

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC5084

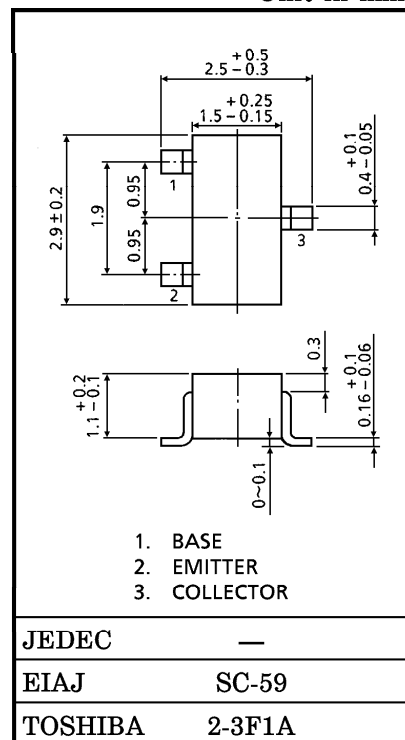
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

Unit in mm

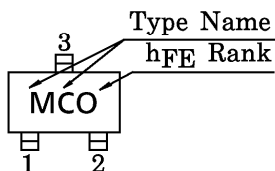
- Low Noise Figure, High Gain.
- $NF=1.1dB, |S_{21e}|^2=11dB (f=1GHz)$

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|------------------|---------|------|
| Collector-Base Voltage | V _{CBO} | 20 | V |
| Collector-Emitter Voltage | V _{CEO} | 12 | V |
| Emitter-Base Voltage | V _{EBO} | 3 | V |
| Base Current | I _B | 40 | mA |
| Collector Current | I _C | 80 | mA |
| Collector Power Dissipation | P _C | 150 | mW |
| Junction Temperature | T _j | 125 | °C |
| Storage Temperature Range | T _{stg} | -55~125 | °C |



MARKING



MICROWAVE CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------|-------------------------------------|--|------|------|------|------|
| Transition Frequency | f _T | V _{CE} = 10V, I _C = 20mA | 5 | 7 | — | GHz |
| Insertion Gain | S _{21e} ² (1) | V _{CE} = 10V, I _C = 20mA, f = 500MHz | — | 16.5 | — | dB |
| | S _{21e} ² (2) | V _{CE} = 10V, I _C = 20mA, f = 1GHz | 7.5 | 11 | — | |
| Noise Figure | NF (1) | V _{CE} = 10V, I _C = 5mA, f = 500MHz | — | 1 | — | dB |
| | NF (2) | V _{CE} = 10V, I _C = 5mA, f = 1GHz | — | 1.1 | 2 | |

