

**2SC5374**

VHF to UHF Band OSC, High-Frequency Amplifiers Applications

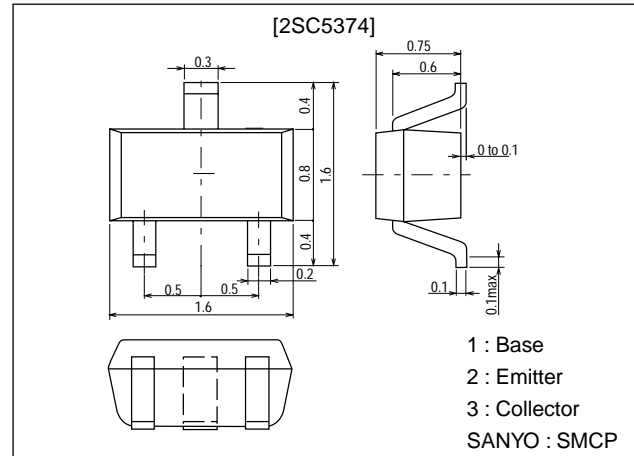
Features

- High gain : $|S_{21e}|^2=10.5\text{dB typ (f=1GHz)}$.
- High cutoff frequency : $f_T=5.2\text{GHz typ}$.

Package Dimensions

unit:mm

2106A



Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage | V_{CBO} | | 20 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | 10 | V |
| Emitter-to-Base Voltage | V_{EBO} | | 2 | V |
| Collector Current | I_C | | 100 | mA |
| Collector Dissipation | P_C | | 100 | 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_{CBO} | $V_{CB}=10\text{V}, I_E=0$ | | | 1.0 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=1\text{V}, I_C=0$ | | | 10 | μA |
| DC Current Gain | h_{FE1} | $V_{CE}=3\text{V}, I_C=7\text{mA}$ | 110 | | 180 | |
| | h_{FE2} | $V_{CE}=3\text{V}, I_C=30\text{mA}$ | 100 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE}=3\text{V}, I_C=7\text{mA}$ | 3 | 5.2 | | GHz |
| Output Capacitance | C_{ob} | $V_{CB}=3\text{V}, f=1\text{MHz}$ | | 1.0 | 1.5 | pF |
| Reverse Transfer Capacitance | C_{re} | $V_{CB}=3\text{V}, f=1\text{MHz}$ | | 0.7 | | pF |
| Forward Transfer Gain | $ S_{21e} ^2$ | $V_{CE}=3\text{V}, I_C=7\text{mA}, f=1\text{GHz}$ | 8 | 10.5 | | dB |
| Noise Figure | NF | $V_{CE}=3\text{V}, I_C=7\text{mA}, f=1\text{GHz}$ | | 1.4 | 2.5 | dB |

