

**2SB1131****Strobe, High-Current Switching Applications****Applications**

- Strobes, power supplies, relay drivers, lamp drivers.

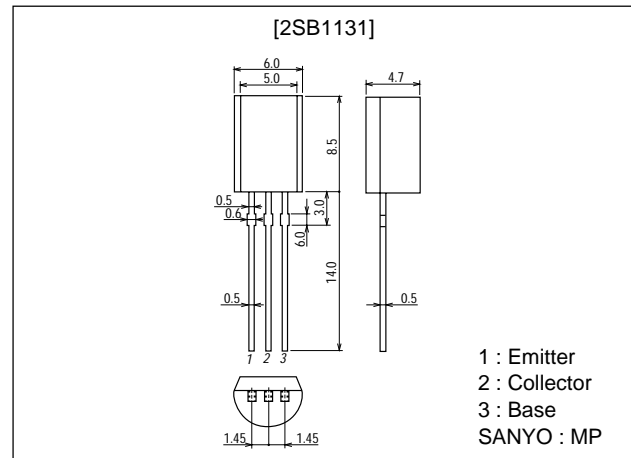
**Features**

- Adoption of FBET, MBIT processes.
- Low saturation voltage.
- Large current capacity.
- Fast switching time.

**Package Dimensions**

unit:mm

2006B

**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 | $V_{CE0}$ |            | -20         | V                |
| Emitter-to-Base Voltage      | $V_{EB0}$ |            | -5          | V                |
| Collector Current            | $I_C$     |            | -5          | A                |
| Collector Current (Pulse)    | $I_{CP}$  |            | -8          | A                |
| Collector Dissipation        | $P_C$     |            | 1           | 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 | $I_{CBO}$ | $V_{CB}=-20\text{V}, I_E=0$            |         |     | -500 | nA   |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=-4\text{V}, I_C=0$             |         |     | -500 | nA   |
| DC Current Gain          | $h_{FE1}$ | $V_{CE}=-2\text{V}, I_C=-500\text{mA}$ | 100*    |     | 400* |      |
|                          | $h_{FE2}$ | $V_{CE}=-2\text{V}, I_C=-4\text{A}$    | 60      |     |      |      |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE}=-5\text{V}, I_C=-200\text{mA}$ |         | 320 |      | MHz  |

\* : The 2SB1131 is classified by 500mA  $h_{FE}$  as follows :

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| Rank     | R          | S          | T          |
|----------|------------|------------|------------|
| $h_{FE}$ | 100 to 200 | 140 to 280 | 200 to 400 |

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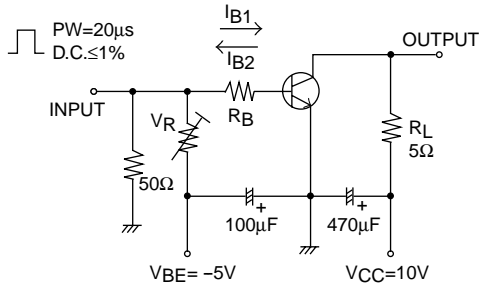
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# 2SB1131

