

<b>SANYO</b>	No.4583	<b>2SC4864</b>
		NPN Epitaxial Planar Silicon Transistor <b>VHF to UHF Wide-Band Low-Noise Amp</b> 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  $T_a = 25^\circ\text{C}$**

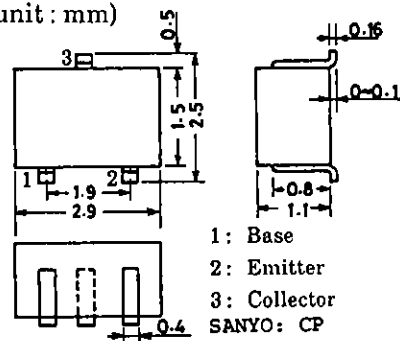
			min	typ	max	unit
Collector Cutoff Current	$I_{CB0}$	$V_{CB} = 10\text{V}, I_E = 0$			1.0	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 1\text{V}, I_C = 0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$	60*		270*	
Gain-Bandwidth Product	$f_T$	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$		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

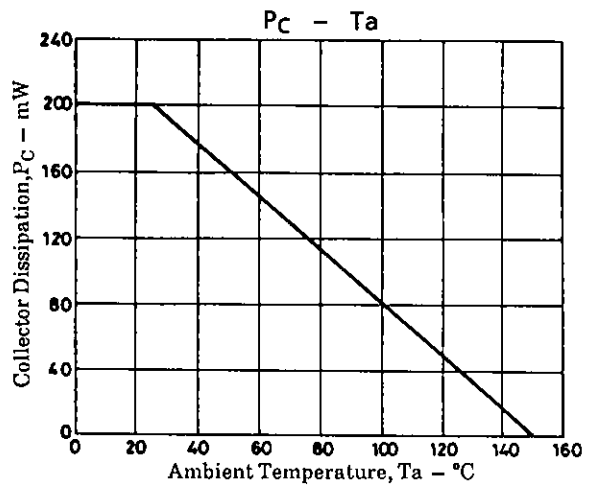
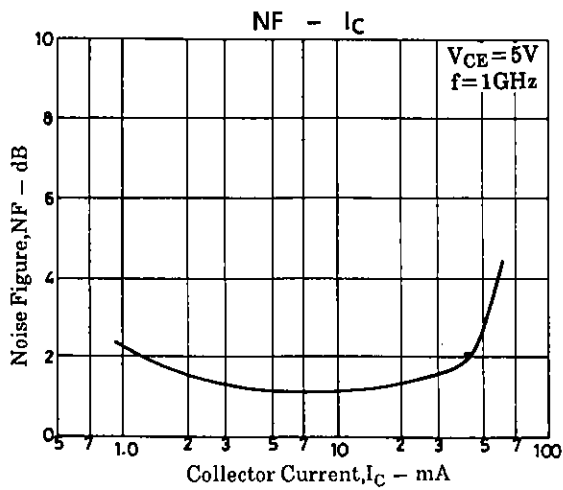
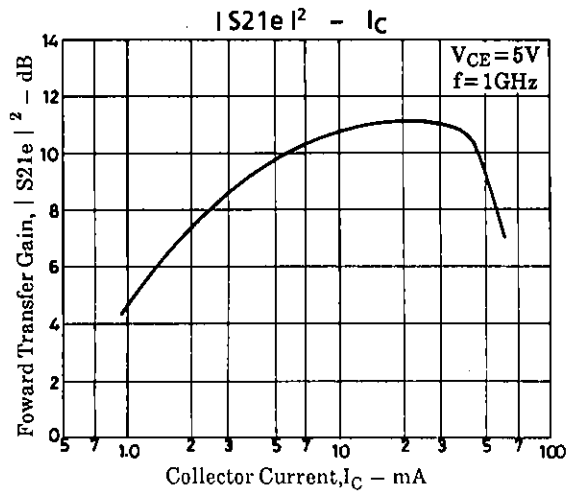
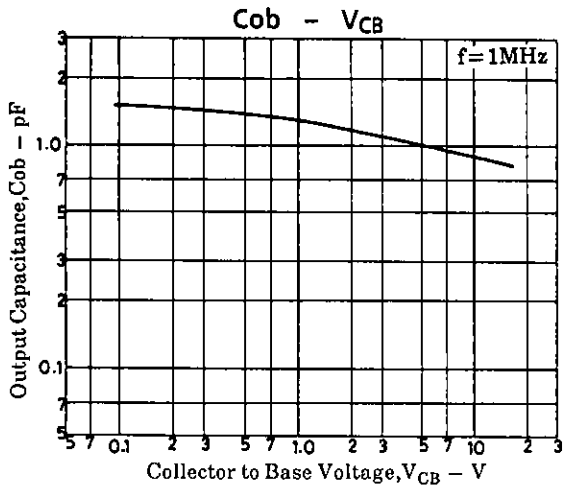
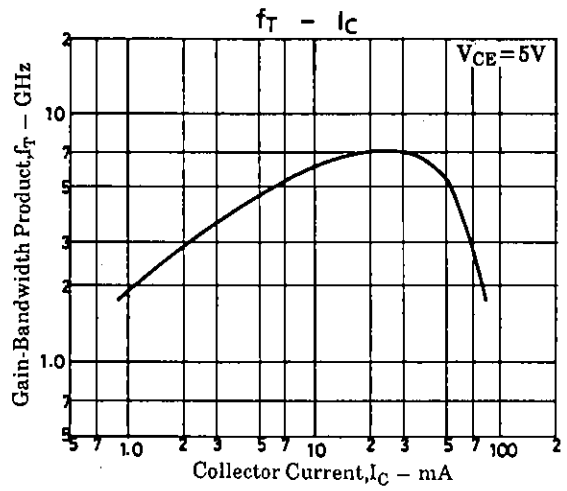
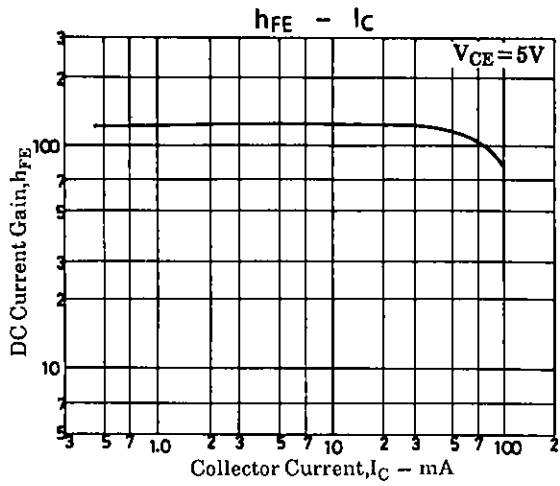
\* The 2SC4864 is classified by 20mA  $h_{FE}$  as follows :

