

<b>SANYO</b>	No.4856	<b>2SC4867</b>
		NPN Epitaxial Planar Silicon Transistor VHF to UHF Wide-Band Low-Noise Amp Applications

**Features**

- Low noise :  $NF = 1.2\text{dB typ (} f = 1\text{GHz)}$ .
- High gain :  $|S_{21e}|^2 = 13\text{dB typ (} f = 1\text{GHz)}$ .
- High cutoff frequency :  $f_T = 9.0\text{GHz typ}$ .

**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	$V_{EBO}$	1.5	V
Collector Current	$I_C$	50	mA
Collector Dissipation	$P_C$	150	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

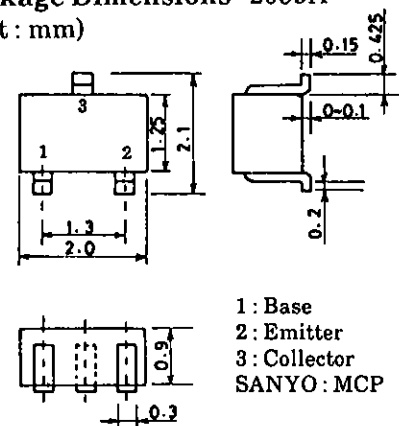
			min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 10\text{V}, I_E = 0$			1.0	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 1\text{V}, I_C = 0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 15\text{mA}$	60*		270*	
Gain-Bandwidth Product	$f_T$	$V_{CE} = 5\text{V}, I_C = 15\text{mA}$		9.0		GHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.6	1.1	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{V}, I_C = 15\text{mA}, f = 1\text{GHz}$	10	13		dB
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 5\text{mA}, f = 1\text{GHz}$		1.2	2.5	dB

