

**2SC3773**

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

### Applications

- UHF frequency converters, local oscillators, low-noise amplifiers, wide-band amplifiers.

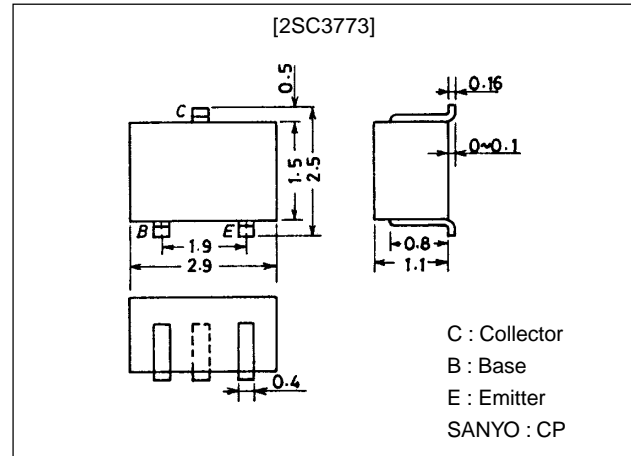
### Features

- Small noise figure : NF=3.0dB typ (f=0.9GHz).
- High power gain : MAG=12dB typ (f=0.9GHz).
- High cutoff frequency :  $f_T=3.5$ 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    | $V_{CB0}$ |            | 25          | V                |
| Collector-to-Emitter Voltage | $V_{CE0}$ |            | 16          | V                |
| Emitter-to-Base Voltage      | $V_{EB0}$ |            | 3           | V                |
| Collector Current            | $I_C$     |            | 50          | mA               |
| Base Current                 | $I_B$     |            | 20          | 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     | $I_{CBO}$ | $V_{CB}=16\text{V}, I_E=0$          |         |      | 1.0  | $\mu\text{A}$ |
| Emitter Cutoff Current       | $I_{EBO}$ | $V_{EB}=2\text{V}, I_C=0$           |         |      | 10   | $\mu\text{A}$ |
| DC Current Gain              | $h_{FE}$  | $V_{CE}=10\text{V}, I_C=5\text{mA}$ | 40*     |      | 200* |               |
| Gain-Bandwidth Product       | $f_T$     | $V_{CE}=10\text{V}, I_C=5\text{mA}$ | 1.8     | 3.5  |      | GHz           |
| Output Capacitance           | $C_{ob}$  | $V_{CB}=10\text{V}, f=1\text{MHz}$  |         | 0.6  | 1.0  | pF            |
| Reverse Transfer Capacitance | $C_{re}$  | $V_{CB}=10\text{V}, f=1\text{MHz}$  |         | 0.45 |      | pF            |

\* : The 2SC3773 is classified by 5mA  $h_{FE}$  as follows :

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

(Note) Marking : MY

 $h_{FE}$  rank : 2, 3, 4

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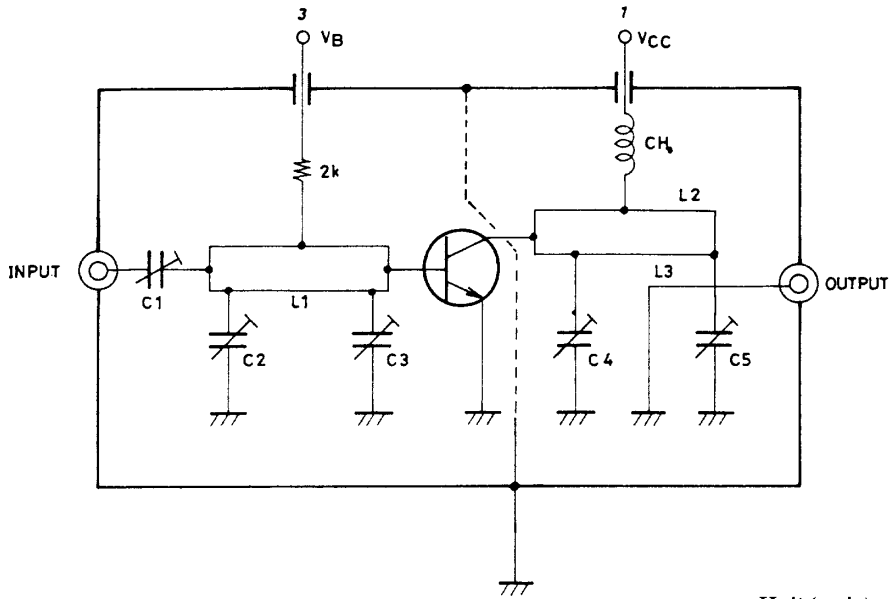
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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# 2SC3773

