


**SANYO Semiconductors**

# DATA SHEET

An ON Semiconductor Company

## 2SA2222 — PNP Epitaxial Planar Silicon Transistor

# High-Current Switching Applications

### Applications

- Relay drivers, lamp drivers, motor drivers.

### Features

- Adoption of MBIT process.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.

### Specifications

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

| Parameter                    | Symbol    | Conditions               | Ratings     | Unit               |
|------------------------------|-----------|--------------------------|-------------|--------------------|
| Collector-to-Base Voltage    | $V_{CB0}$ |                          | -50         | V                  |
| Collector-to-Emitter Voltage | $V_{CE0}$ |                          | -50         | V                  |
| Emitter-to-Base Voltage      | $V_{EB0}$ |                          | -6          | V                  |
| Collector Current            | $I_C$     |                          | -10         | A                  |
| Collector Current (Pulse)    | $I_{CP}$  |                          | -13         | A                  |
| Base Current                 | $I_B$     |                          | -2          | A                  |
| Collector Dissipation        | $P_C$     |                          | 2           | W                  |
|                              |           | $T_c=25^{\circ}\text{C}$ | 25          | W                  |
| Junction Temperature         | $T_J$     |                          | 150         | $^{\circ}\text{C}$ |
| Storage Temperature          | $T_{stg}$ |                          | -55 to +150 | $^{\circ}\text{C}$ |

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**SANYO Semiconductor Co., Ltd.**

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## 2SA2222

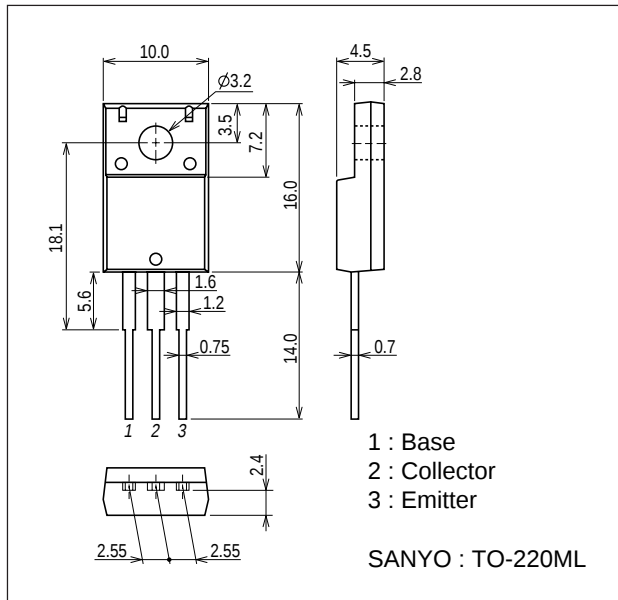
### Electrical Characteristics at $T_a=25^\circ\text{C}$

| Parameter                               | Symbol        | Conditions                                | Ratings |      |      | Unit          |
|-----------------------------------------|---------------|-------------------------------------------|---------|------|------|---------------|
|                                         |               |                                           | min     | typ  | max  |               |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=-40\text{V}$ , $I_E=0\text{A}$    |         |      | -10  | $\mu\text{A}$ |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=-4\text{V}$ , $I_C=0\text{A}$     |         |      | -10  | $\mu\text{A}$ |
| DC Current Gain                         | $h_{FE}$      | $V_{CE}=-2\text{V}$ , $I_C=-270\text{mA}$ | 150     |      | 450  |               |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=-10\text{V}$ , $I_C=-1\text{A}$   |         | 230  |      | MHz           |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=-10\text{V}$ , $f=1\text{MHz}$    |         | 115  |      | pF            |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-6\text{A}$ , $I_B=-300\text{mA}$    |         | -250 | -500 | mV            |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=-6\text{A}$ , $I_B=-300\text{mA}$    |         |      | -1.2 | V             |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=-100\mu\text{A}$ , $I_E=0\text{A}$   | -50     |      |      | V             |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=-1\text{mA}$ , $R_{BE}=\infty$       | -50     |      |      | V             |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=-100\mu\text{A}$ , $I_C=0\text{A}$   | -6      |      |      | V             |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit.               |         | 40   |      | ns            |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit.               |         | 240  |      | ns            |
| Fall Time                               | $t_f$         | See specified Test Circuit.               |         | 22   |      | ns            |

