


|                                                                                   |         |                                                                                                      |
|-----------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------|
|  | No.2757 | 2SC4404                                                                                              |
|                                                                                   |         | NPN Epitaxial Planar Silicon Transistor<br>UHF Local Oscillator,<br>Wide-Band Amplifier Applications |

**Applications**

- UHF OSC, wide-band amplifiers

**Features**

- High cutoff frequency :  $f_T = 5.0\text{GHz}$  typ
- High power gain :  $\text{MAG} = 14\text{dB}$  typ ( $f = 0.9\text{GHz}$ )
- Small noise figure :  $\text{NF} = 2.2\text{dB}$  typ ( $f = 0.9\text{GHz}$ )
- Very small-sized package permitting 2SC4404-applied sets to be made smaller and slimmer

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

|                              |           | 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            | $I_C$     | 70 mA                        |
| Collector Dissipation        | $P_C$     | 150 mW                       |
| Junction Temperature         | $T_j$     | 150 $^\circ\text{C}$         |
| Storage Temperature          | $T_{stg}$ | -55 to +150 $^\circ\text{C}$ |

**Electrical Characteristics at  $T_a = 25^\circ\text{C}$** 

|                              |              |                                                             | min          | typ  | max           | unit          |
|------------------------------|--------------|-------------------------------------------------------------|--------------|------|---------------|---------------|
| 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              | $h_{FE}$     | $V_{CE} = 10\text{V}, I_C = 20\text{mA}$                    | $\approx 40$ |      | $\approx 200$ |               |
| Gain-Bandwidth Product       | $f_T$        | $V_{CE} = 10\text{V}, I_C = 20\text{mA}$                    |              | 5.0  |               | GHz           |
| Output Capacitance           | $c_{ob}$     | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                      |              | 0.75 | 1.1           | pF            |
| Reverse Transfer Capacitance | $c_{re}$     | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                      |              | 0.5  |               | pF            |
| Forward Transfer Gain        | $ S_{21} ^2$ | $V_{CE} = 10\text{V}, I_C = 20\text{mA}, f = 0.9\text{GHz}$ |              | 14   |               | dB            |
| Maximum Available Power Gain | $\text{MAG}$ | $V_{CE} = 10\text{V}, I_C = 20\text{mA}, f = 0.9\text{GHz}$ |              | 14   |               | dB            |
| Noise Figure                 | $\text{NF}$  | $V_{CE} = 10\text{V}, I_C = 5\text{mA}, f = 0.9\text{GHz}$  |              | 2.2  |               | dB            |

See specified Test Circuit.

※ The 2SC4404 is classified by 20mA  $h_{FE}$  as follows:

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

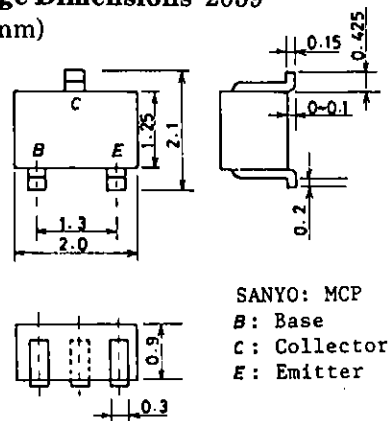
(Note) Marking: NY

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

• For CP package version, use the 2SC3774.

**Package Dimensions 2059**

(unit: mm)



