



# 2SA2201

PNP Epitaxial Planar Silicon Transistor

## High-Voltage Switching Applications

### Applications

- DC / DC converters, relay drivers, lamp drivers, motor drivers.

### Features

- Adoption of FBET, MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- High allowable power dissipation.

### Specifications

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

| Parameter                    | Symbol    | Conditions   | Ratings     | Unit             |
|------------------------------|-----------|--|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |  | -80         | V                |
| Collector-to-Emitter Voltage | $V_{CES}$ |  | -80         | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |  | -80         | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |  | -7          | V                |
| Collector Current            | $I_C$     |  | -2.5        | A                |
| Collector Current (Pulse)    | $I_{CP}$  |  | -4          | A                |
| Base Current                 | $I_B$     |  | -500        | mA               |
| Collector Dissipation        | $P_C$     | Mounted on a ceramic board (250mm <sup>2</sup> ×0.8mm) | 1.3         | W                |
|                              |           | $T_c=25^\circ\text{C}$                                 | 3.5         | W                |
| 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 | $I_{CBO}$ | $V_{CB}=-70\text{V}, I_E=0\text{A}$     |         |     | -1  | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=-4\text{V}, I_C=0\text{A}$      |         |     | -1  | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE}$  | $V_{CE}=-5\text{V}, I_C=-100\text{mA}$  | 200     |     | 400 |               |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE}=-10\text{V}, I_C=-500\text{mA}$ |         | 350 |     | MHz           |
| Output Capacitance       | $C_{ob}$  | $V_{CB}=-10\text{V}, f=1\text{MHz}$     |         | 23  |     | pF            |

Marking : RB

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# 2SA2201

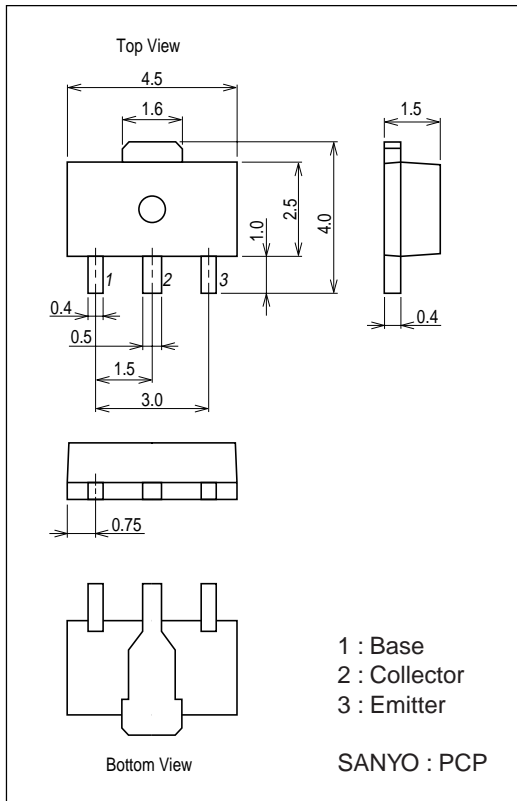
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| Parameter                               | Symbol        | Conditions                          | Ratings |       |      | Unit |
|---|---------------|-------------------------------------|---------|-------|------|------|
|   |               |                                     | min     | typ   | max  |      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = -1A, I_B = -100mA$           |         | -90   | -180 | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = -1A, I_B = -100mA$           |         | -0.85 | -1.2 | V    |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C = -10\mu A, I_E = 0A$          | -80     |       |      | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CES}$ | $I_C = -100\mu A, R_{BE} = 0\Omega$ | -80     |       |      | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C = -1mA, R_{BE} = \infty$       | -80     |       |      | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E = -10\mu A, I_C = 0A$          | -7      |       |      | V    |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit.         |         | 40    |      | ns   |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit.         |         | 500   |      | ns   |
| Fall Time                               | $t_f$         | See specified Test Circuit.         |         | 28    |      | ns   |