Marking : NA

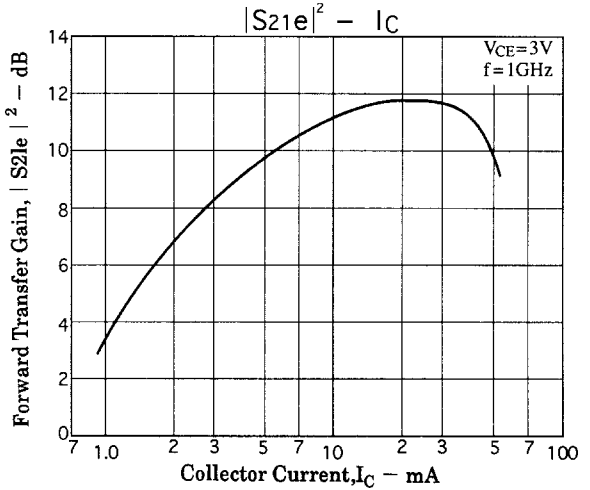
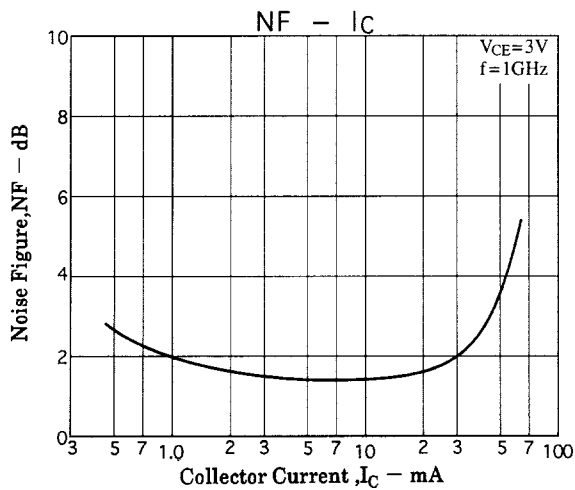
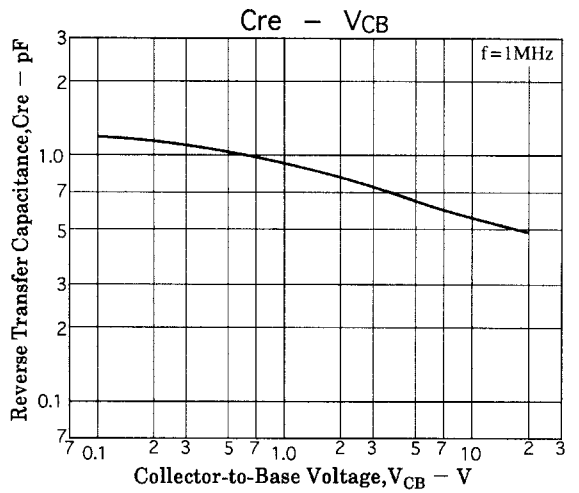
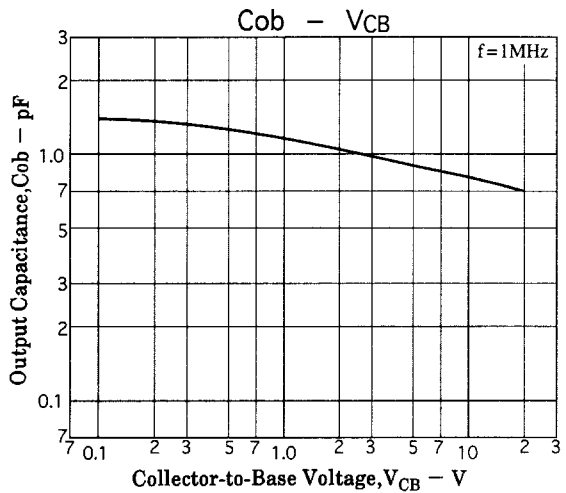
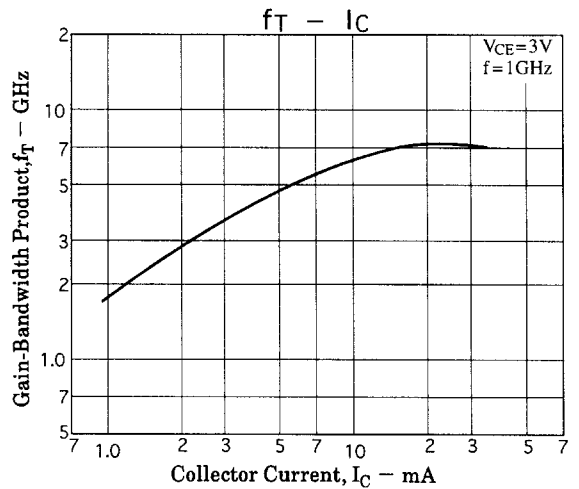
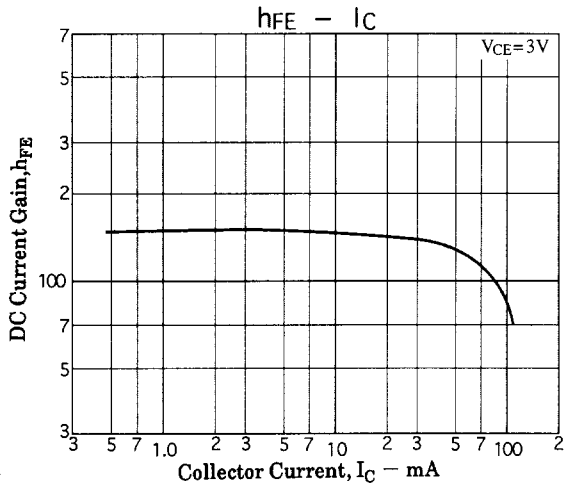