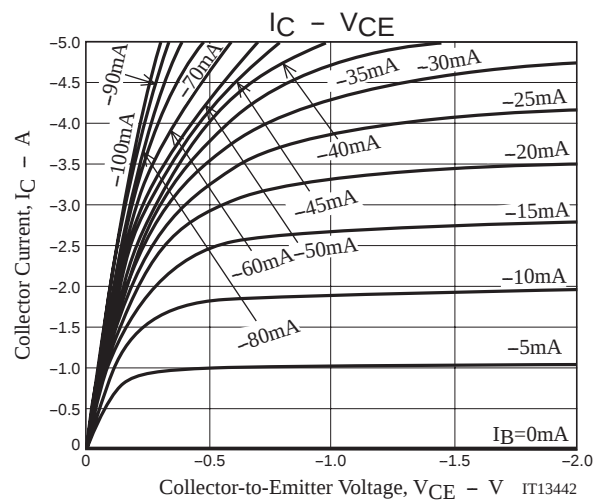
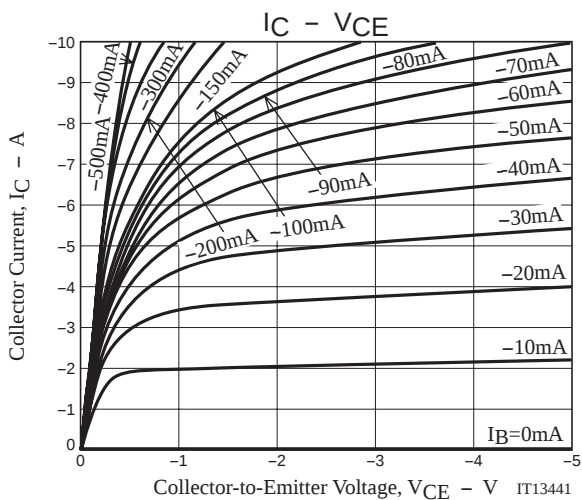
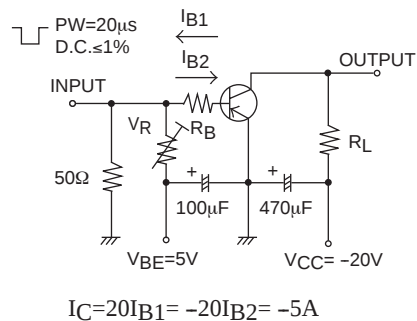
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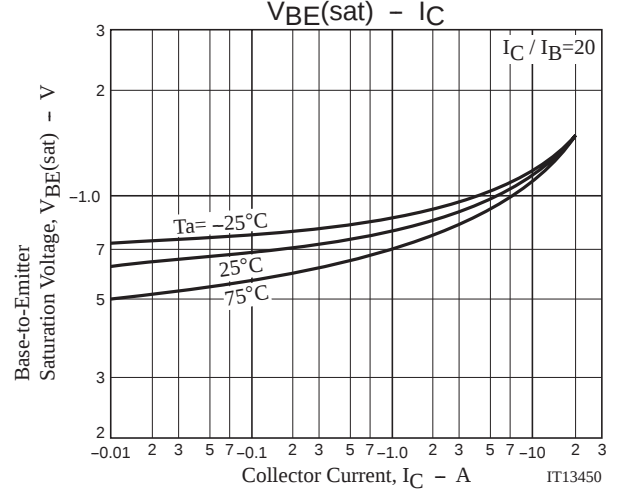
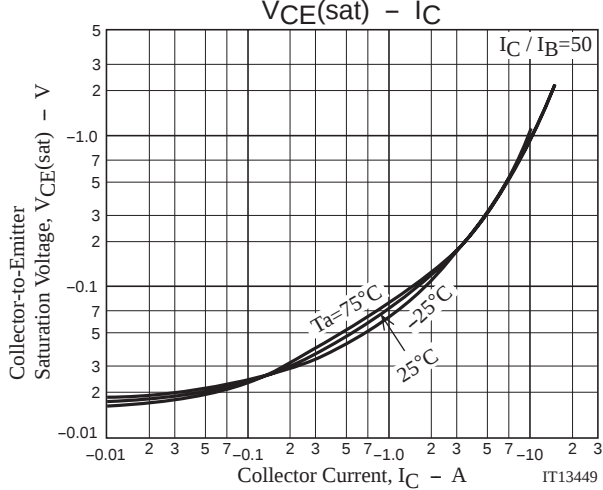
