

**2SC4867**

VHF to UHF Wide-Band Low-Noise Amplifier Applications

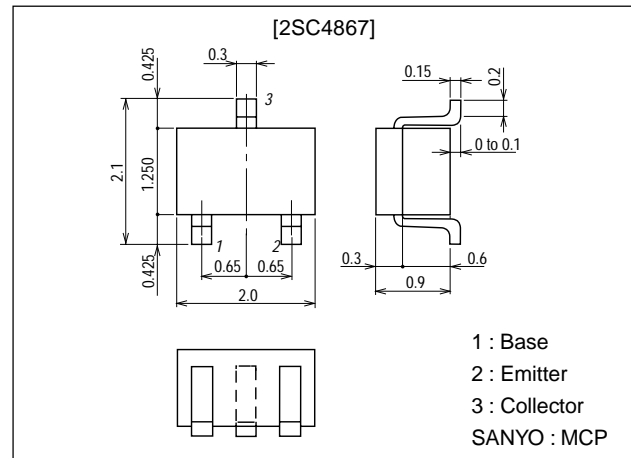
Features

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

Package Dimensions

unit:mm

2059B



Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage | V_{CB0} | | 16 | V |
| Collector-to-Emitter Voltage | V_{CE0} | | 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 $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------|---------------|--|---------|-----|------|---------------|
| | | | min | typ | max | |
| 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} | $V_{CE}=5\text{V}, I_C=15\text{mA}$ | 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