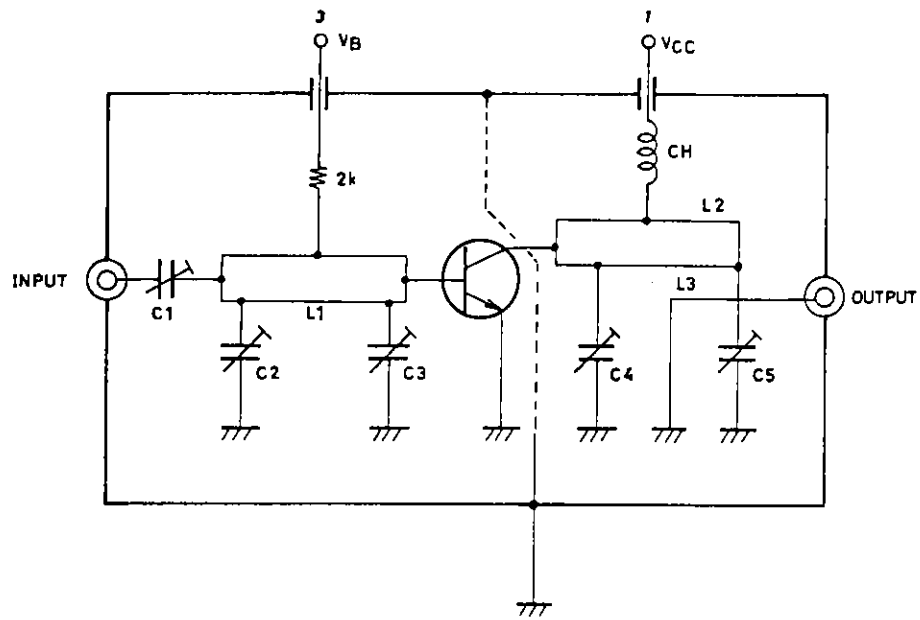
SANYO: MCP

B: Base

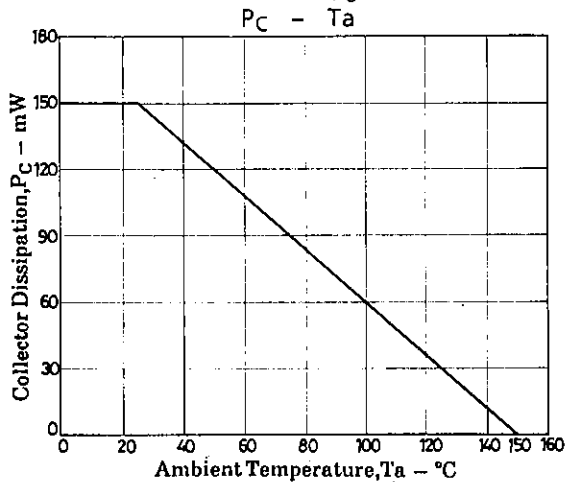
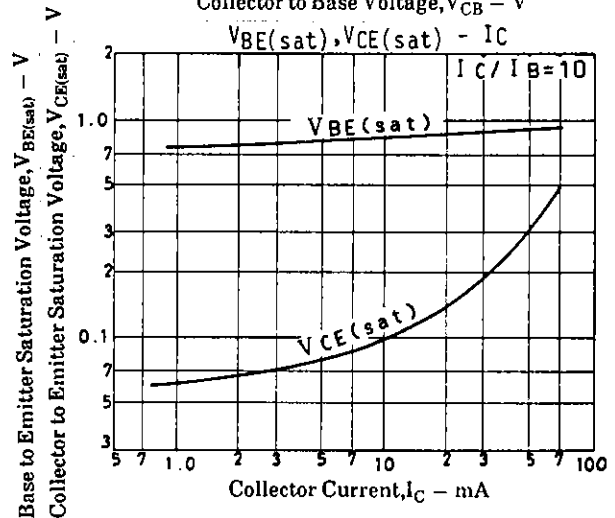
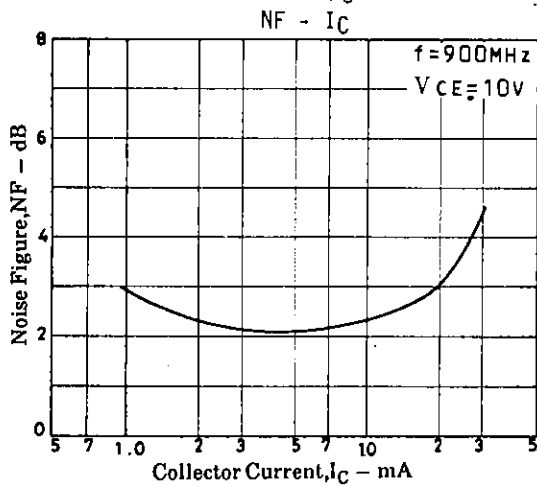
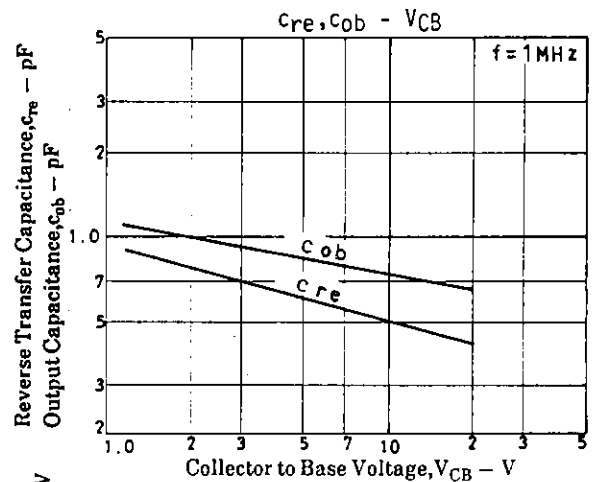
