

**2SC3775**

UHF Low-Noise Amplifier, Wide-Band Amplifier Applications

Applications

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

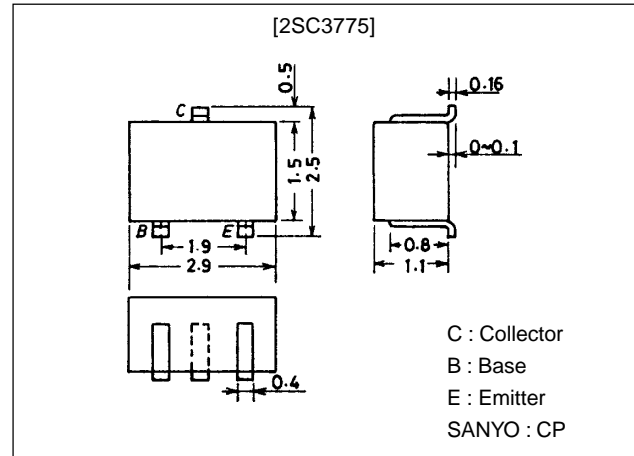
Features

- Small noise figure : $NF=1.5\text{dB typ (}f=0.9\text{GHz)}$.
- High power gain : $MAG=14\text{dB typ (}f=0.9\text{GHz)}$.
- High cutoff frequency : $f_T=5.0\text{GHz typ}$.

Package Dimensions

unit:mm

2018A



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} | | 12 | V |
| Emitter-to-Base Voltage | V_{EBO} | | 3 | V |
| Collector Current | I_C | | 100 | mA |
| Base Current | I_B | | 30 | mA |
| Collector Dissipation | P_C | | 250 | 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} | $V_{CB}=12\text{V}, I_E=0$ | | | 1.0 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=2\text{V}, I_C=0$ | | | 10 | μA |
| 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} | $V_{CB}=10\text{V}, f=1\text{MHz}$ | | 0.9 | | pF |
| Reverse Transfer Capacitance | C_{re} | $V_{CB}=10\text{V}, f=1\text{MHz}$ | | 0.6 | | pF |

* : The 2SC3775 is classified by 20mA h_{FE} as follows :

| | | | | | | | | |
|----|---|----|----|---|-----|-----|---|-----|
| 40 | 2 | 80 | 60 | 3 | 120 | 100 | 4 | 200 |
|----|---|----|----|---|-----|-----|---|-----|

(Note) Marking : OY

h_{FE} rank : 2, 3, 4

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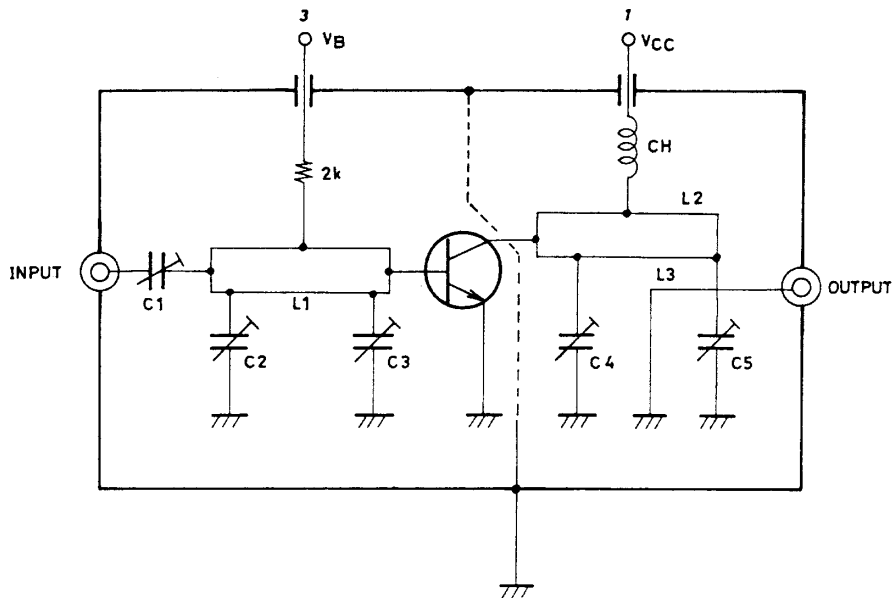
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N3098HA (KT)/5318MO/5137KI/O185KI, TS No.1948-1/5

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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 | $V_{CE}=10V, I_C=5mA, f=0.9GHz,$ See specified Test Circuit. | | 1.5 | 3.0 | dB |