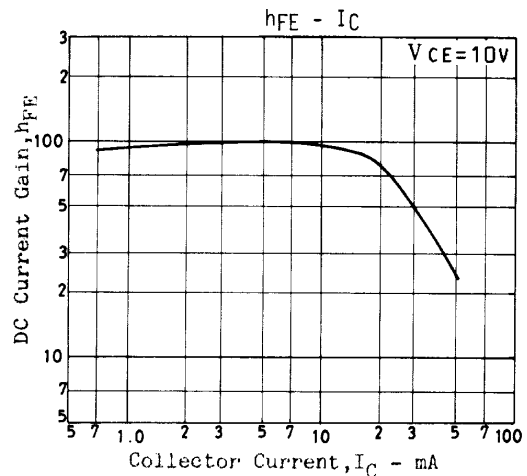
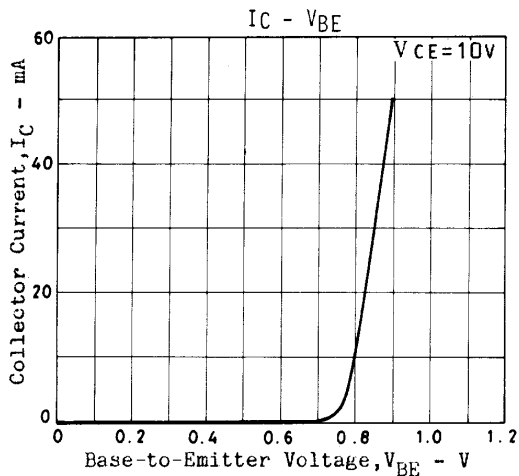
| Parameter                    | Symbol        | Conditions   | Ratings |     |     | Unit |
|------------------------------|---------------|--|---------|-----|-----|------|
|                              |               |  | min     | typ | max |      |
| Forward Transfer Gain        | $ S_{21e} ^2$ | $V_{CE}=10V, I_C=10mA, f=0.9GHz$                                 | 7.5     | 9   |     | dB   |
| Maximum Available Power Gain | MAG           | $V_{CE}=10V, I_C=10mA, f=0.9GHz$                                 |         | 12  |     | dB   |
| Noise Figure                 | NF            | $V_{CE}=10V, I_C=3mA, f=0.9GHz$ ,<br>See specified Test Circuit. |         | 3.0 | 5.0 | dB   |

