

NPN Epitaxial Planar Silicon Transistor  
HIGH  $h_{FE}$ , LOW FREQUENCY,  
GENERAL-PURPOSE AMP APPLICATIONS

## Applications

- Low frequency general-purpose amplifiers, drivers

## Features

- . Large current capacity ( $I_C=2A$ )
- . Adoption of MBIT process
- . High DC current gain ( $h_{FE}=800$  to  $3200$ )
- . Low collector-to-emitter saturation voltage ( $V_{CE(sat)} \leq 0.5V$ )
- . High  $V_{EBO}$  ( $V_{EBO} \geq 15V$ )

### Absolute Maximum Ratings at Ta=25°C

| Absolute Maximum Ratings at Ta=25°C |                      |             | unit |
|-------------------------------------|----------------------|-------------|------|
| Collector to Base Voltage           | V <sub>CB0</sub>     | 30          | V    |
| Collector to Emitter Voltage        | V <sub>CEO</sub>     | 25          | V    |
| Emitter to Base Voltage             | V <sub>EB0</sub>     | 15          | V    |
| Collector Current                   | I <sub>C</sub>       | 2           | A    |
| Peak Collector Current              | i <sub>cp</sub>      | 4           | A    |
| Collector Dissipation               | P <sub>c</sub>       | 1.2         | W    |
|                                     | T <sub>c</sub> =25°C | 15          | W    |
| Junction Temperature                | T <sub>j</sub>       | 150         | °C   |
| Storage Temperature                 | T <sub>stg</sub>     | -55 to +150 | °C   |

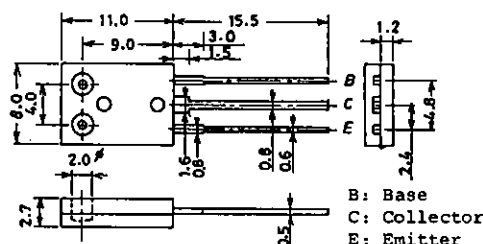
### Electrical Characteristics at Ta=25°C

| Electrical Characteristics at Ta=25°C   |               |                        | min | typ  | max  | unit    |
|-----------------------------------------|---------------|------------------------|-----|------|------|---------|
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=20V, I_E=0$    |     |      | 0.1  | $\mu A$ |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=10V, I_C=0$    |     |      | 0.1  | $\mu A$ |
| DC Current Gain                         | $h_{FE}(1)$   | $V_{CE}=5V, I_C=500mA$ | 800 | 1500 | 3200 |         |
|                                         | $h_{FE}(2)$   | $V_{CE}=5V, I_C=1A$    | 600 |      |      |         |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=10V, I_C=50mA$ |     | 260  |      | MHz     |
| Output Capacitance                      | $c_{ob}$      | $V_{CE}=10V, f_c=1MHz$ |     | 27   |      | pF      |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=1A, I_B=20mA$     |     | 0.15 | 0.5  | V       |
| Base to Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=1A, I_B=20mA$     |     | 0.85 | 1.2  | V       |
| Collector to Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=10\mu A, I_E=0$   | 30  |      |      | V       |

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### Package Dimensions 2043A

( unit: mm )