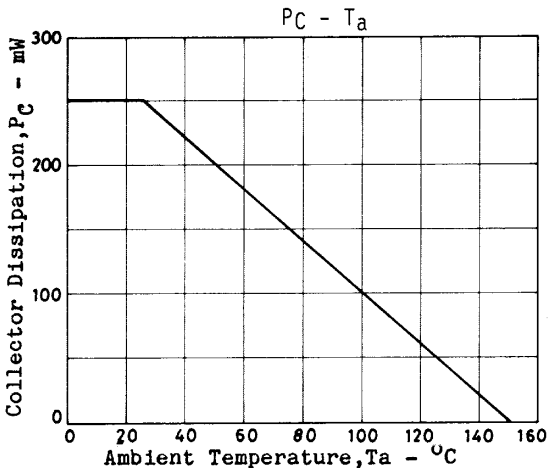
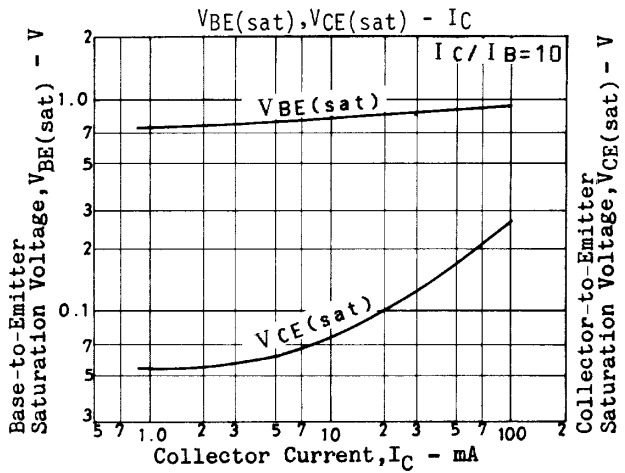
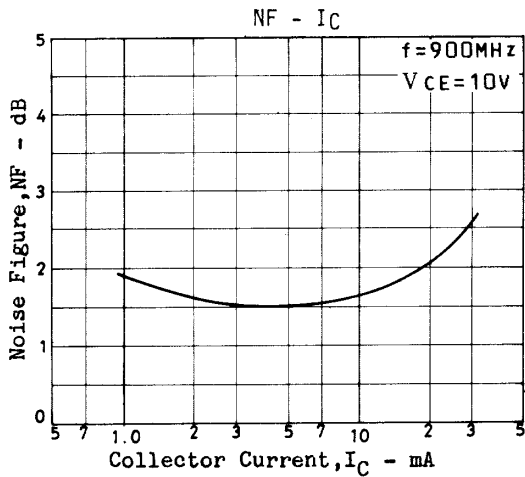
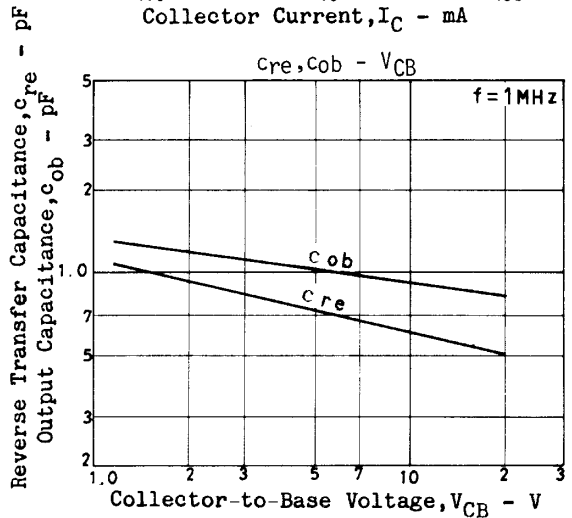
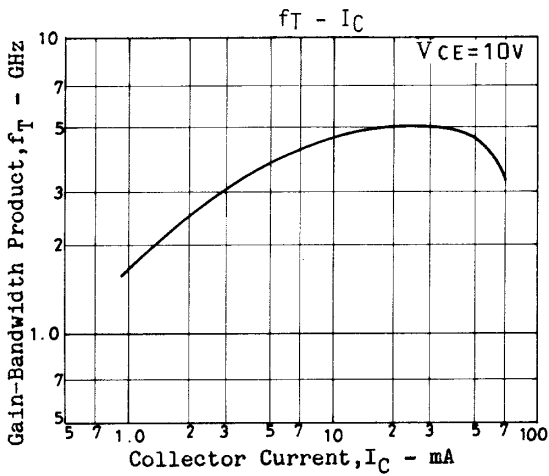
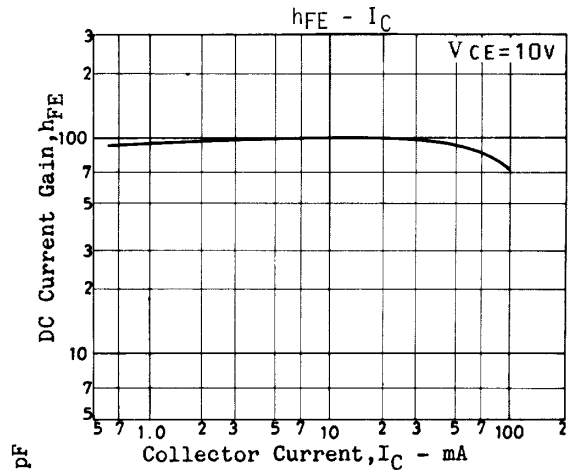
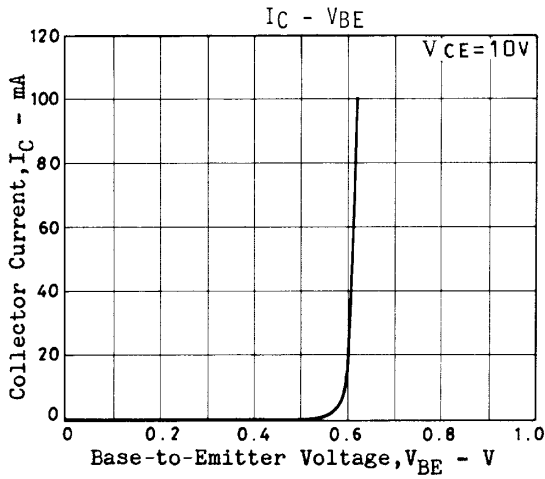
NF Test Circuit