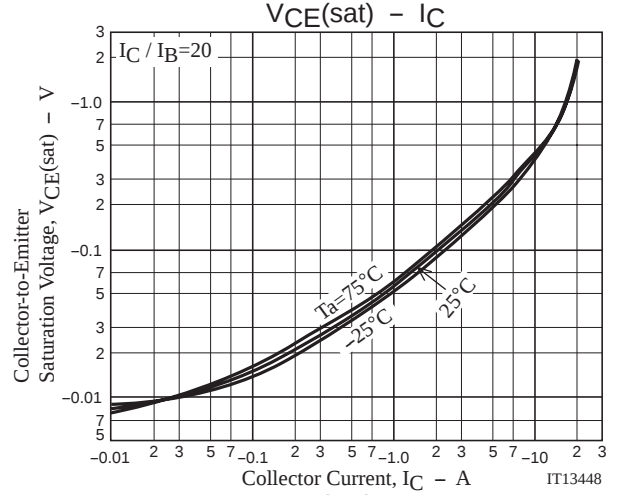
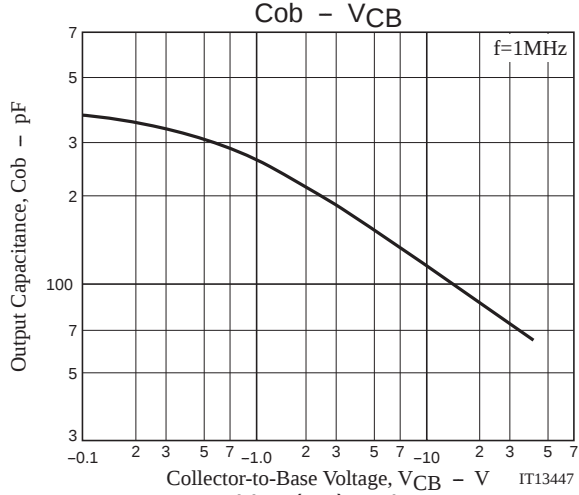
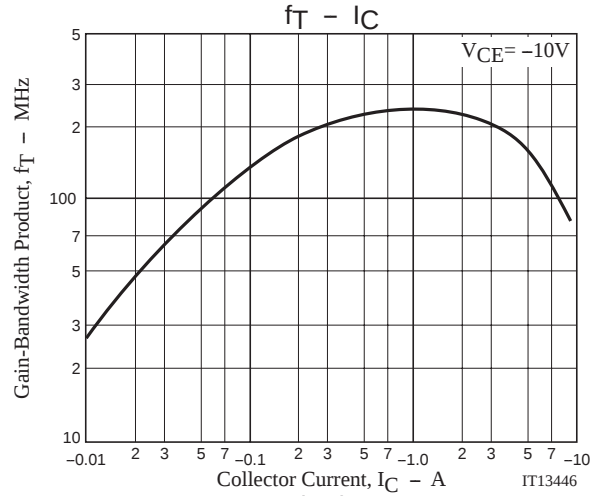
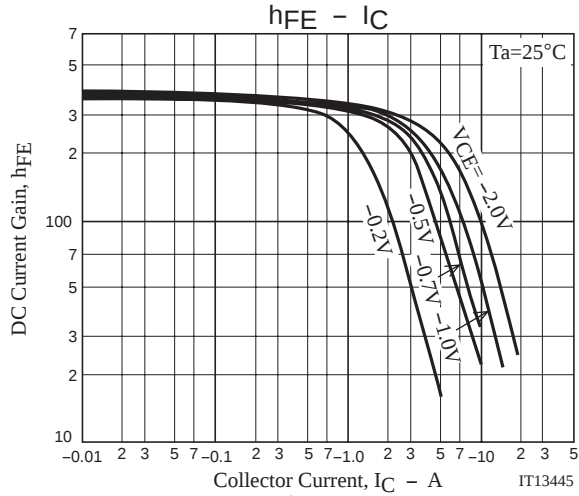
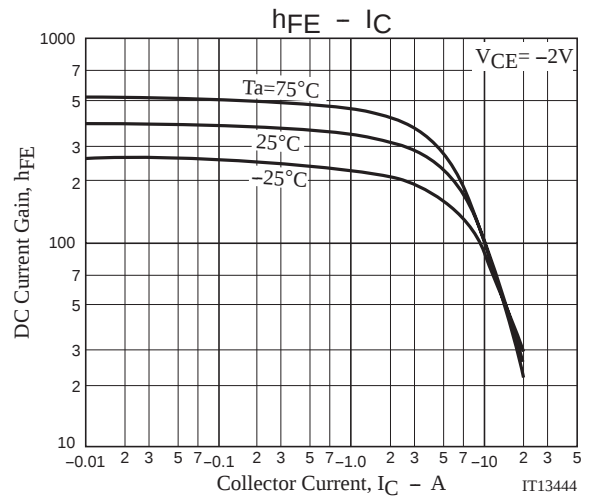
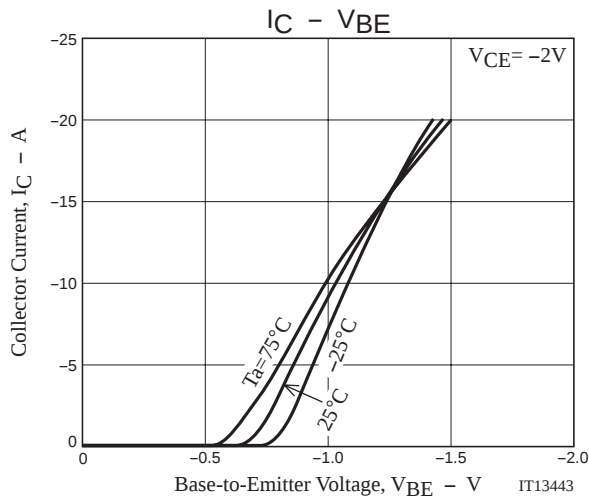
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