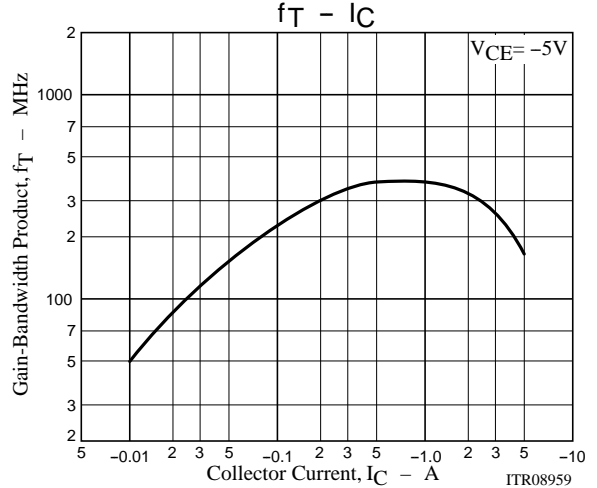
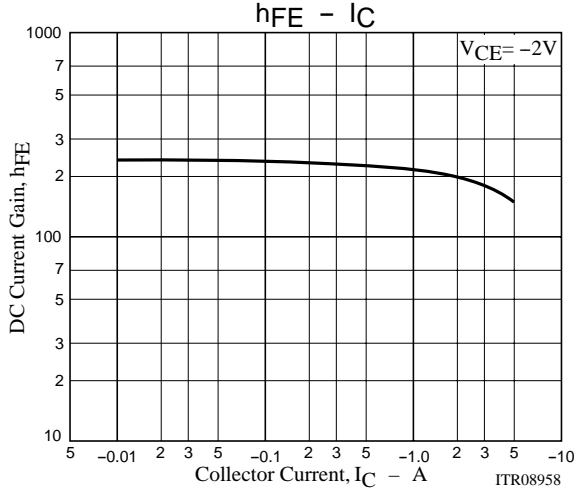
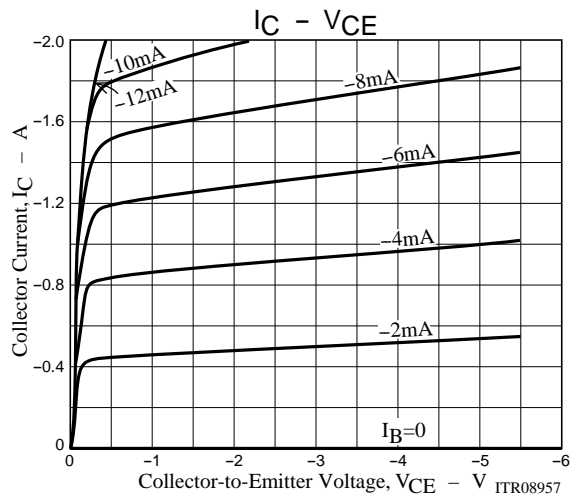
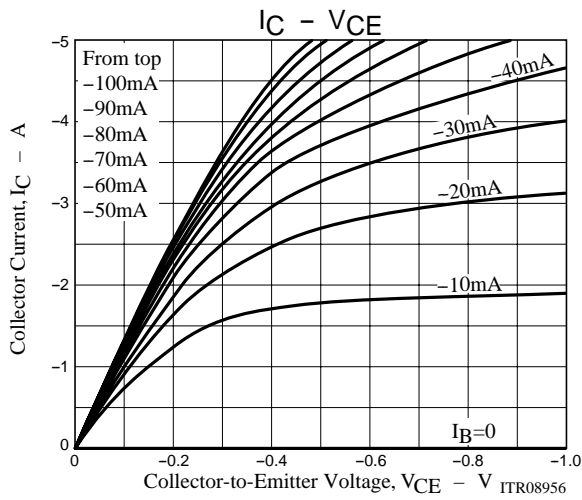
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| Parameter                               | Symbol        | Conditions                      | Ratings |      |      | Unit |
|---|---------------|---------------------------------|---------|------|------|------|
|   |               |                                 | min     | typ  | max  |      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = -3A, I_B = -60mA$        |         | -250 | -500 | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = -3A, I_B = -60mA$        |         | -1.0 | -1.3 | V    |
| Output Capacitance                      | $C_{ob}$      | $V_{CB} = -10V, f = 1MHz$       |         | 60   |      | pF   |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C = (-)10\mu A, I_E = 0$     | -25     |      |      | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C = (-)1mA, R_{BE} = \infty$ | -20     |      |      | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E = (-)10\mu A, I_C = 0$     | -5      |      |      | V    |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit.     |         | 40   |      | ns   |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit.     |         | 200  |      | ns   |
| Fall Time                               | $t_f$         | See specified Test Circuit.     |         | 10   |      | ns   |