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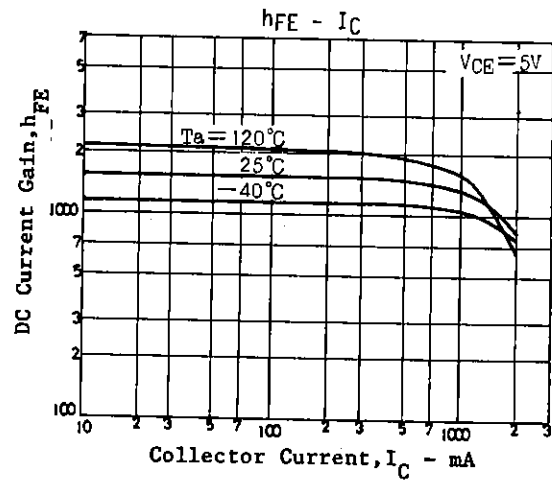
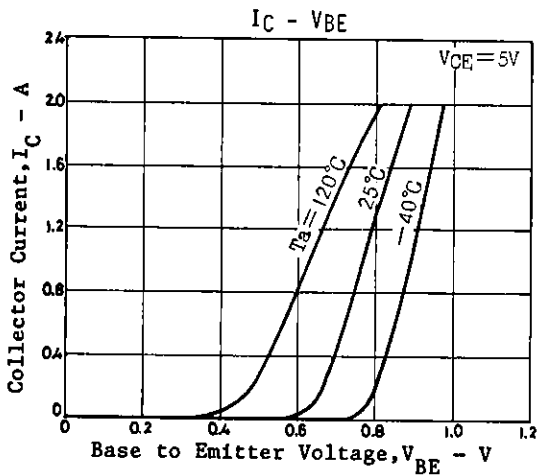
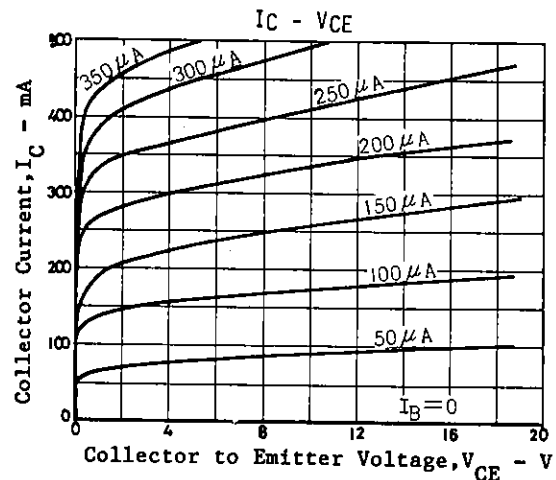
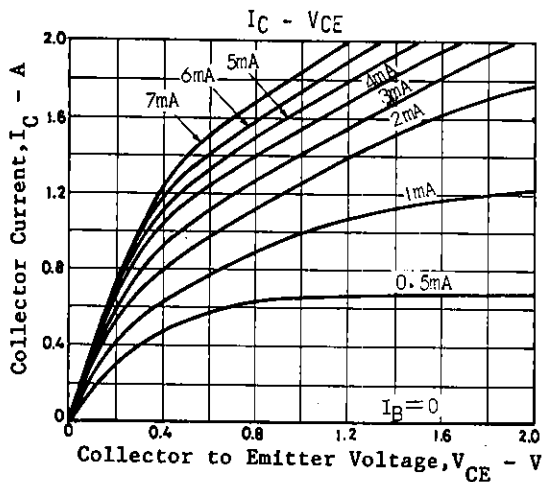
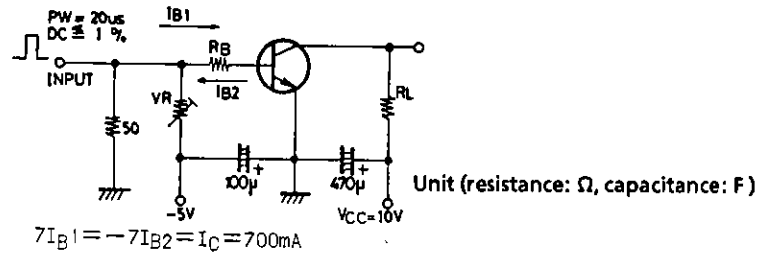
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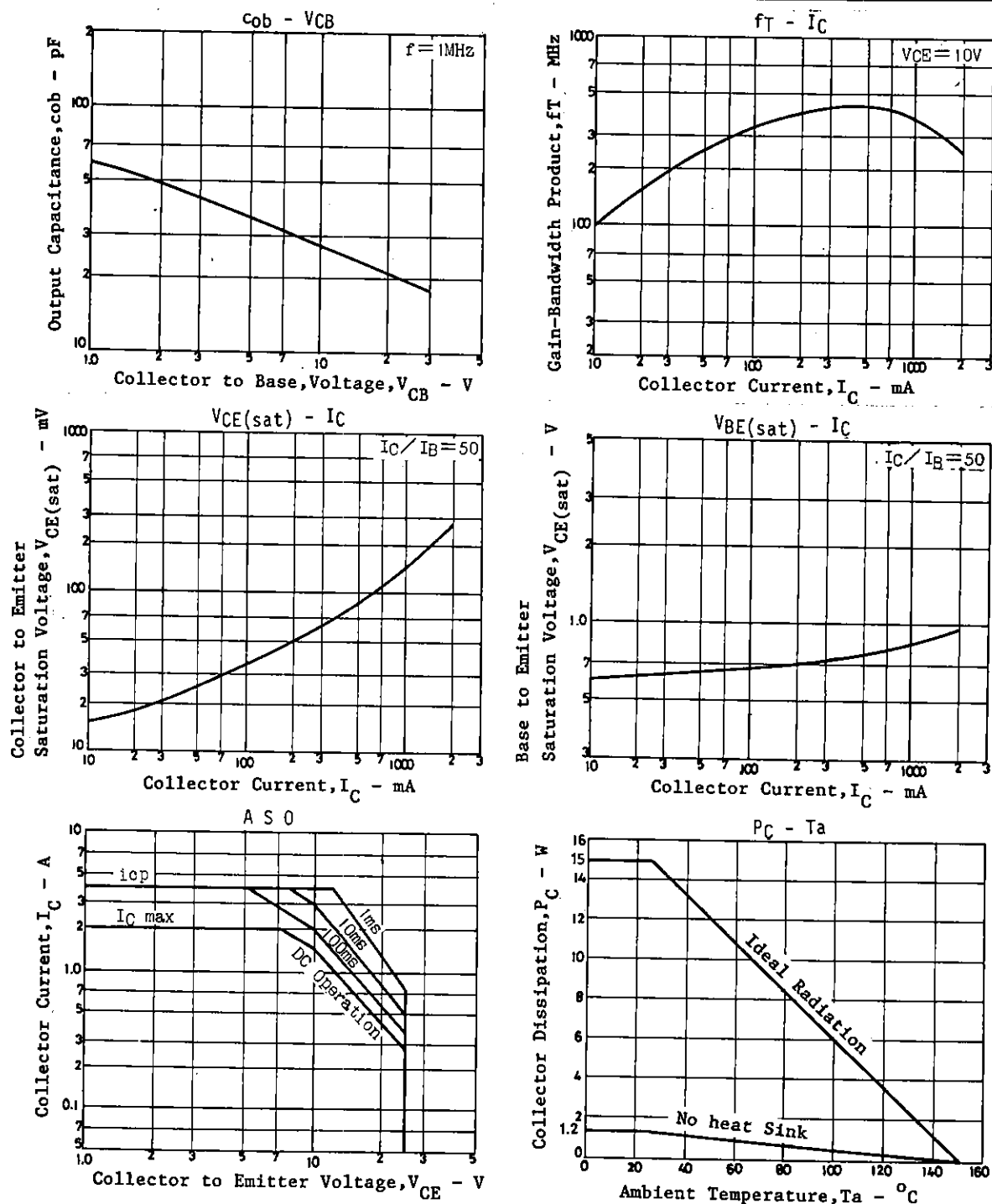
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|                                        |               |                                     |           |     |     |               |
|----------------------------------------|---------------|-------------------------------------|-----------|-----|-----|---------------|
| Collector to Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 1\text{mA}, R_{BE} = \infty$ | min<br>25 | typ | max | unit<br>V     |
| Emitter to Base Breakdown Voltage      | $V_{(BR)EBO}$ | $I_E = 10\mu\text{A}, I_C = 0$      | 15        |     |     | V             |
| Turn-on time                           | $t_{on}$      | See specified Test Circuit.         | 0.14      |     |     | $\mu\text{s}$ |
| Storage Temperature                    | $t_{stg}$     | "                                   | 1.35      |     |     | $\mu\text{s}$ |
| Fall Time                              | $t_f$         | "                                   | 0.1       |     |     | $\mu\text{s}$ |

## Switching Time Test Circuit





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