

**2SC3779**

## UHF Low-Noise Amplifier, Wide-Band Amplifier Applications

### Applications

- UHF low-noise amplifiers, wide-band amplifiers.

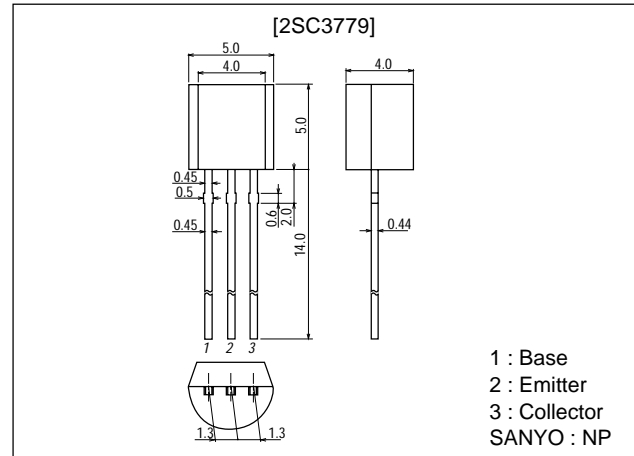
### Features

- Small noise figure : NF=1.5dB typ (f=0.9GHz).
- High power gain : MAG=14dB typ (f=0.9GHz).
- High cutoff frequency :  $f_T=5\text{GHz}$  typ.

### Package Dimensions

unit:mm

2004B



### Specifications

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

| Parameter                    | Symbol    | Conditions | Ratings     | Unit             |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CB0}$ |            | 20          | V                |
| Collector-to-Emitter Voltage | $V_{CE0}$ |            | 12          | V                |
| Emitter-to-Base Voltage      | $V_{EB0}$ |            | 3           | V                |
| Collector Current            | $I_C$     |            | 100         | mA               |
| Base Current                 | $I_B$     |            | 40          | mA               |
| Collector Dissipation        | $P_C$     |            | 600         | 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     | $I_{CB0}$ | $V_{CB}=12\text{V}, I_E=0$           |         |     | 1.0  | $\mu\text{A}$ |
| Emitter Cutoff Current       | $I_{EB0}$ | $V_{EB}=2\text{V}, I_C=0$            |         |     | 10   | $\mu\text{A}$ |
| DC Current Gain              | $h_{FE}$  | $V_{CE}=10\text{V}, I_C=20\text{mA}$ | 40*     |     | 200* |               |
| Gain-Bandwidth Product       | $f_T$     | $V_{CE}=10\text{V}, I_C=20\text{mA}$ |         | 5.0 |      | GHz           |
| Output Capacitance           | $C_{ob}$  | $V_{CB}=10\text{V}, f=1\text{MHz}$   |         | 1.0 |      | pF            |
| Reverse Transfer Capacitance | $C_{re}$  | $V_{CB}=10\text{V}, f=1\text{MHz}$   |         | 0.7 |      | pF            |

\* : The 2SC3779 is classified by 20mA  $h_{FE}$  as follows :

Continued on next page.

| Rank     | C        | D         | E          |
|----------|----------|-----------|------------|
| $h_{FE}$ | 40 to 80 | 60 to 120 | 100 to 200 |