## NF Test Circuit

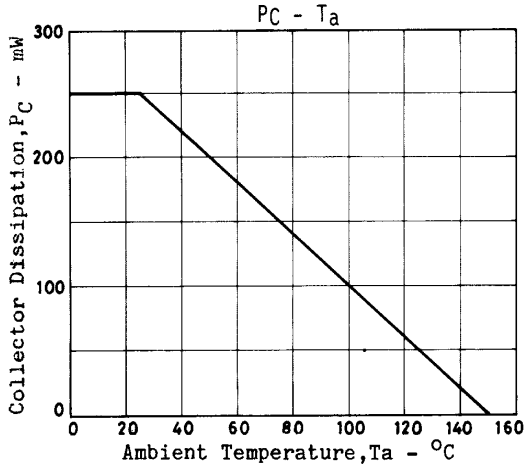
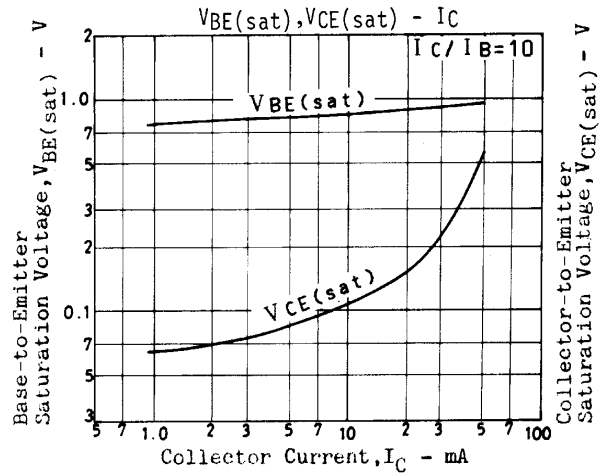
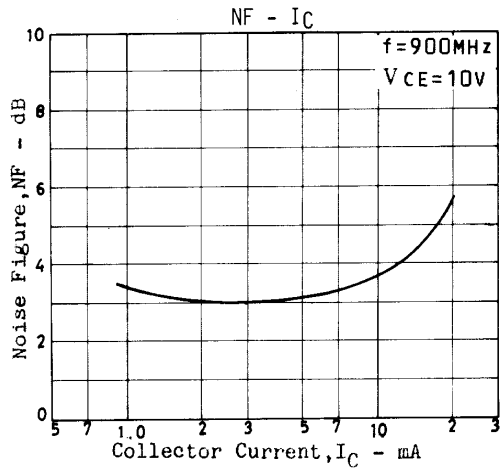
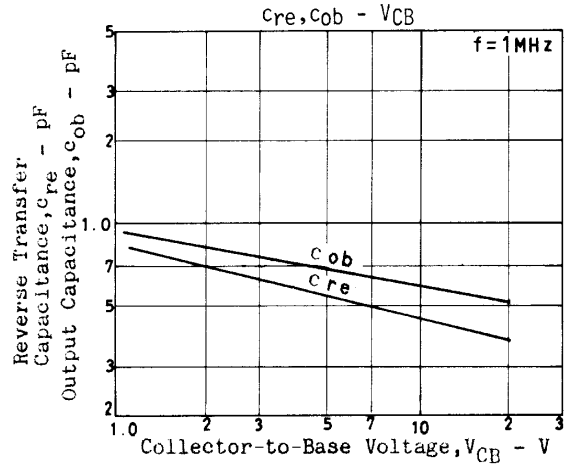
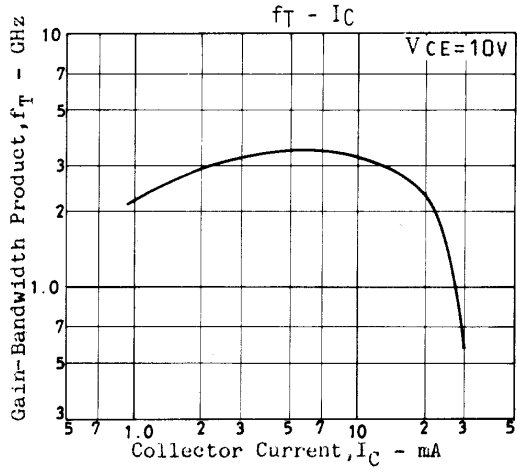


Unit (resistance :  $\Omega$ )