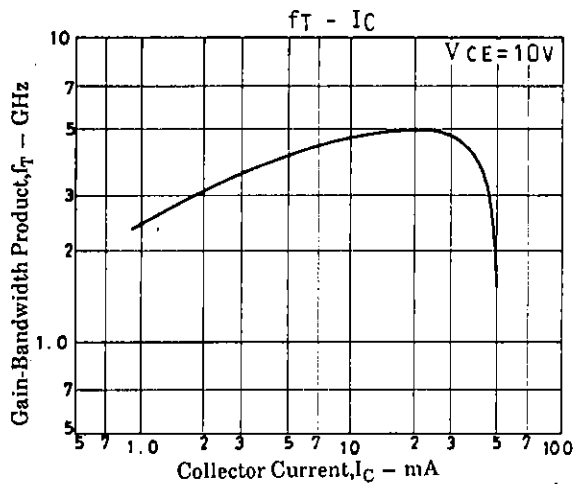
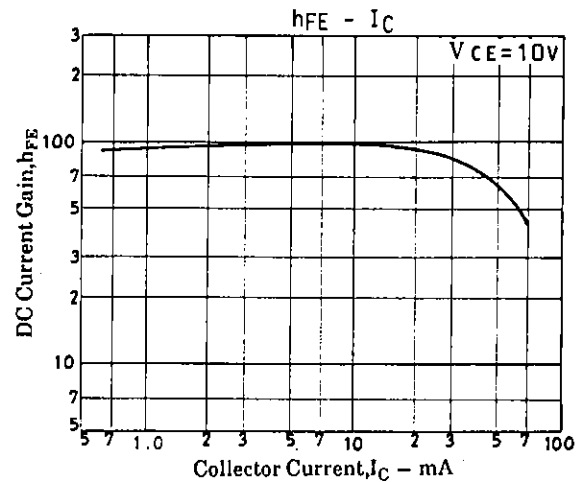
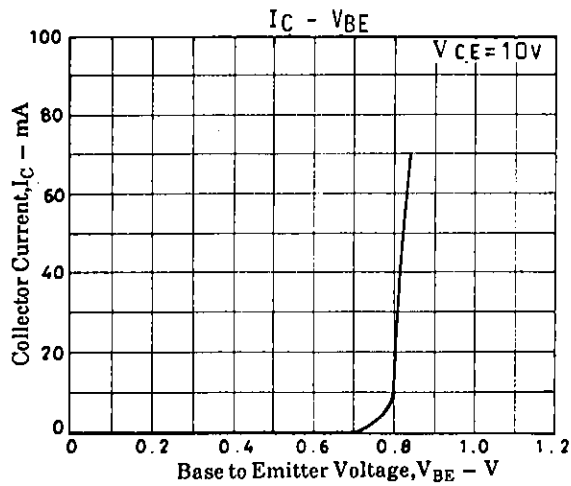
C: Collector

E: Emitter

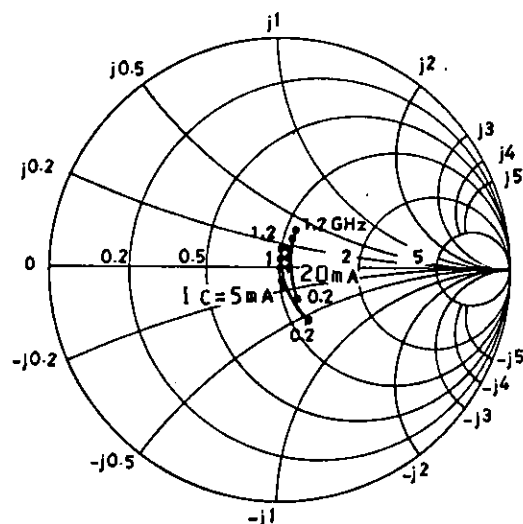
## NF Test Circuit

Unit (Resistance :  $\Omega$ )