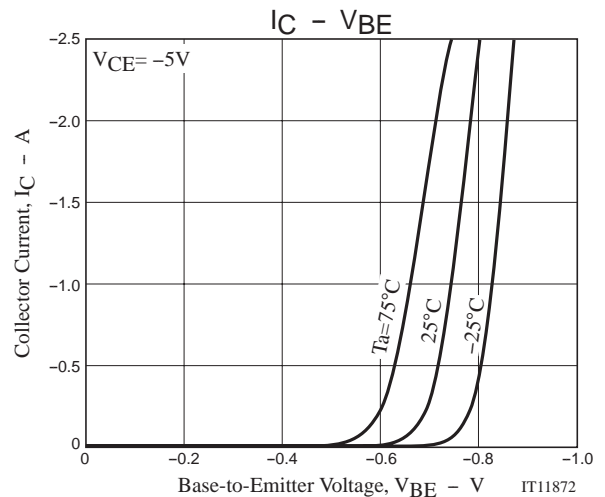
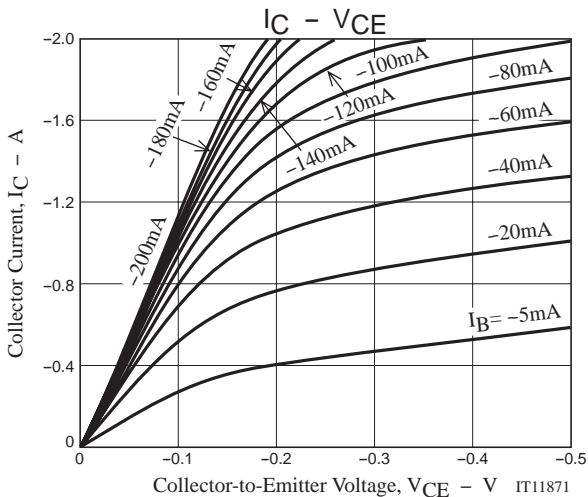
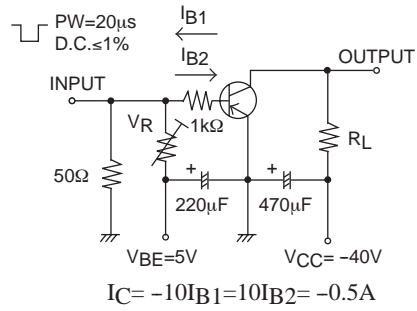
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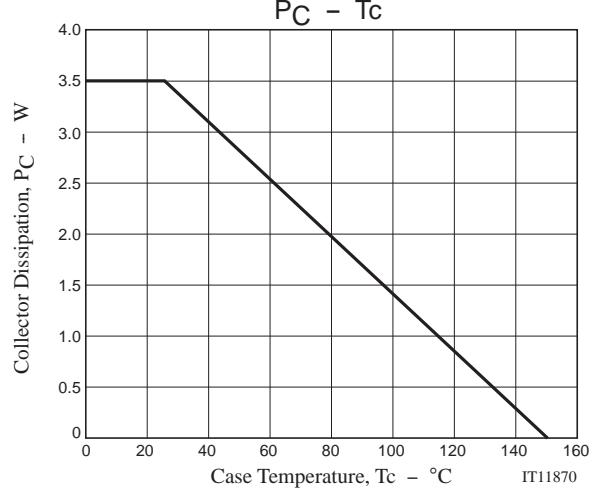
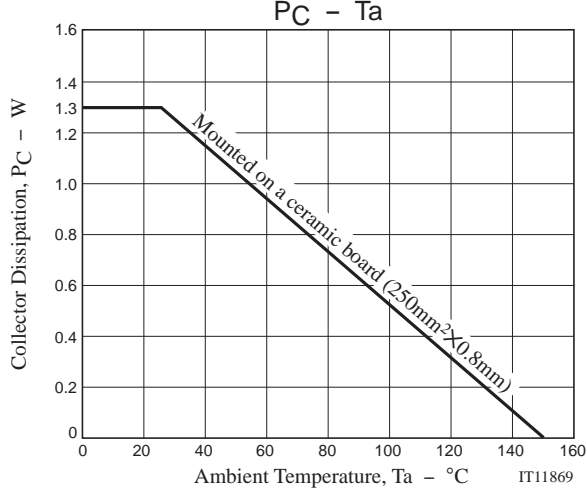
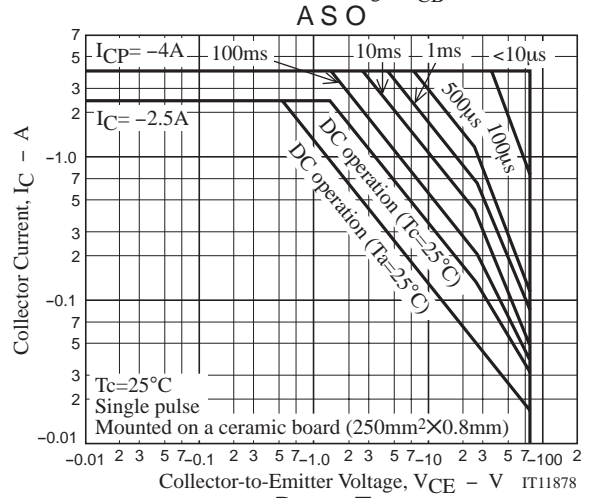