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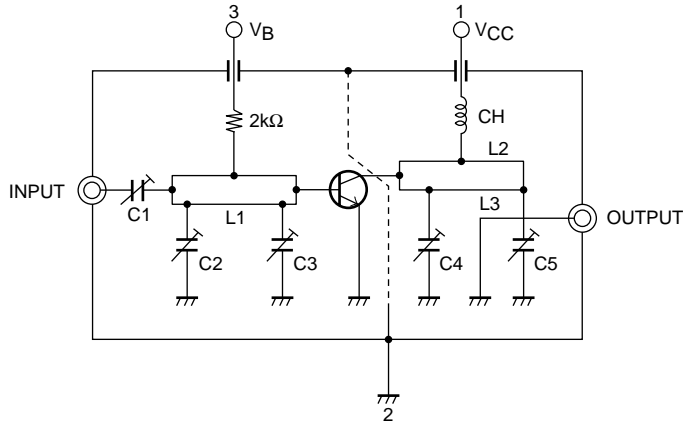
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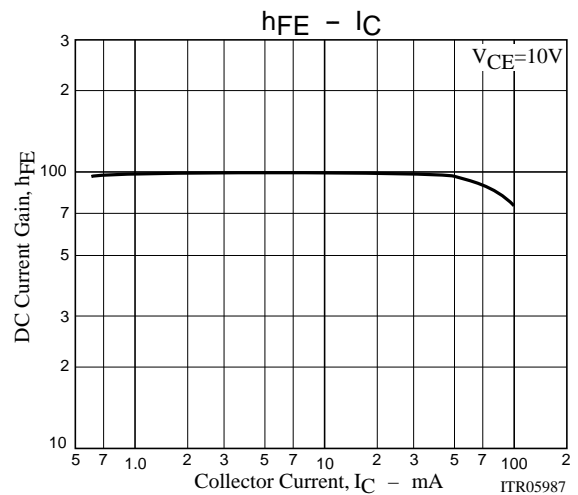
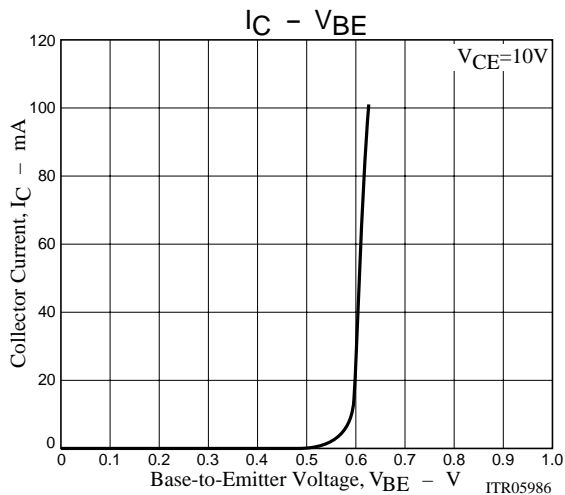
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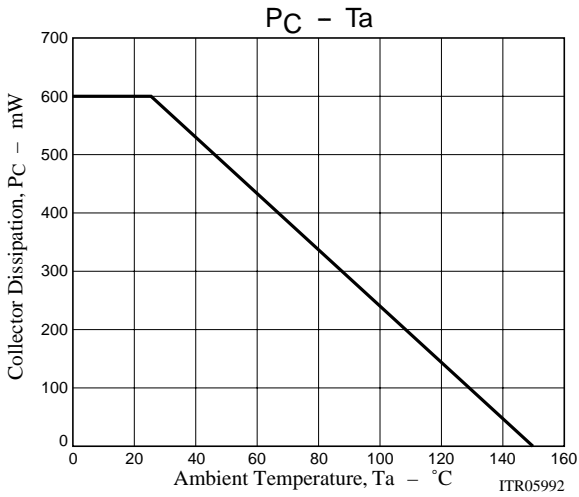
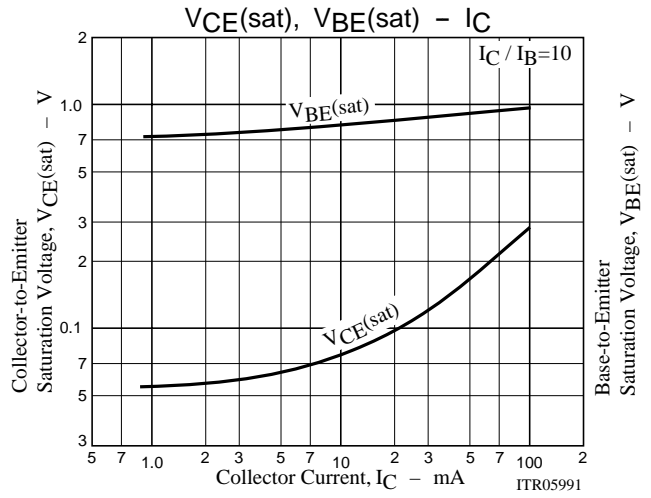
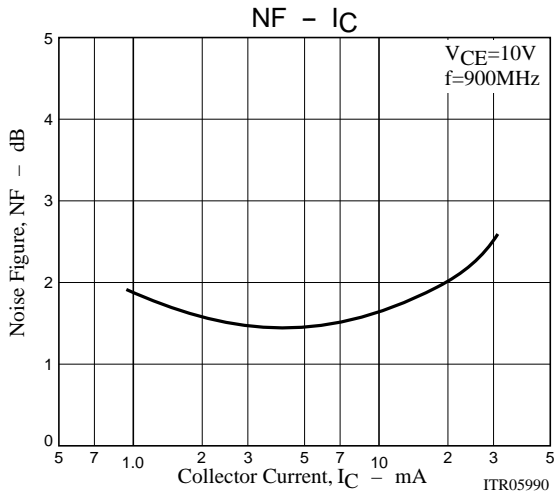
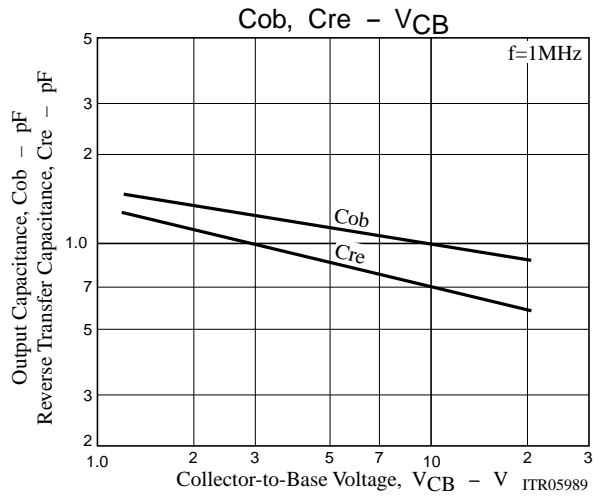
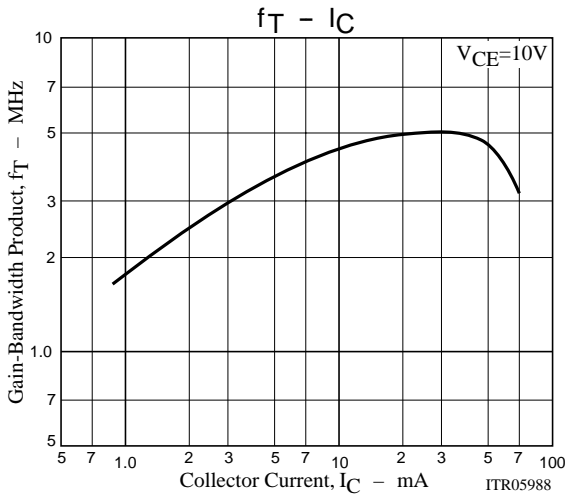
| Parameter                    | Symbol        | Conditions   | Ratings |     |     | Unit |
|------------------------------|---------------|--|---------|-----|-----|------|
|                              |               |  | min     | typ | max |      |
| Forward Transfer Gain        | $ S_{21e} ^2$ | $V_{CE}=10V, I_C=20mA, f=0.9GHz$                                 | 8.5     | 10  |     | dB   |
| Maximum Available Power Gain | MAG           | $V_{CE}=10V, I_C=20mA, f=0.9GHz$                                 |         | 14  |     | dB   |
| Noise Figure                 | NF            | $V_{CE}=10V, I_C=5mA, f=0.9GHz$ ,<br>See specified Test Circuit. |         | 1.5 | 3.0 | dB   |