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

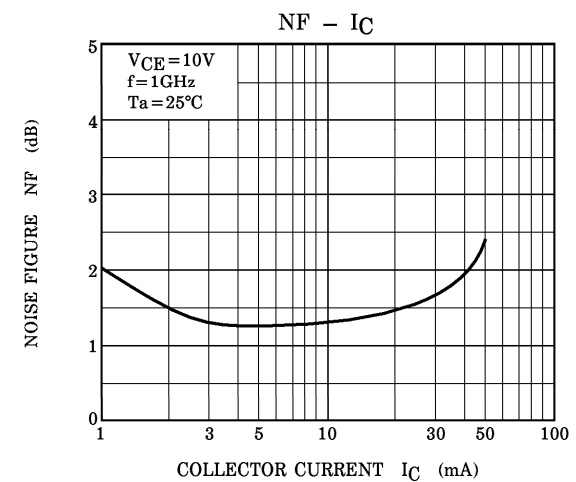
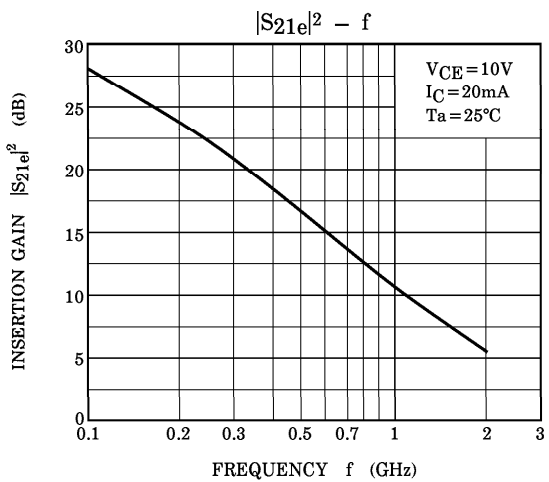
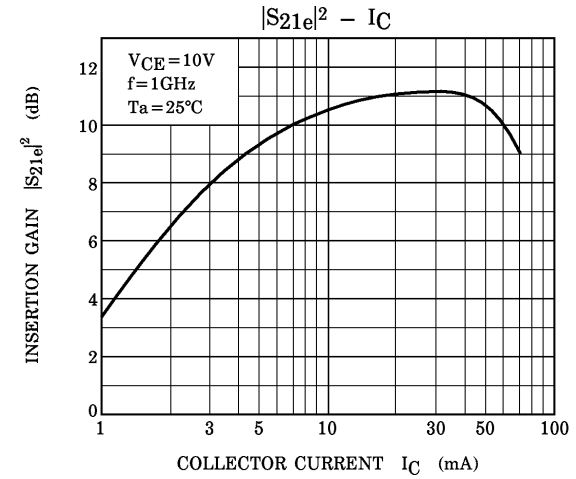
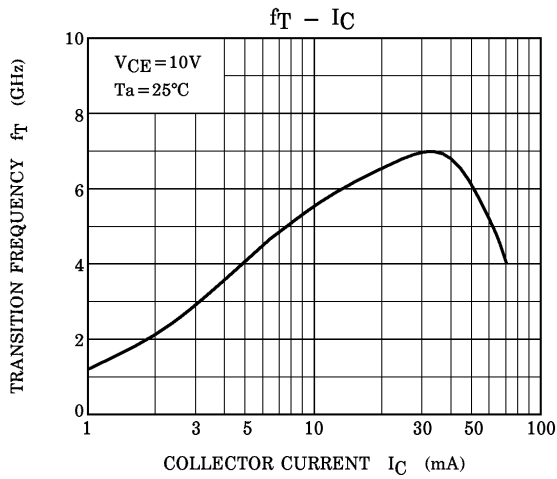
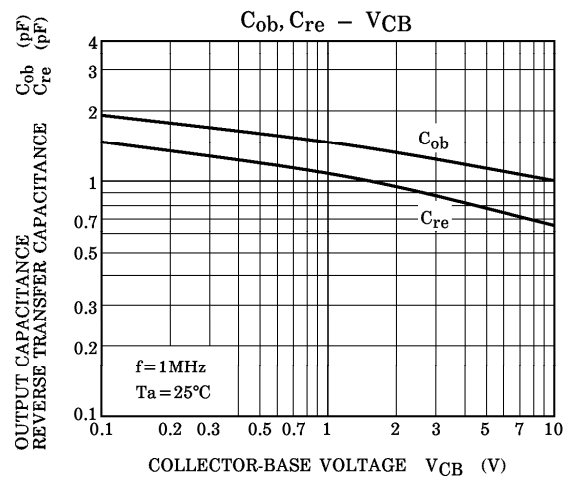
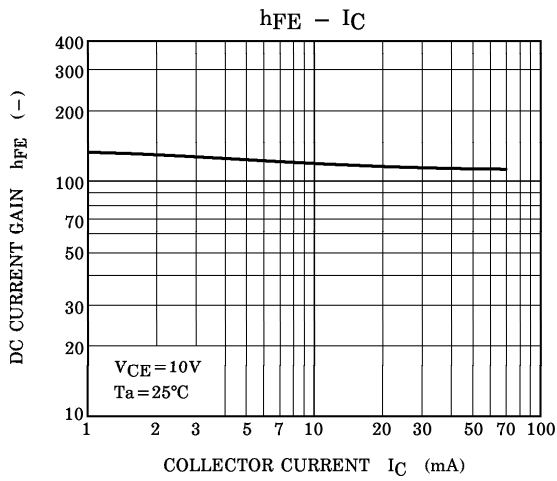
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|------------------------------|--------------------------|---|----------|------|------|------|
| Collector Cut-off Current | I _{CBO} | V _{CB} = 10V, I _E = 0 | — | — | 1 | μA |
| Emitter Cut-off Current | I _{EBO} | V _{EB} = 1V, I _C = 0 | — | — | 1 | μA |
| DC Current Gain | h _{FE} (Note 1) | V _{CE} = 10V, I _C = 20mA | 80 | — | 240 | — |
| Output Capacitance | C _{ob} | V _{CB} = 10V, I _E = 0, f = 1MHz | — | 1.0 | — | pF |
| Reverse Transfer Capacitance | C _{re} | | (Note 2) | — | 0.65 | 1.15 |