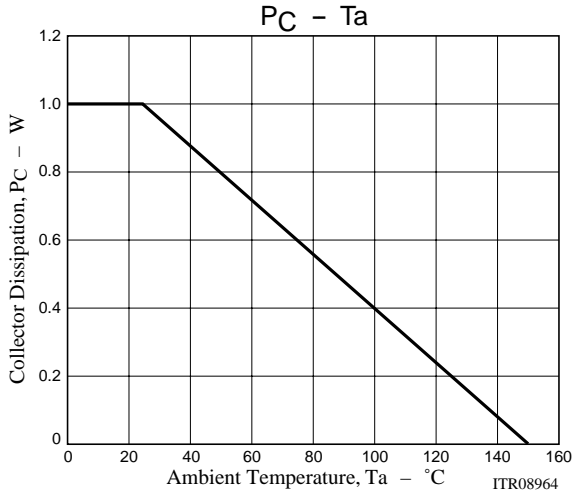
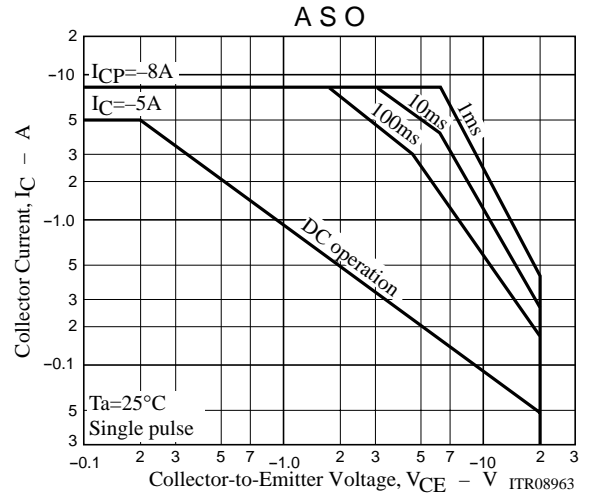
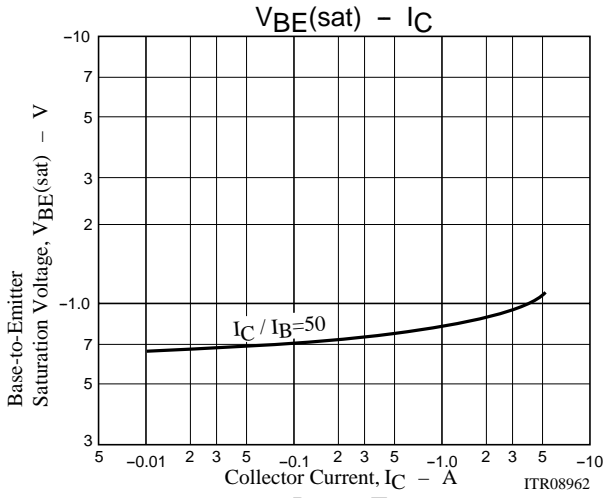
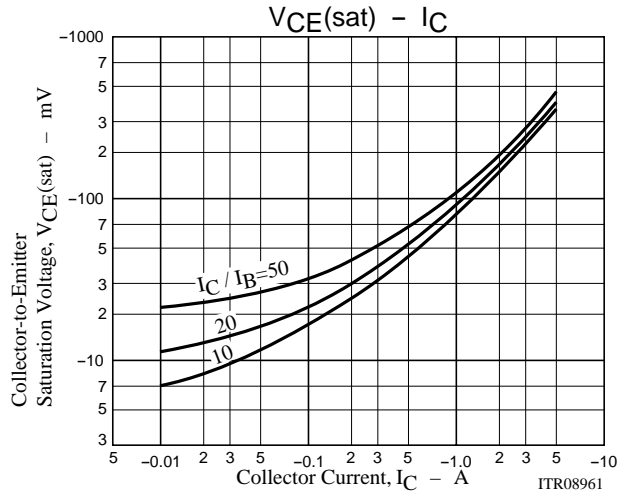
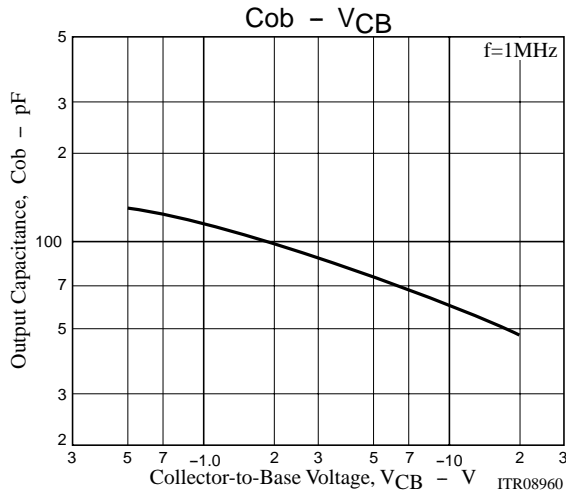
## Switching Time Test Circuit



$$I_C = 10I_{B1} = -10I_{B2} = 2A$$



# 2SB1131



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