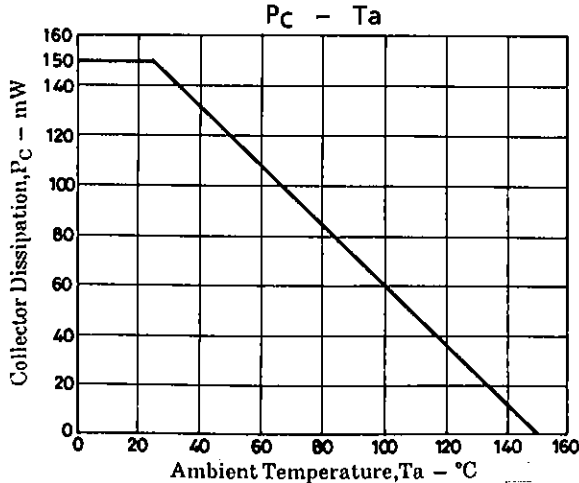
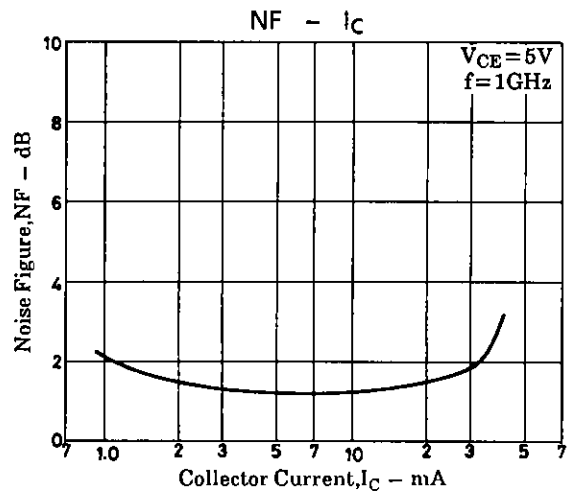
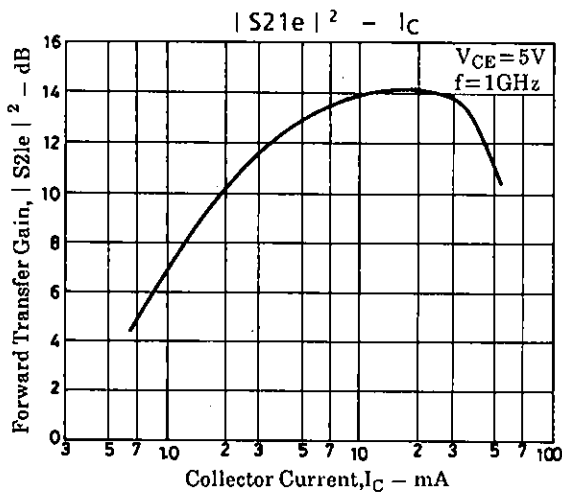
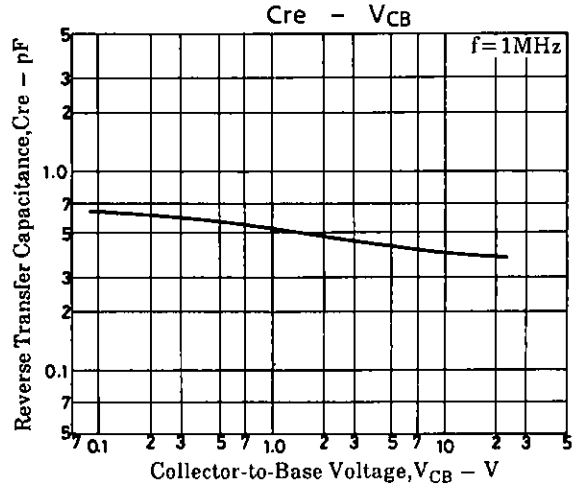
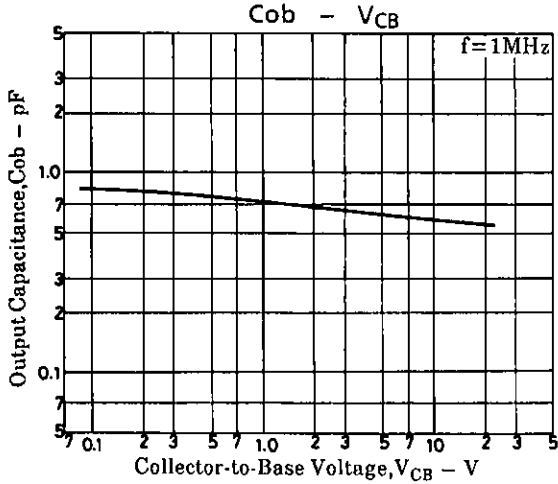
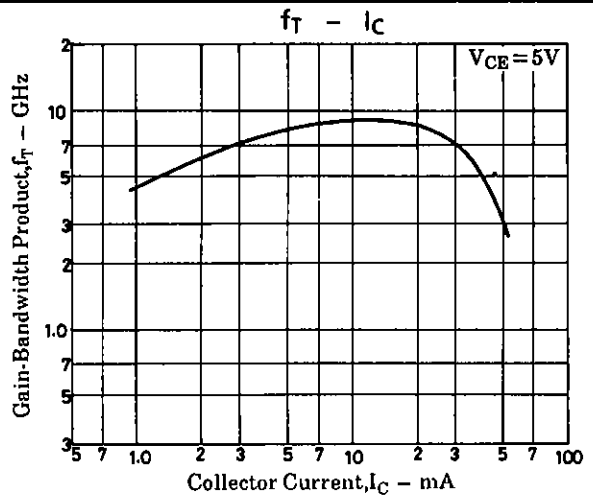
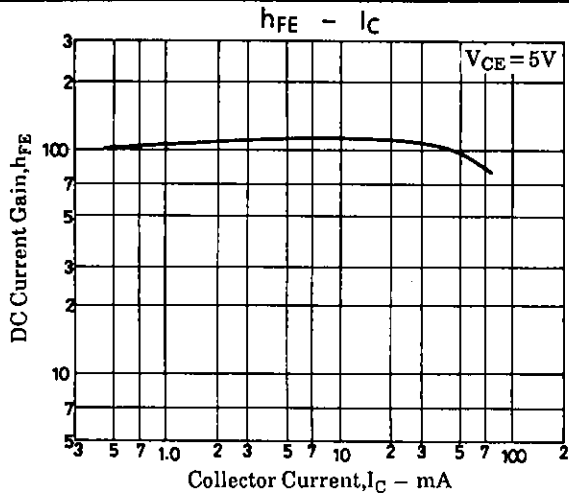
\* : The 2SC4867 is classified by 15mA  $h_{FE}$  as follows :