Unit (resistance : Ω)

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

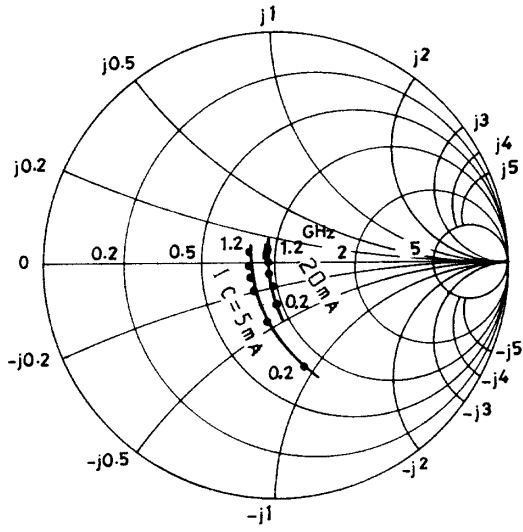
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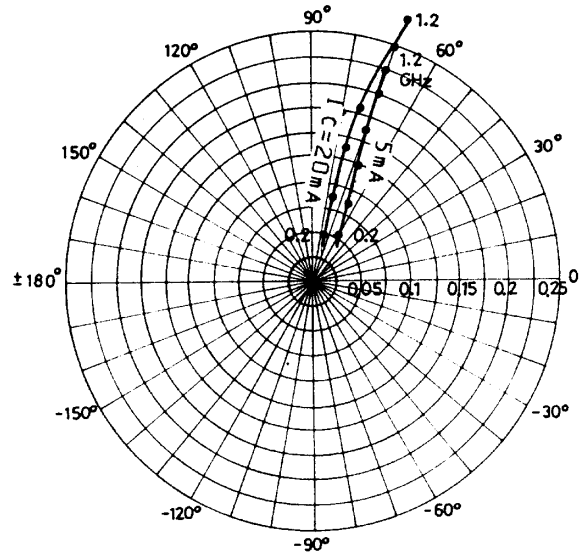
S11e : VCE=10V

f=200MHz step



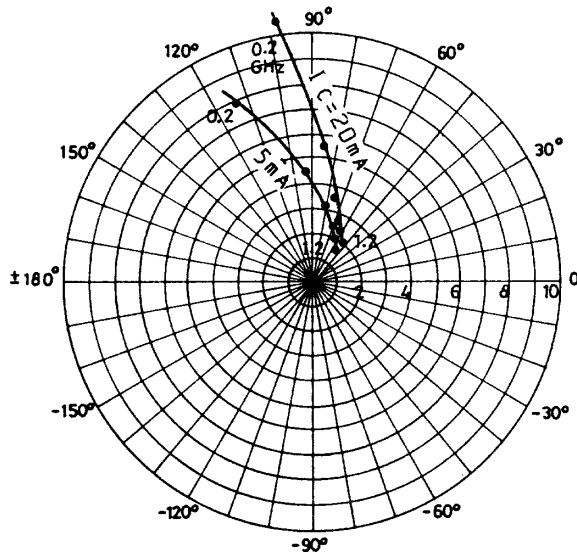
S12e : VCE=10V

f=200MHz step



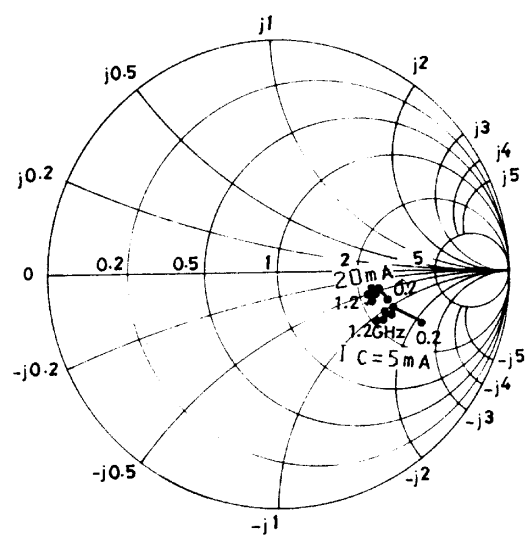
S21e : VCE=10V

f=200MHz step



S22e : VCE=10V

f=200MHz step



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