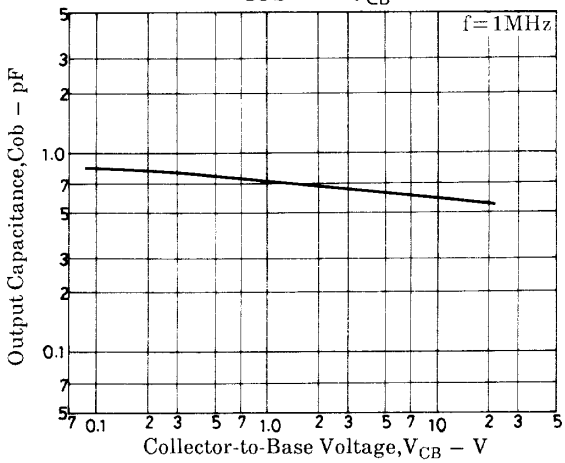
h_{FE} – I_C



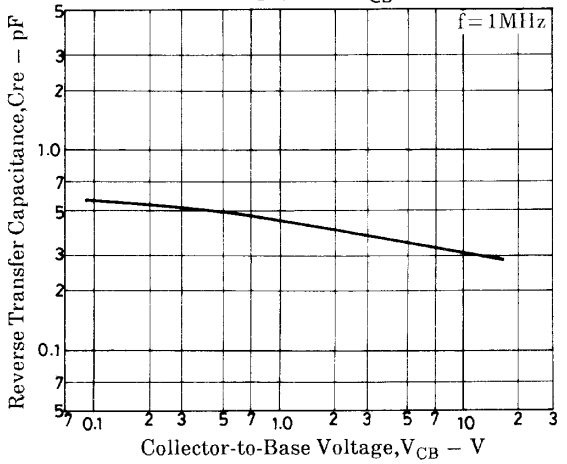
f_T – I_C



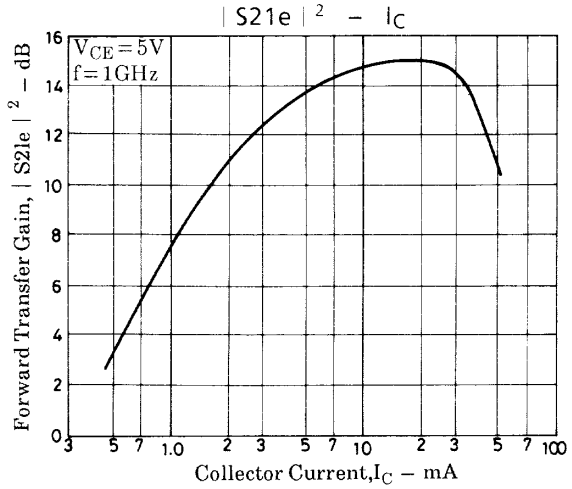
Cob – V_{CB}



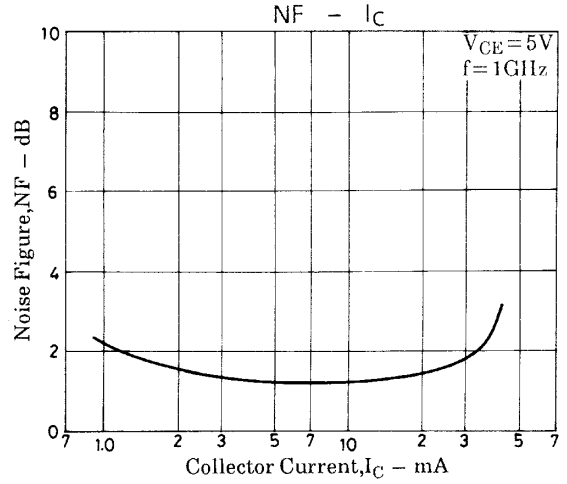
Cre – V_{CB}



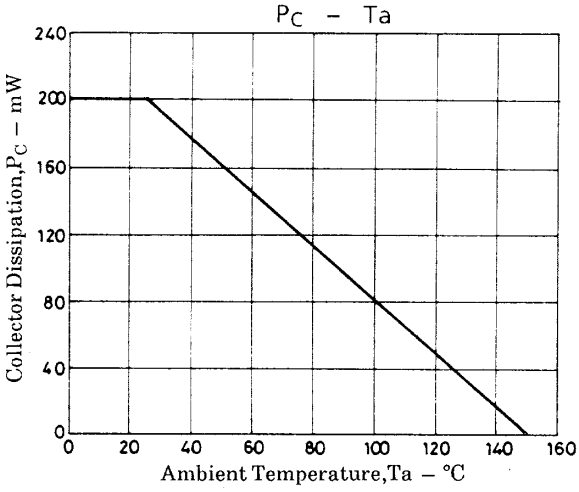
$|S21e|^2$ – I_C



NF – I_C

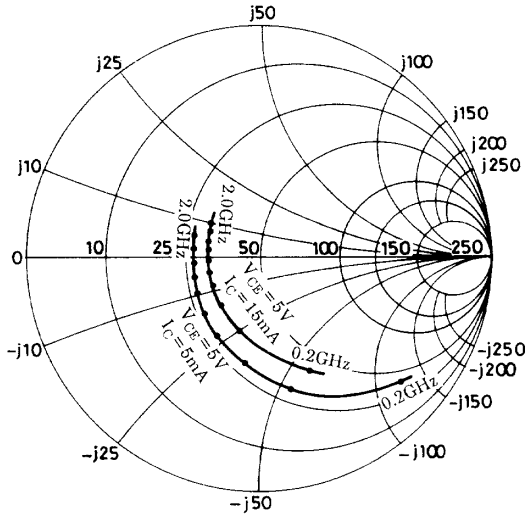


P_C – Ta

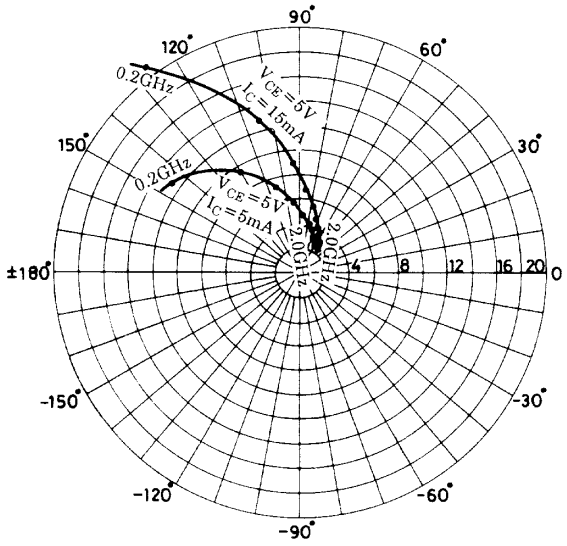


S parameter

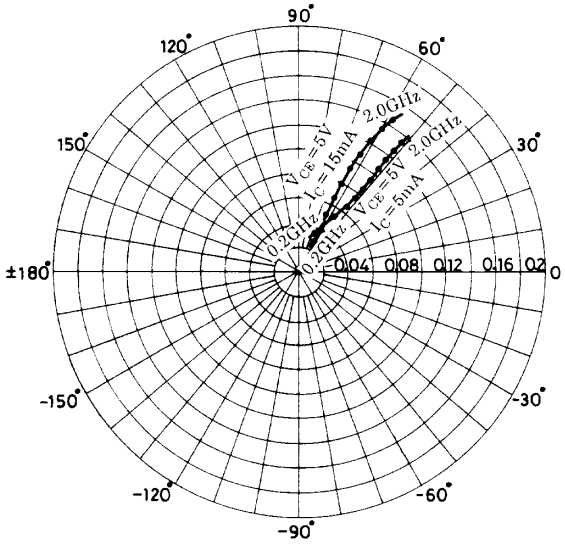
f=200 to 2000MHz (200MHz step)



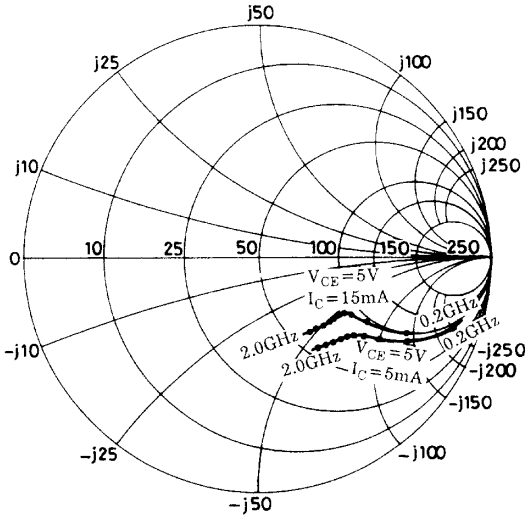
f=200 to 2000MHz (200MHz step)



f=200 to 2000MHz (200MHz step)



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	0.782	–43.7	12.681	144.2	0.034	68.1	0.883	–19.9
400	0.591	–76.4	9.601	120.2	0.054	56.7	0.727	–29.9
600	0.467	–100.3	7.329	105.2	0.066	52.9	0.624	–34.5
800	0.393	–119.8	5.828	94.1	0.076	51.8	0.564	–37.4
1000	0.346	–135.3	4.831	85.6	0.090	51.8	0.532	–40.1