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

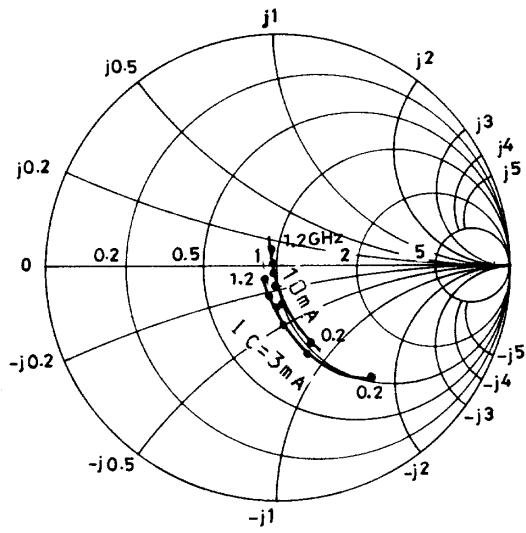


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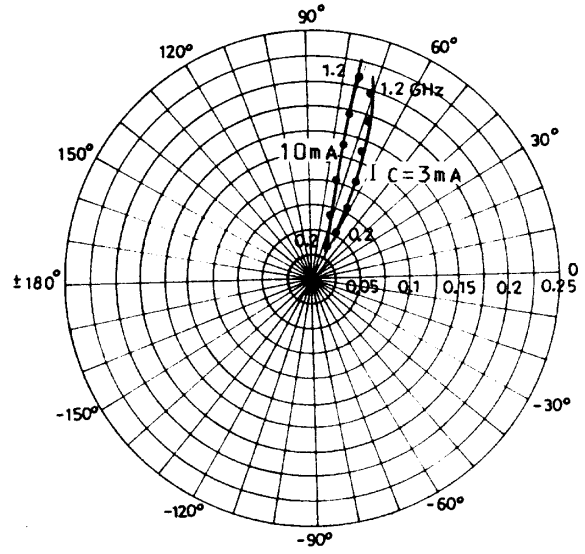


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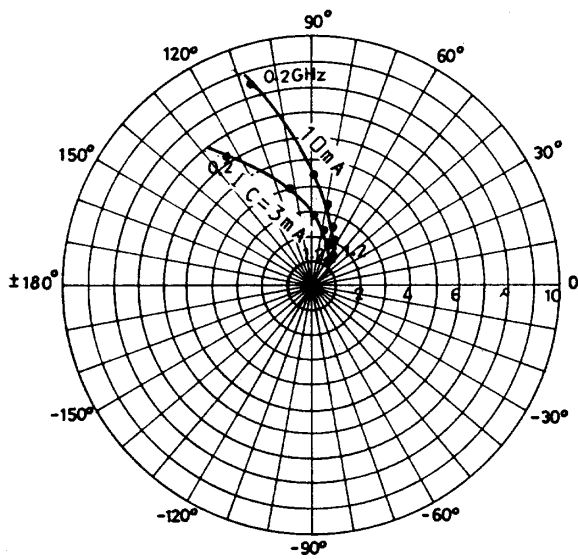
S11e : VCE=10V  
f=200MHz step



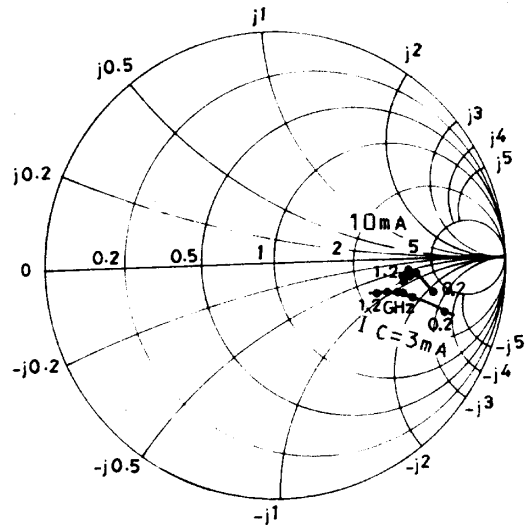
S12e : VCE=10V  
f=200MHz step



S21e : VCE=10V  
f=200MHz step



S22e : VCE=10V  
f=200MHz step



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