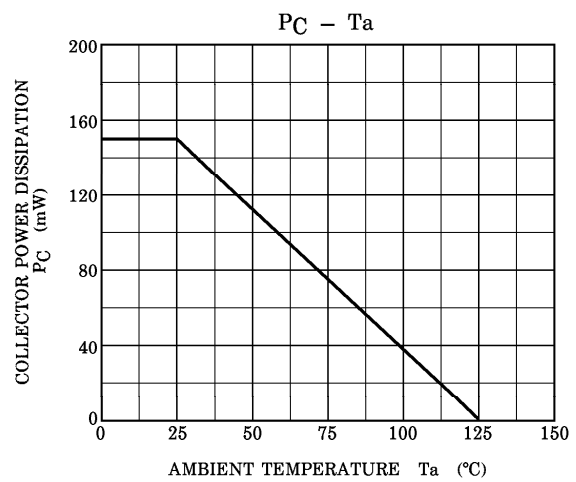
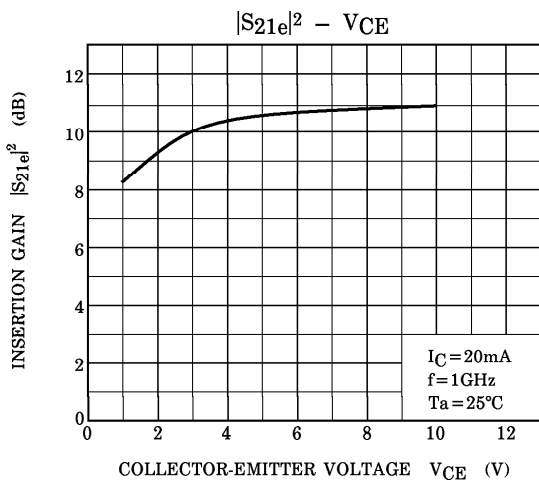
(Note 1) h_{FE} Classification O : 80~160, Y : 120~240

(Note 2) C_{re} is measured by 3 terminal method with capacitance bridge.

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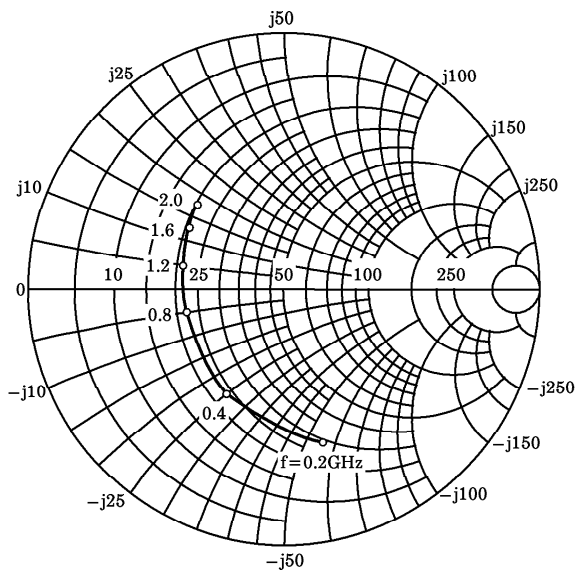
S-Parameter Z₀ = 50Ω, T_a = 25°C
 V_{CE} = 10V, I_C = 5mA

| frequency (MHz) | S11 | | S21 | | S12 | | S22 | |
|-----------------|-------|--------|-------|-------|-------|------|-------|-------|
| | Mag. | Ang. | Mag. | Ang. | Mag. | Ang. | Mag. | Ang. |
| 200 | 0.628 | -77.1 | 9.254 | 126.5 | 0.051 | 53.3 | 0.695 | -31.0 |
| 400 | 0.471 | -122.1 | 6.027 | 103.3 | 0.067 | 48.4 | 0.509 | -34.9 |
| 600 | 0.417 | -149.1 | 4.341 | 90.3 | 0.077 | 51.9 | 0.441 | -35.2 |
| 800 | 0.404 | -167.3 | 3.381 | 81.2 | 0.090 | 56.9 | 0.412 | -36.0 |
| 1000 | 0.402 | 178.1 | 2.798 | 73.3 | 0.104 | 62.0 | 0.398 | -37.7 |
| 1200 | 0.412 | 166.6 | 2.393 | 66.7 | 0.122 | 66.4 | 0.390 | -40.3 |
| 1400 | 0.427 | 156.6 | 2.108 | 60.4 | 0.145 | 69.1 | 0.385 | -44.3 |
| 1600 | 0.440 | 147.3 | 1.881 | 54.8 | 0.170 | 69.8 | 0.376 | -48.8 |
| 1800 | 0.455 | 140.0 | 1.713 | 49.4 | 0.194 | 70.2 | 0.373 | -54.3 |
| 2000 | 0.482 | 132.6 | 1.586 | 44.6 | 0.223 | 71.3 | 0.367 | -60.0 |