60 3 120	90 4 180	135 5 270
----------	----------	-----------

Marking : FN  
 $h_{FE}$  rank : 3,4,5

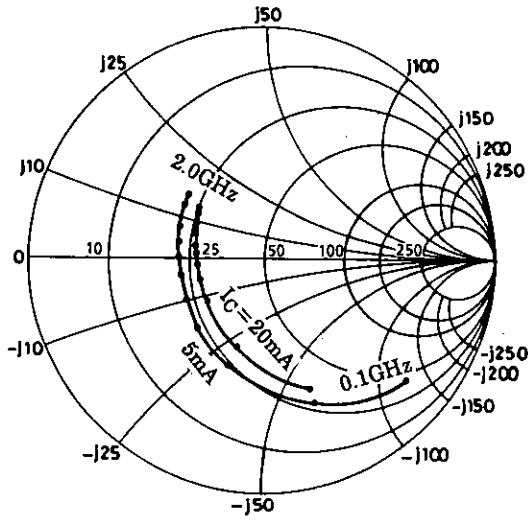
**Package Dimensions 2018B**  
 (unit : mm)



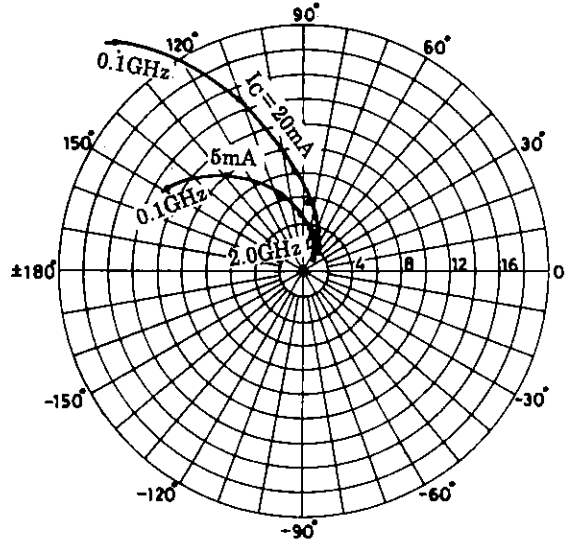


S Parameter

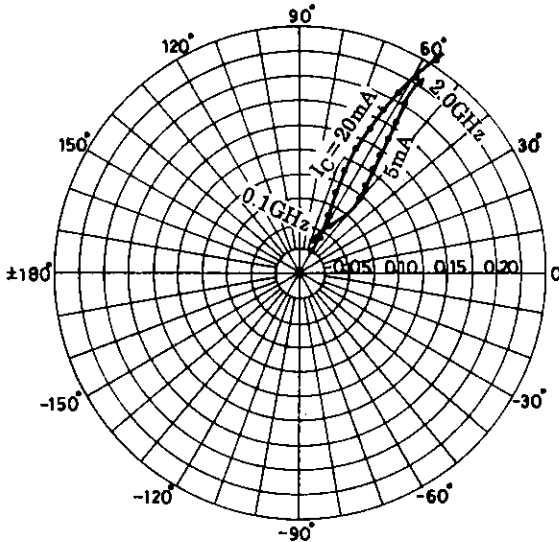
S11e:  $V_{CE} = 5V$   
 $f = 100MHz, 200 \sim 2000MHz$  (200MHz step)



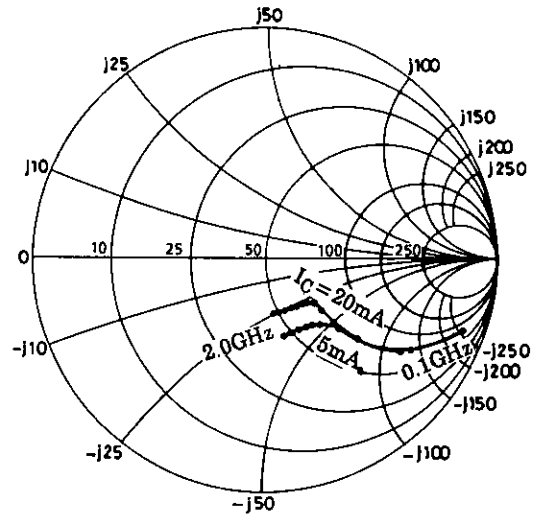
S21e:  $V_{CE} = 5V$   
 $f = 100MHz, 200 \sim 2000MHz$  (200MHz step)



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

■ No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.

■ Anyone purchasing any products described or contained herein for an above-mentioned use shall:

- ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use;
- ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.

■ Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.