## NF Test Circuit



| 900MHz |                                   |
|--------|-----------------------------------|
| C1     | ~5pF                              |
| C2     | ~10pF                             |
| C3     | ~10pF                             |
| C4     | ~10pF                             |
| C5     | ~10pF                             |
| L1     | W ≈ 1.5mm, l ≈ 25mm<br>Strip line |
| L2     | W ≈ 4mm, l ≈ 25mm<br>Strip line   |
| L3     | 0.5φ, l ≈ 40mm                    |
| CH     | 2t+bead core                      |

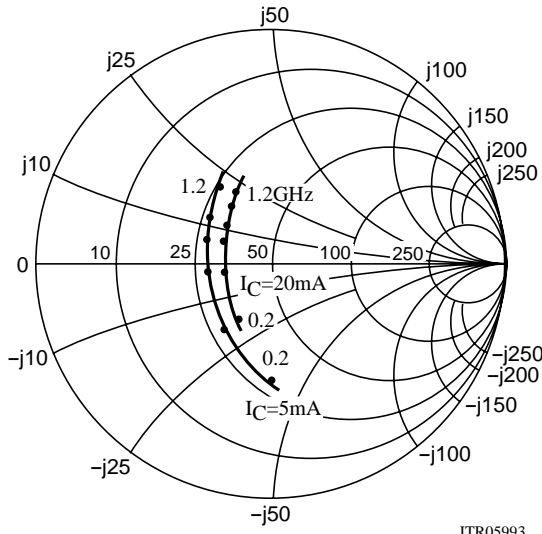




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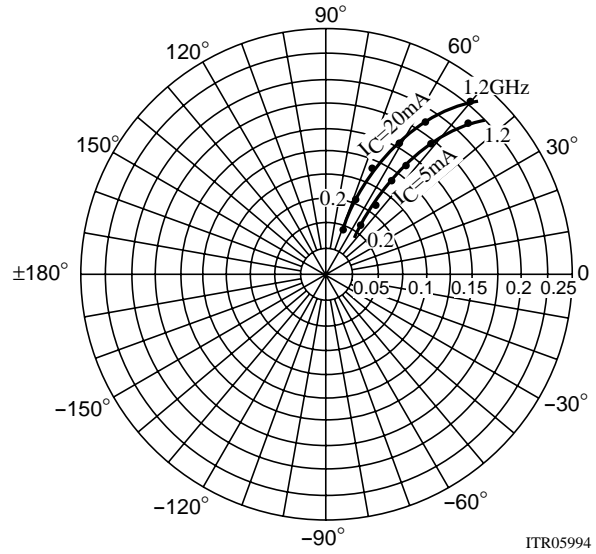
## S parameter

S11e :  $V_{CE}=10V$   
f=200MHz step



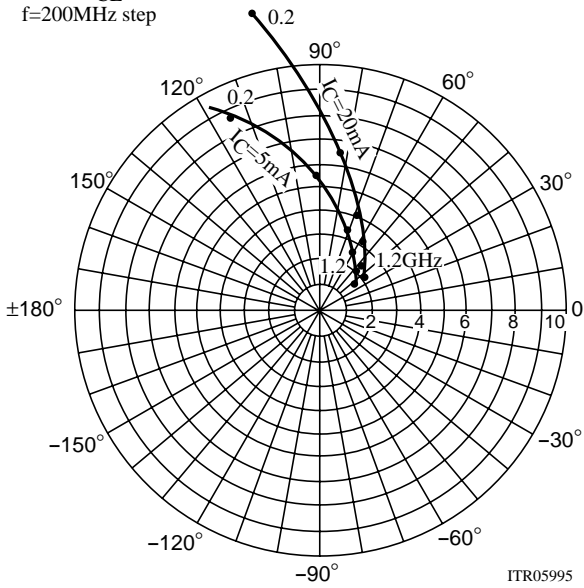
ITR05993

S12e :  $V_{CE}=10V$   
f=200MHz step



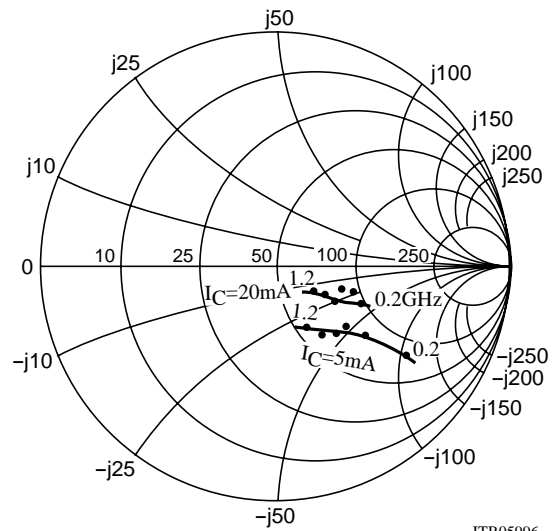
ITR05994

S21e :  $V_{CE}=10V$   
f=200MHz step



ITR05995

S22e :  $V_{CE}=10V$   
f=200MHz step



ITR05996

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