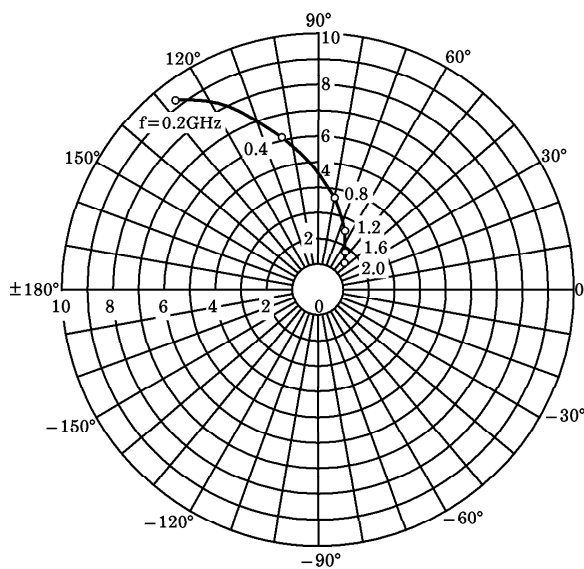
V_{CE} = 10V, I_C = 20mA

| frequency (MHz) | S11 | | S21 | | S12 | | S22 | |
|-----------------|-------|--------|--------|-------|-------|------|-------|-------|
| | Mag. | Ang. | Mag. | Ang. | Mag. | Ang. | Mag. | Ang. |
| 200 | 0.340 | -122.7 | 15.443 | 107.4 | 0.034 | 62.7 | 0.415 | -40.5 |
| 400 | 0.299 | -158.7 | 8.266 | 92.4 | 0.056 | 69.3 | 0.293 | -34.2 |
| 600 | 0.293 | -178.0 | 5.664 | 84.0 | 0.080 | 71.7 | 0.265 | -30.4 |
| 800 | 0.294 | 169.0 | 4.334 | 77.3 | 0.104 | 72.1 | 0.255 | -29.9 |
| 1000 | 0.299 | 157.9 | 3.528 | 71.2 | 0.129 | 72.0 | 0.252 | -30.6 |
| 1200 | 0.310 | 149.5 | 3.002 | 66.0 | 0.155 | 71.4 | 0.254 | -32.5 |
| 1400 | 0.321 | 142.0 | 2.629 | 61.0 | 0.183 | 69.7 | 0.255 | -36.1 |
| 1600 | 0.332 | 134.9 | 2.336 | 56.3 | 0.209 | 67.6 | 0.248 | -40.6 |
| 1800 | 0.341 | 129.5 | 2.121 | 51.7 | 0.234 | 65.6 | 0.242 | -45.9 |
| 2000 | 0.366 | 124.3 | 1.958 | 47.3 | 0.260 | 64.6 | 0.236 | -51.7 |

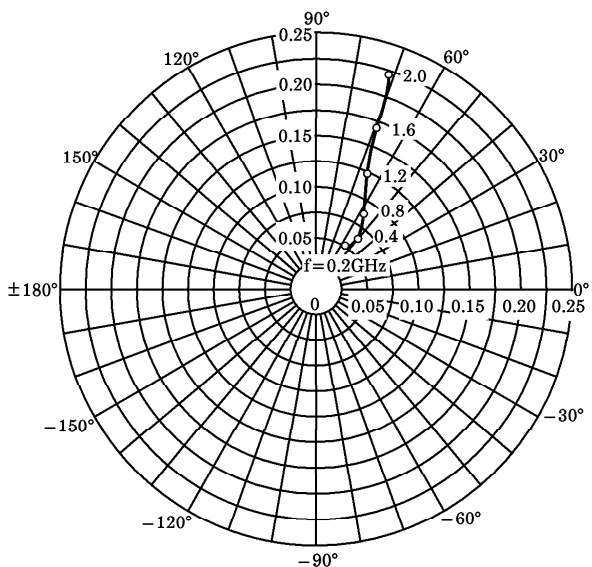
S_{11e}
 V_{CE}=10V
 I_C=5mA
 T_a=25°C
 (UNIT : Ω)