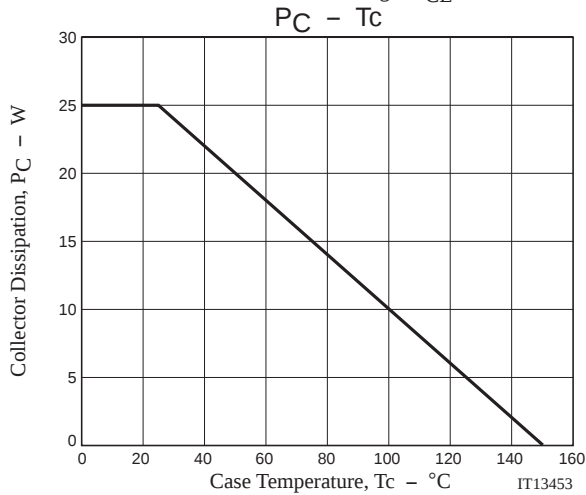
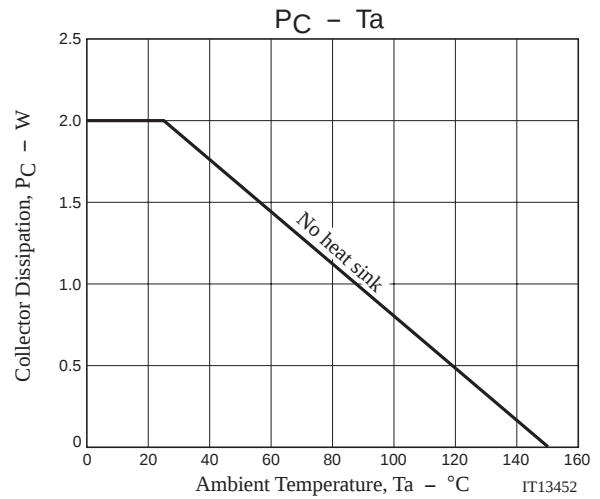
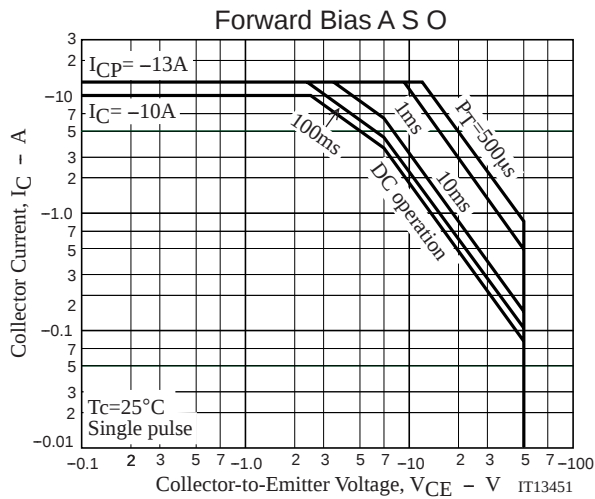
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### Switching Time Test Circuit







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