

SANYO	No.4583	2SC4864
		NPN Epitaxial Planar Silicon Transistor VHF to UHF Wide-Band Low-Noise Amp Applications

Features

- Low noise : $NF = 1.1\text{dB typ (}f = 1\text{GHz)}$
- High gain : $|S_{21e}|^2 = 11\text{dB typ (}f = 1\text{GHz)}$
- High cutoff frequency : $f_T = 7.0\text{GHz typ}$

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}	2	V
Collector Current	I_C	70	mA
Collector Dissipation	P_C	200	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

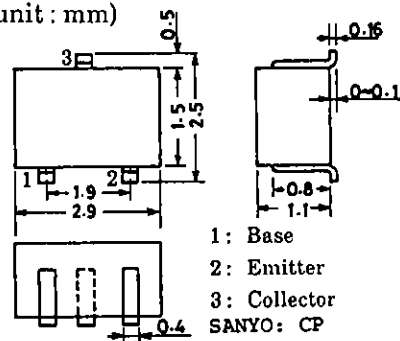
			min	typ	max	unit
Collector Cutoff Current	I_{CB0}	$V_{CB} = 10\text{V}, I_E = 0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 1\text{V}, I_C = 0$			10	μA
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$		7.0		GHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.95	1.4	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{V}, I_C = 20\text{mA}, f = 1\text{GHz}$	7	11		dB
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 7\text{mA}, f = 1\text{GHz}$		1.1	2.0	dB

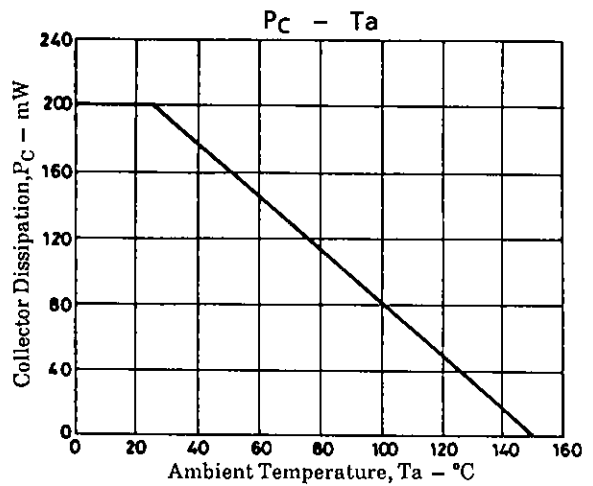
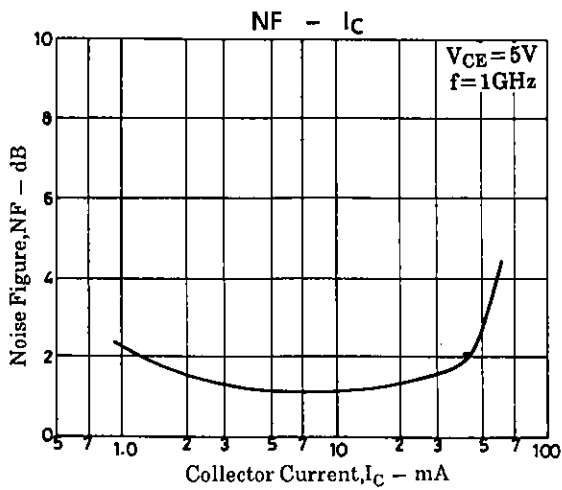
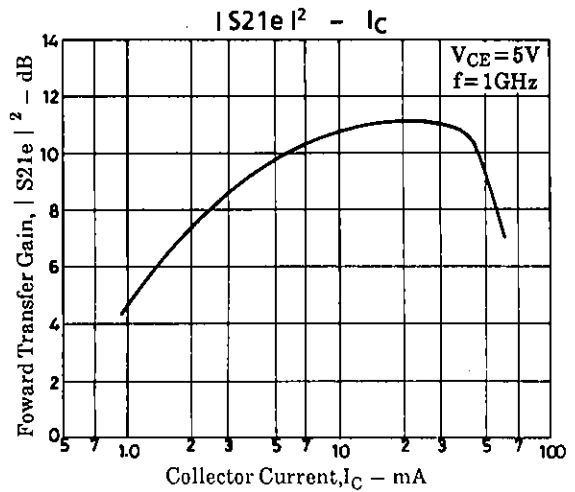
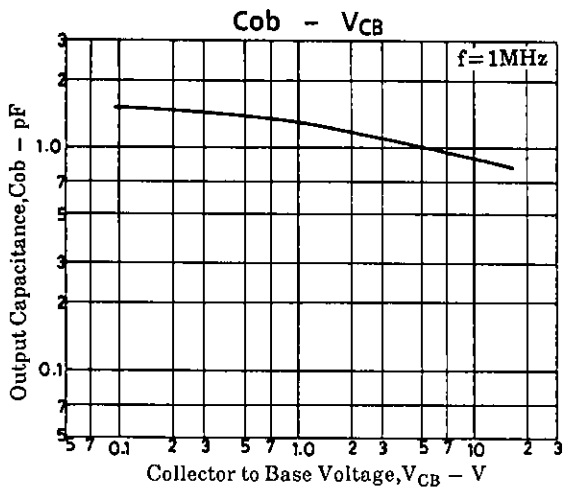
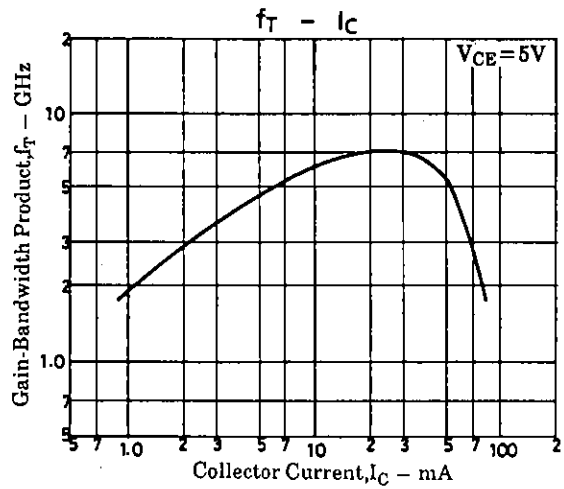
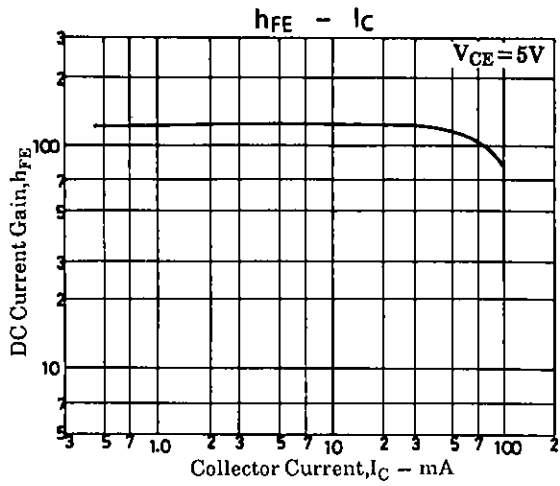
* The 2SC4864 is classified by 20mA h_{FE} as follows :