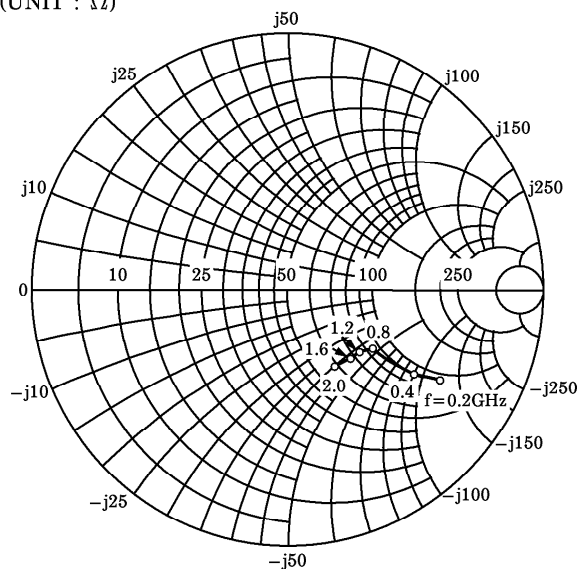
S_{21e}
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 I_C=5mA
 T_a=25°C



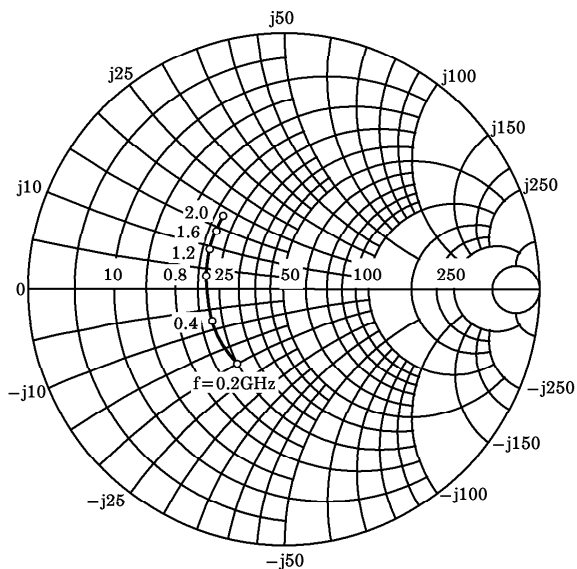
S_{12e}
 V_{CE}=10V
 I_C=5mA
 T_a=25°C



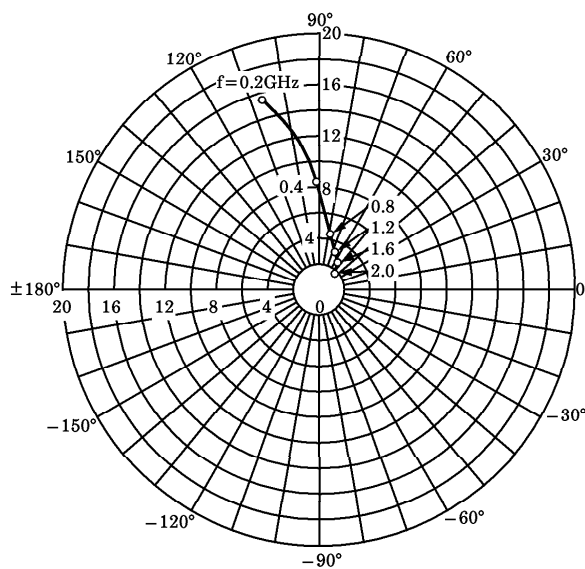
S_{22e}
 V_{CE}=10V
 I_C=5mA
 T_a=25°C
 (UNIT : Ω)



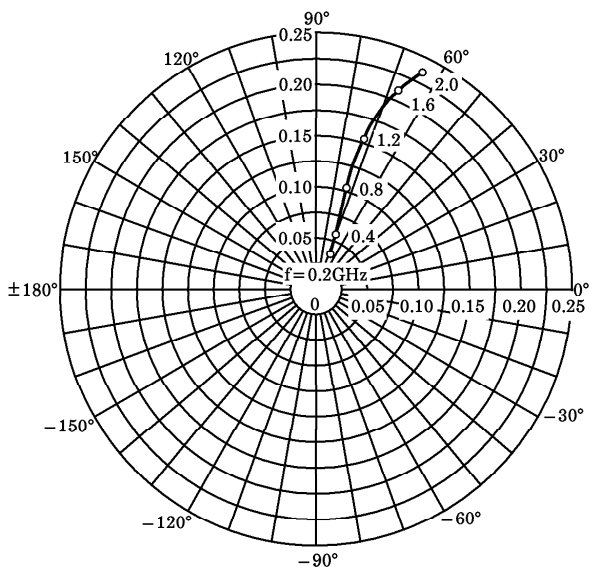
S_{11e}
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S_{21e}
 V_{CE} = 10V
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S_{12e}
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