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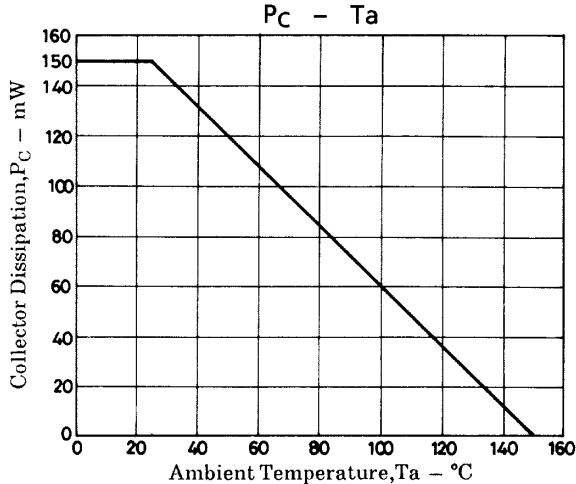
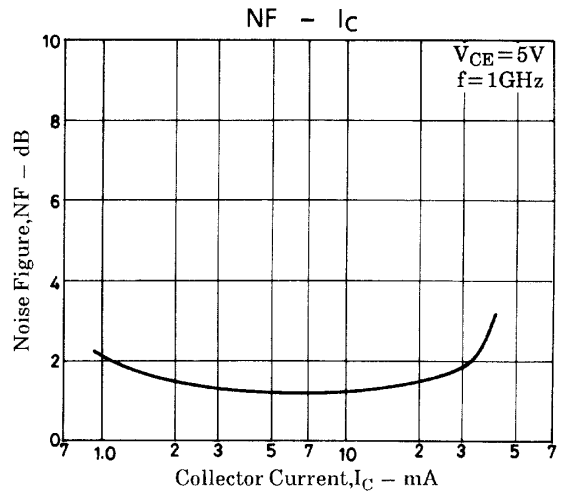
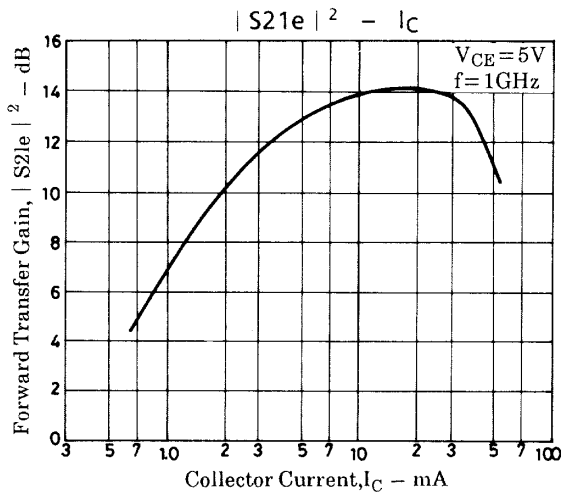
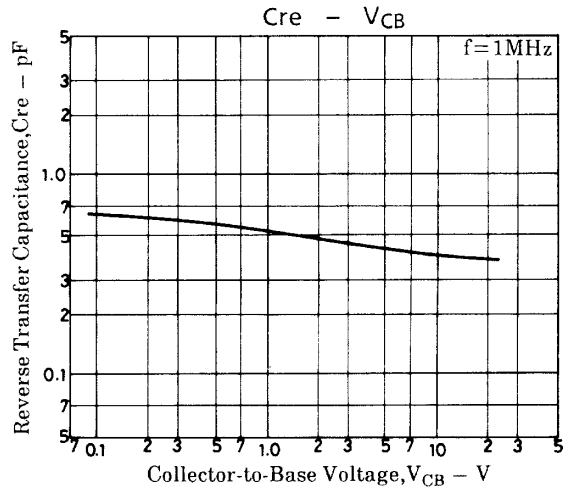
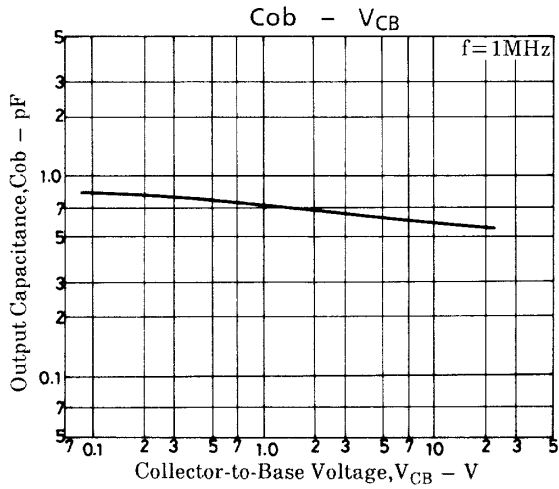
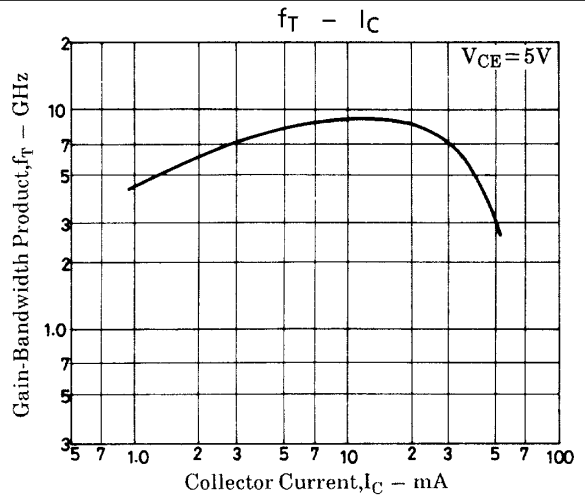
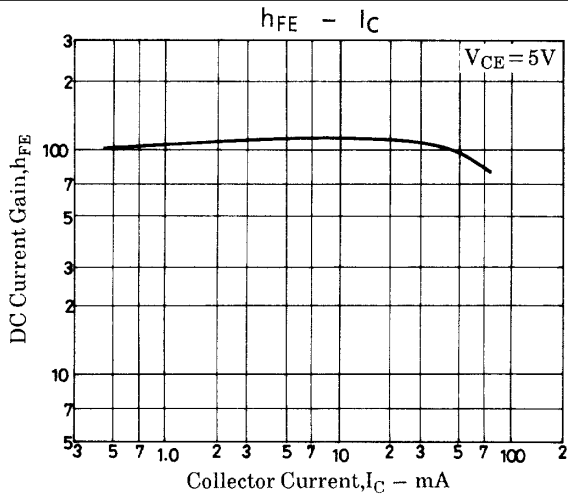
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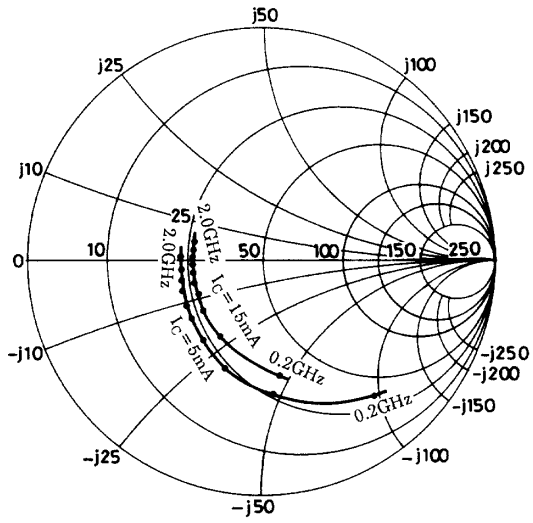
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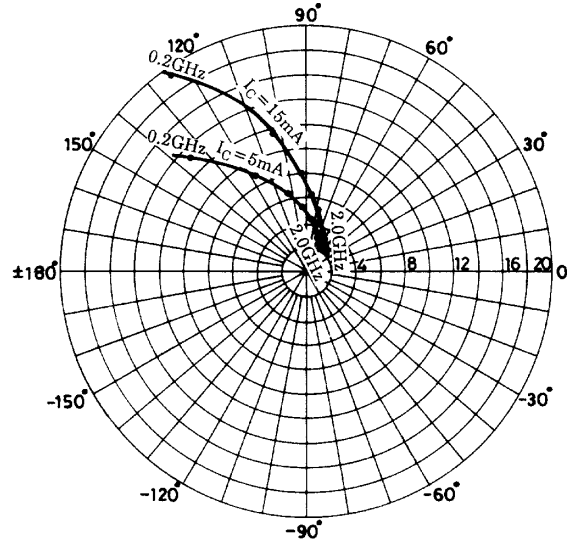
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S parameter