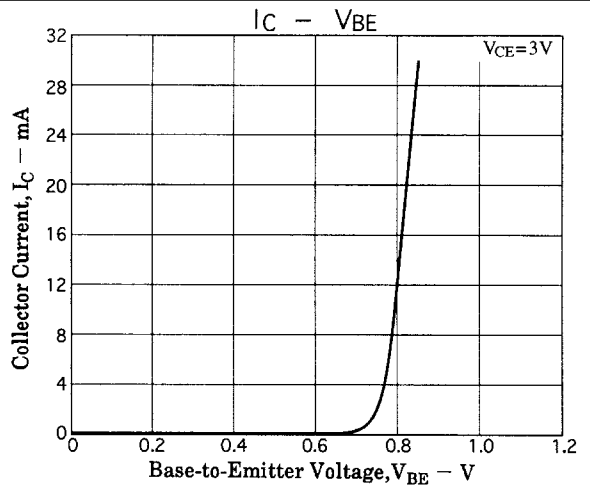
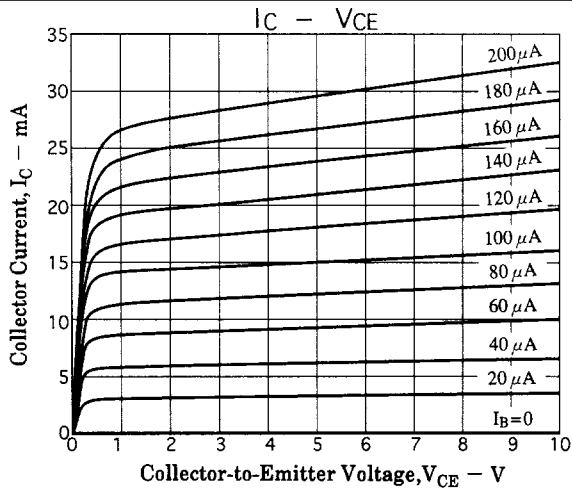
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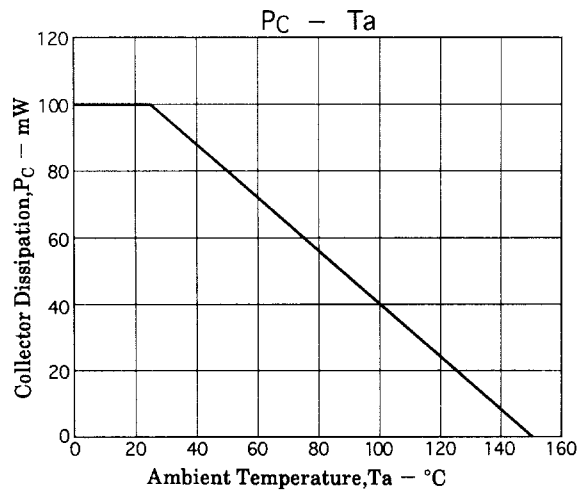
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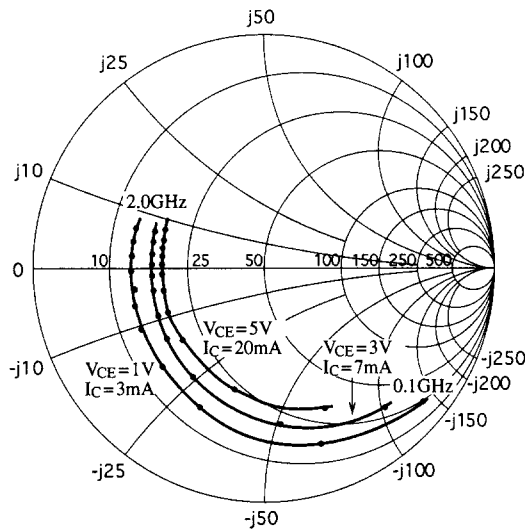