1200	0.322	–150.3	4.109	78.1	0.095	52.2	0.513	–42.5
1400	0.304	–163.6	3.585	71.7	0.106	52.2	0.499	–45.4
1600	0.299	–175.3	3.715	65.2	0.116	52.2	0.487	–49.0
1800	0.296	173.4	2.873	59.8	0.126	52.0	0.477	–52.7
2000	0.301	162.9	2.618	54.1	0.135	51.5	0.472	–57.0

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	0.525	–69.3	20.888	126.3	0.027	64.4	0.710	–28.0
400	0.347	–106.8	12.787	104.6	0.040	62.3	0.540	–32.0
600	0.281	–131.5	8.978	93.2	0.053	63.6	0.472	–32.8
800	0.251	–150.6	6.897	85.1	0.067	64.2	0.442	–34.3
1000	0.240	–164.7	5.584	78.6	0.080	64.0	0.428	–37.1
1200	0.235	–177.5	4.715	72.6	0.094	63.8	0.421	–39.6
1400	0.237	172.0	4.090	67.2	0.108	62.7	0.414	–42.9
1600	0.242	163.7	3.615	62.0	0.122	61.4	0.406	–47.1
1800	0.251	154.1	3.240	57.2	0.135	59.9	0.400	–51.3
2000	0.264	145.5	2.943	52.3	0.147	58.0	0.398	–56.0

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