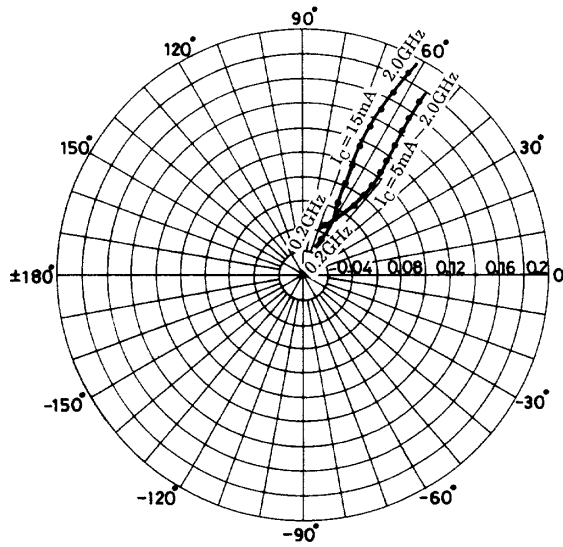
$V_{CE} = 5V$
 $f = 200 \text{ to } 2000\text{MHz (200MHz Step)}$



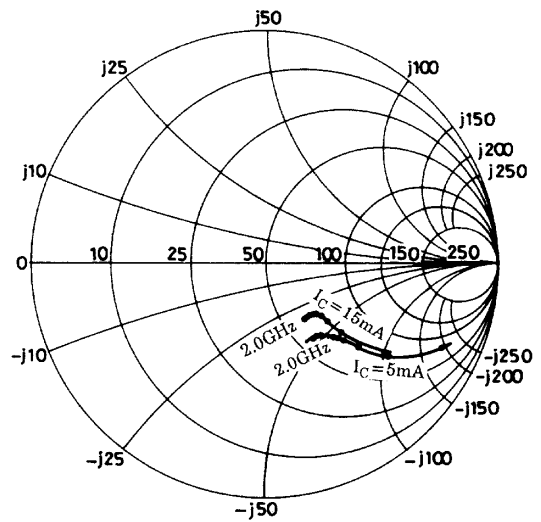
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$V_{CE} = 5V$
 $f = 200 \text{ to } 2000\text{MHz (200MHz Step)}$



S parameter (Common emitter)

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

| 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 |

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

| 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 |

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