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

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

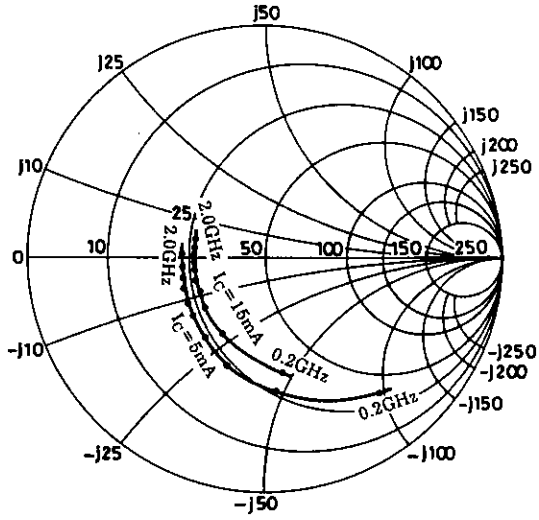
**Package Dimensions 2059A**  
(unit : mm)



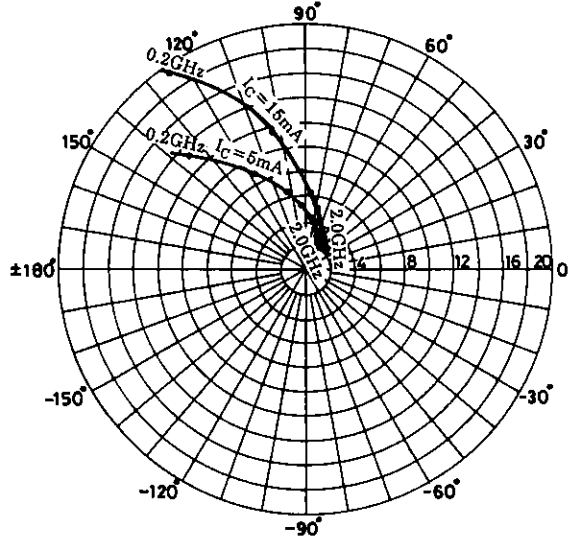


S Parameter

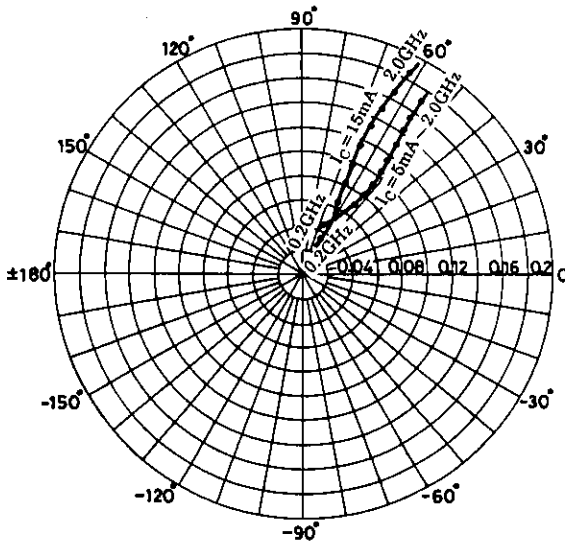
$V_{CE} = 5V$   
 $f = 200 \text{ to } 2000\text{MHz (200MHz Step)}$



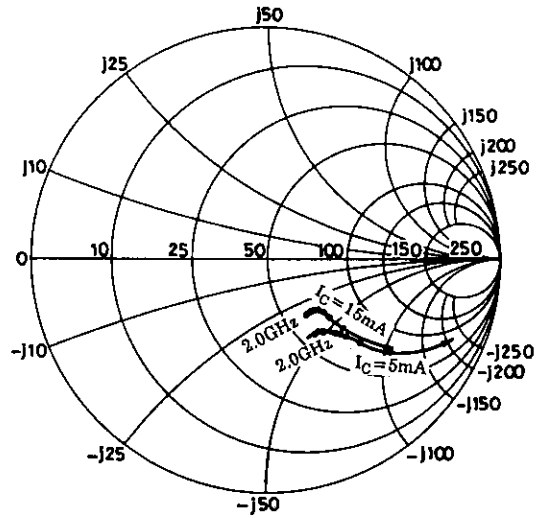
$V_{CE} = 5V$   
 $f = 200 \text{ to } 2000\text{MHz (200MHz Step)}$



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



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



## 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} $	$\angle S_{22}$
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

 $V_{CE}=5V, I_C=15mA, Z_0=50\Omega$ 

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.507	-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

■ 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.

This catalog provide information as of April, 1995. Specifications and information herein are subject to change without notice.