S Parameters

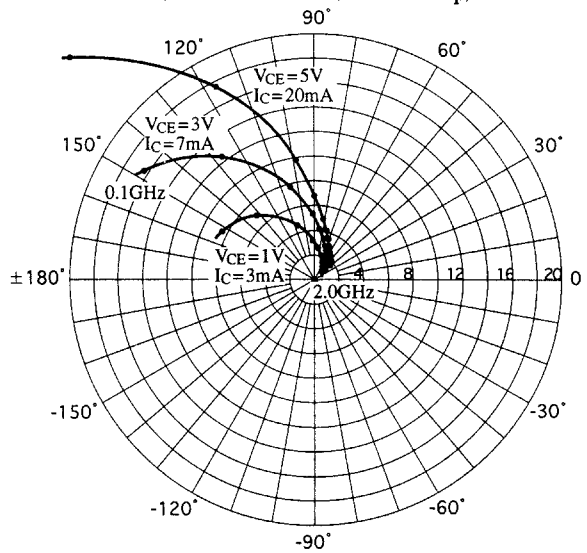
S11e

f = 100MHz, 200 to 2000MHz (200MHz step)



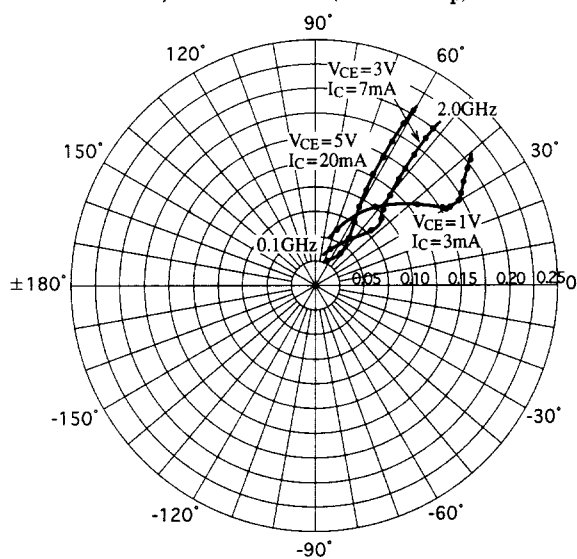
S21e

f = 100MHz, 200 to 2000MHz (200MHz step)



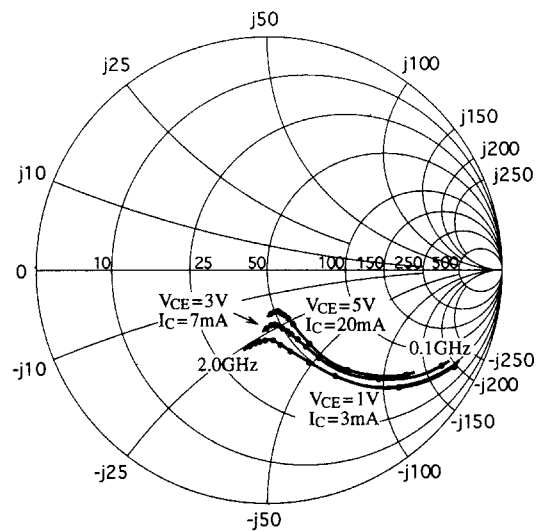
S12e

f = 100MHz, 200 to 2000MHz (200MHz step)



S22e

f = 100MHz, 200 to 2000MHz (200MHz step)



2SC5374

S parameters (Common emitter)