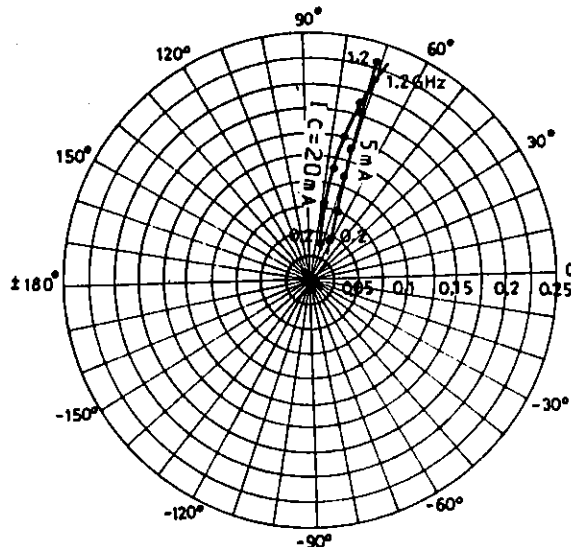
|    | 900MHz                             |
|----|------------------------------------|
| C1 | ~5 pF                              |
| C2 | ~10 pF                             |
| C3 | ~10 pF                             |
| C4 | ~10 pF                             |
| C5 | ~10 pF                             |
| L1 | W ≐ 1.5mm, l ≐ 2.5mm<br>strip line |
| L2 | W ≐ 4mm, l ≐ 2.5mm<br>strip line   |
| L3 | 0.5φ, l ≐ 4.0mm                    |
| CH | 2t+bead core                       |



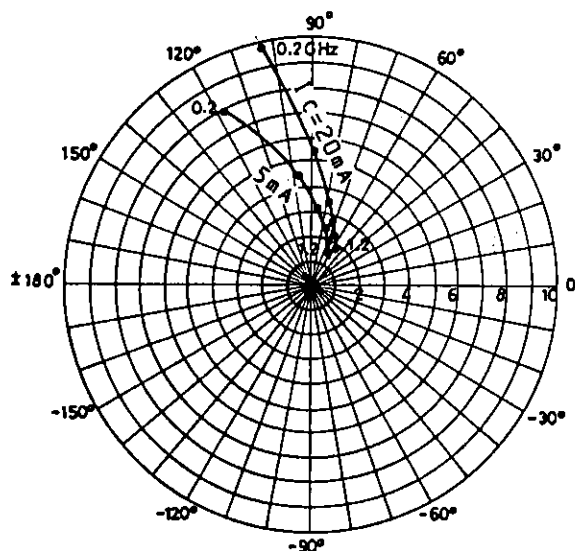
S11e :  $V_{CE}=10V$   
 $f=200MHz$  step



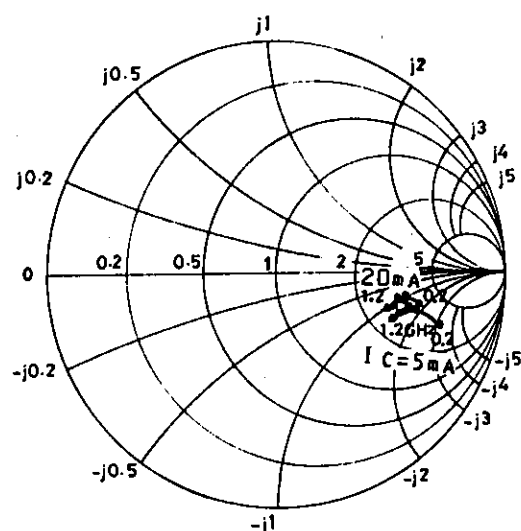
S12e :  $V_{CE}=10V$   
 $f=200MHz$  step



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



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



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