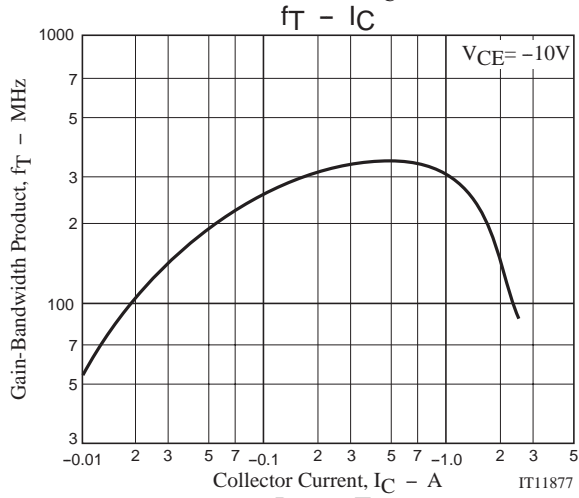
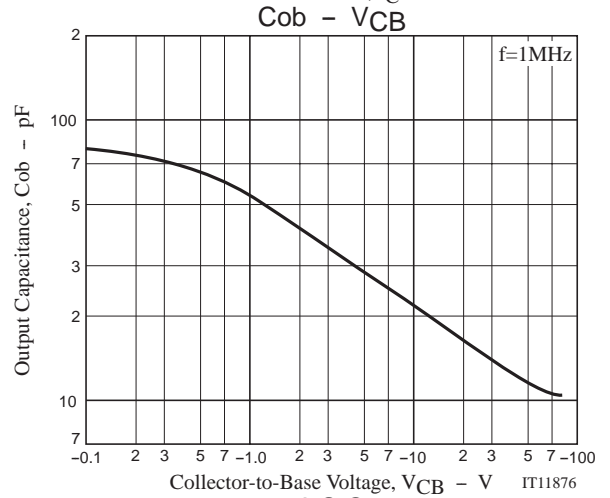
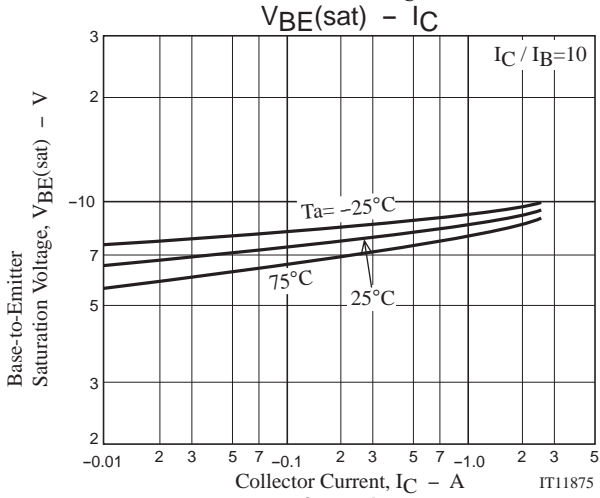
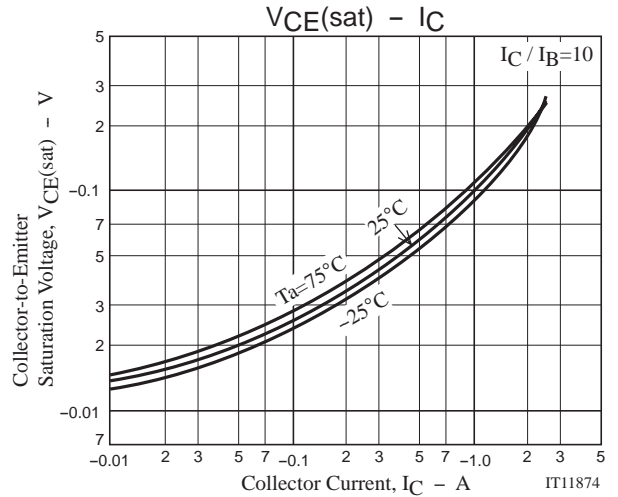
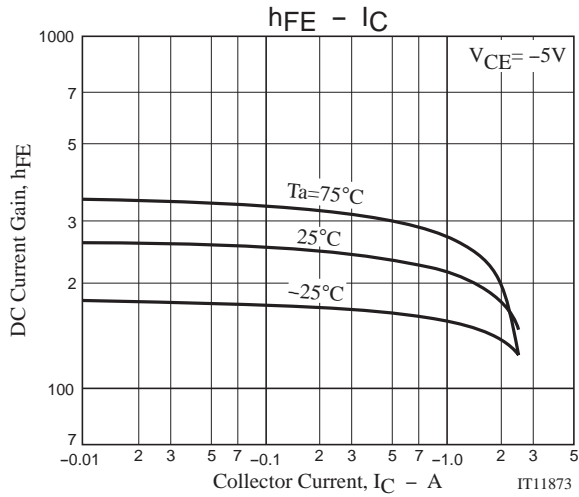
unit : mm (typ)

7007A-004



## Switching Time Test Circuit





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