$V_{CE}=1V, I_C=3mA, Z_O=50\Omega$

| Freq (MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100 | 0.874 | -40.6 | 8.627 | 152.3 | 0.062 | 67.9 | 0.918 | -23.4 |
| 200 | 0.785 | -71.6 | 6.874 | 132.5 | 0.101 | 52.1 | 0.748 | -41.7 |
| 400 | 0.651 | -114.8 | 4.701 | 107.3 | 0.135 | 37.1 | 0.537 | -57.6 |
| 600 | 0.613 | -136.9 | 3.365 | 92.8 | 0.152 | 31.1 | 0.430 | -65.6 |
| 800 | 0.581 | -153.9 | 2.716 | 81.9 | 0.155 | 29.9 | 0.361 | -74.3 |
| 1000 | 0.568 | -164.2 | 2.218 | 73.4 | 0.161 | 30.0 | 0.326 | -80.2 |
| 1200 | 0.556 | -172.0 | 1.863 | 66.2 | 0.170 | 30.5 | 0.300 | -86.1 |
| 1400 | 0.563 | -178.1 | 1.626 | 59.6 | 0.177 | 32.7 | 0.297 | -92.3 |
| 1600 | 0.558 | 175.4 | 1.473 | 53.9 | 0.185 | 35.4 | 0.306 | -96.5 |
| 1800 | 0.560 | 168.9 | 1.345 | 48.1 | 0.196 | 37.4 | 0.313 | -100.6 |
| 2000 | 0.567 | 163.1 | 1.230 | 42.5 | 0.205 | 38.0 | 0.335 | -102.9 |

$V_{CE}=3V, I_C=7mA, Z_O=50\Omega$

| Freq (MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100 | 0.789 | -48.3 | 16.232 | 147.7 | 0.039 | 66.1 | 0.862 | -27.2 |
| 200 | 0.670 | -83.7 | 12.431 | 126.4 | 0.061 | 53.0 | 0.673 | -44.6 |
| 400 | 0.552 | -123.8 | 7.607 | 104.7 | 0.081 | 45.2 | 0.438 | -59.1 |
| 600 | 0.522 | -145.3 | 5.401 | 92.7 | 0.094 | 45.9 | 0.333 | -65.1 |
| 800 | 0.504 | -158.5 | 4.155 | 84.1 | 0.106 | 48.2 | 0.290 | -68.7 |
| 1000 | 0.488 | -169.1 | 3.425 | 77.1 | 0.121 | 49.1 | 0.270 | -71.0 |
| 1200 | 0.478 | -176.1 | 2.849 | 71.0 | 0.136 | 51.0 | 0.253 | -74.7 |
| 1400 | 0.481 | 178.4 | 2.511 | 65.6 | 0.152 | 52.2 | 0.239 | -79.6 |
| 1600 | 0.478 | 172.7 | 2.237 | 60.7 | 0.167 | 52.8 | 0.240 | -82.8 |
| 1800 | 0.492 | 167.4 | 2.016 | 55.5 | 0.185 | 53.2 | 0.245 | -86.7 |
| 2000 | 0.489 | 162.0 | 1.844 | 50.5 | 0.200 | 52.7 | 0.248 | -90.0 |

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

| Freq (MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100 | 0.643 | -66.4 | 26.381 | 137.4 | 0.029 | 62.8 | 0.748 | -36.3 |
| 200 | 0.530 | -104.6 | 17.543 | 116.5 | 0.041 | 54.2 | 0.531 | -52.5 |
| 400 | 0.459 | -140.3 | 9.835 | 98.9 | 0.058 | 55.4 | 0.322 | -62.7 |
| 600 | 0.447 | -157.2 | 6.805 | 89.4 | 0.074 | 59.2 | 0.246 | -65.5 |
| 800 | 0.440 | -168.4 | 5.210 | 82.4 | 0.092 | 61.4 | 0.213 | -68.6 |
| 1000 | 0.434 | -175.9 | 4.194 | 76.6 | 0.110 | 61.9 | 0.199 | -70.2 |
| 1200 | 0.437 | 177.1 | 3.518 | 71.5 | 0.129 | 62.3 | 0.191 | -72.9 |
| 1400 | 0.437 | 173.0 | 3.077 | 66.7 | 0.148 | 61.8 | 0.184 | -76.5 |
| 1600 | 0.438 | 168.4 | 2.730 | 62.5 | 0.166 | 61.6 | 0.181 | -80.9 |
| 1800 | 0.439 | 164.2 | 2.459 | 58.0 | 0.186 | 60.7 | 0.186 | -84.8 |
| 2000 | 0.444 | 159.1 | 2.249 | 53.5 | 0.203 | 59.5 | 0.192 | -87.3 |

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