60 3 120	90 4 180	135 5 270
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Marking : FN
 h_{FE} rank : 3,4,5

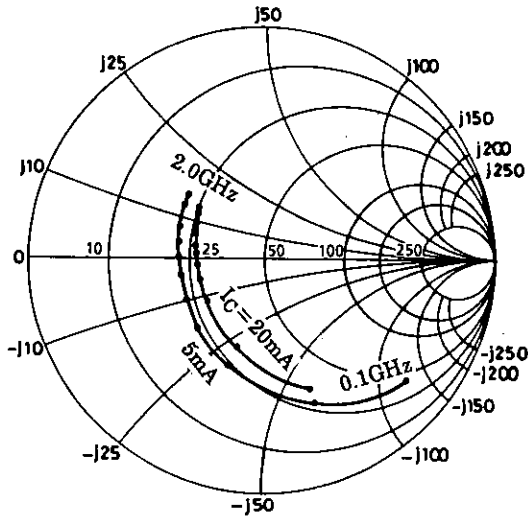
Package Dimensions 2018B
 (unit : mm)



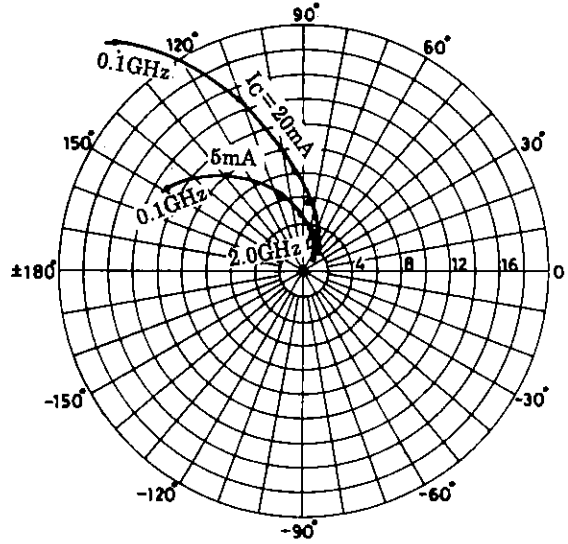


S Parameter

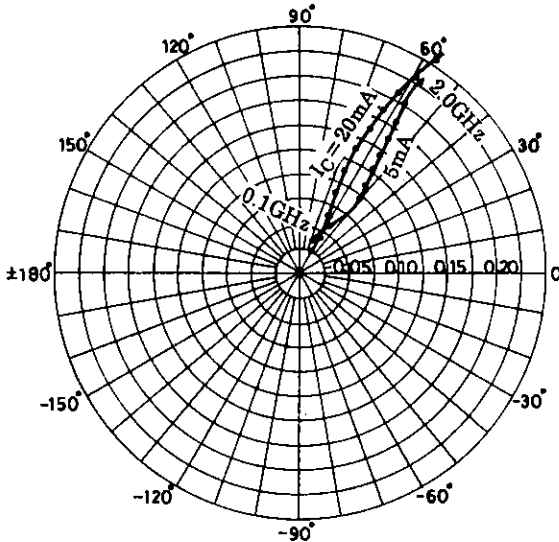
S11e: $V_{CE} = 5V$
 $f = 100MHz, 200 \sim 2000MHz$ (200MHz step)



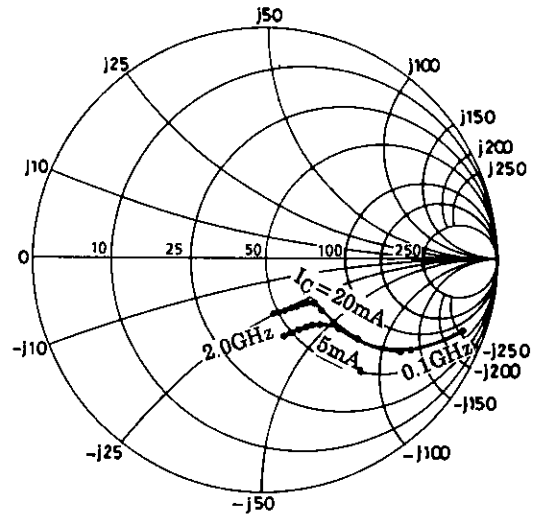
S21e: $V_{CE} = 5V$
 $f = 100MHz, 200 \sim 2000MHz$ (200MHz step)



S12e: $V_{CE} = 5V$
 $f = 100MHz, 200 \sim 2000MHz$ (200MHz step)



S22e: $V_{CE} = 5V$
 $f = 100MHz, 200 \sim 2000MHz$ (200MHz step)



S Parameter (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} $	$\angle S_{22}$
100	0.778	-40.2	13.012	149.1	0.036	68.7	0.893	-20.9
200	0.632	-70.8	10.144	128.7	0.058	57.4	0.729	-32.7
400	0.487	-110.34	6.532	106.1	0.080	50.1	0.523	-41.6
600	0.411	-136.7	4.723	93.2	0.096	50.7	0.436	-44.3
800	0.383	-154.6	3.712	83.1	0.111	52.8	0.388	-46.9
1000	0.379	-168.9	3.065	74.9	0.128	54.5	0.368	-50.3
1200	0.381	-179.0	2.624	67.4	0.146	55.7	0.354	-54.6
1400	0.383	168.7	2.302	61.2	0.163	56.6	0.346	-59.2
1600	0.395	160.2	2.051	54.7	0.182	57.3	0.342	-64.4
1800	0.412	154.1	1.858	50.0	0.202	57.6	0.339	-70.2
2000	0.423	147.1	1.729	44.9	0.227	57.4	0.337	-75.2

 $V_{CE}=5V$, $I_C=20mA$, $Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.517	-70.9	24.026	130.6	0.027	63.8	0.702	-34.9
200	0.384	-108.5	15.011	110.9	0.041	60.5	0.478	-43.3
400	0.310	-144.9	8.261	94.4	0.064	64.0	0.329	-43.8
600	0.301	-164.7	5.701	85.1	0.087	66.0	0.285	-43.8
800	0.299	-176.9	4.392	77.6	0.112	66.5	0.263	-46.5
1000	0.307	173.7	3.586	71.1	0.137	65.6	0.255	-51.1
1200	0.318	165.5	3.035	65.2	0.162	64.2	0.248	-56.9
1400	0.329	158.0	2.650	59.6	0.185	62.7	0.244	-63.1
1600	0.339	151.5	2.345	54.1	0.207	61.1	0.243	-69.8
1800	0.361	147.3	2.126	50.3	0.230	59.6	0.240	-77.1
2000	0.369	142.4	1.977	45.6	0.256	57.7	0.238	-82.6

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