



## 2SB829/2SD1065

### 50V/15A Switching Applications

#### Applications

- Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

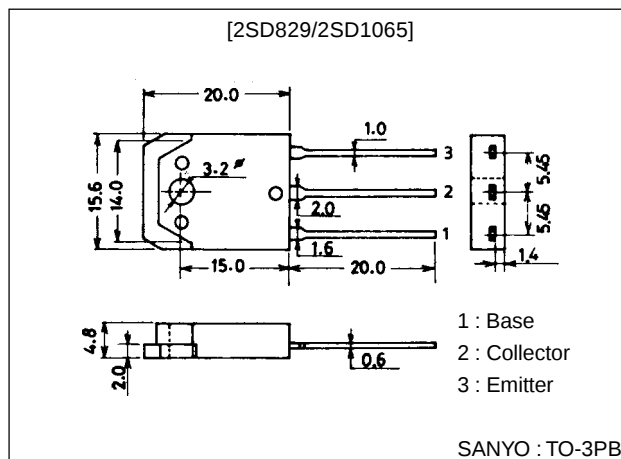
#### Features

- Low-saturation collector-to-emitter voltage :  
 $V_{CE(sat)} = -0.5V$  max.
- Wide ASO leading to high resistance to breakdown.

#### Package Dimensions

unit:mm

2022A



() : 2SB829

#### Specifications

##### Absolute Maximum Ratings at $T_a = 25^\circ C$

| Parameter                    | Symbol    | Conditions         | Ratings     | Unit       |
|------------------------------|-----------|--------------------|-------------|------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |                    | (-)-60      | V          |
| Collector-to-Emitter Voltage | $V_{CEO}$ |                    | (-)-50      | V          |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                    | (-)-6       | V          |
| Collector Current            | $I_C$     |                    | (-)-15      | A          |
| Collector Current (Pulse)    | $I_{CP}$  |                    | (-)-20      | A          |
| Collector Dissipation        | $P_C$     | $T_c = 25^\circ C$ | 90          | W          |
| Junction Temperature         | $T_J$     |                    | 150         | $^\circ C$ |
| Storage Temperature          | $T_{stg}$ |                    | -55 to +150 | $^\circ C$ |

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

| Parameter                               | Symbol        | Conditions                    | Ratings |          |         | Unit |
|-----------------------------------------|---------------|-------------------------------|---------|----------|---------|------|
|                                         |               |                               | min     | typ      | max     |      |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB} = (-)40V, I_E = 0$    |         |          | (-)-0.1 | mA   |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB} = (-)4V, I_C = 0$     |         |          | (-)-0.1 | mA   |
| DC Current Gain                         | $h_{FE1}$     | $V_{CE} = (-)2V, I_C = (-)1A$ | 70*     |          | 280*    |      |
|                                         | $h_{FE2}$     | $V_{CE} = (-)2V, I_C = (-)8A$ | 30      |          |         |      |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE} = (-)5V, I_C = (-)1A$ |         | 20       |         | MHz  |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = (-)8A, I_B = (-)0.4A$  |         | (-)-0.26 | (-)-0.5 | V    |
|                                         |               |                               |         | 0.18     | 0.4     | V    |

\* : The 2SB829/2SD1065 are classified by 1A  $h_{FE}$  as follows :

|    |   |     |     |   |     |     |   |     |
|----|---|-----|-----|---|-----|-----|---|-----|
| 70 | Q | 140 | 100 | R | 200 | 140 | S | 280 |
|----|---|-----|-----|---|-----|-----|---|-----|

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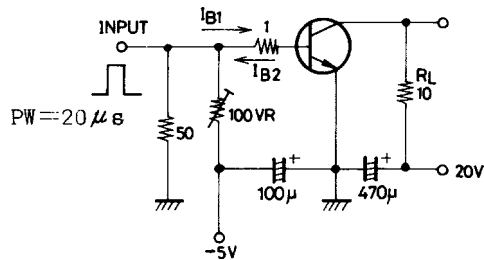
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

91098HA (KT)/10996TS (KOTO) 8-3880/4017KI/3145KI No.825-1/4

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| Parameter                              | Symbol        | Conditions                      | Ratings |       |     | Unit    |
|----------------------------------------|---------------|---------------------------------|---------|-------|-----|---------|
|                                        |               |                                 | min     | typ   | max |         |
| Collector-to-Base Breakdown Voltage    | $V_{(BR)CBO}$ | $I_C = (-)1mA, I_E = 0$         | (-)60   |       |     | V       |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = (-)1mA, R_{BE} = \infty$ | (-)50   |       |     | V       |
| Emitter-to-Base Breakdown Voltage      | $V_{(BR)EBO}$ | $I_E = (-)1mA, I_C = 0$         | (-)6    |       |     | V       |
| Turn-ON Time                           | $t_{on}$      | See specified Test Circuit      |         | 0.2   |     | $\mu s$ |
| Fall Time                              | $t_f$         | See specified Test Circuit      |         | (0.5) |     | $\mu s$ |
|                                        |               |                                 |         | 1.0   |     | $\mu s$ |
| Storage Time                           | $t_{stg}$     | See specified Test Circuit      |         | 0.1   |     | $\mu s$ |

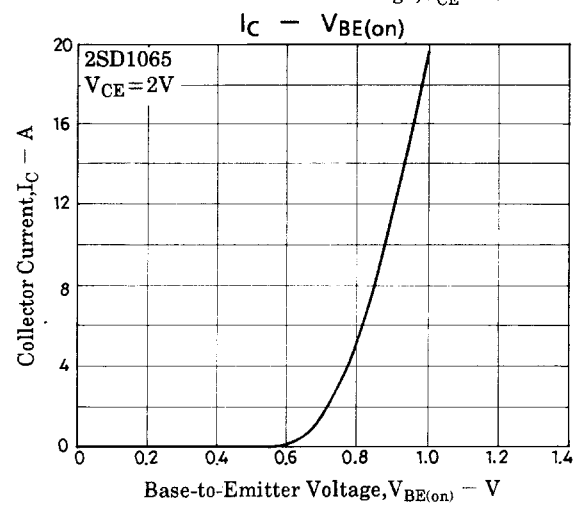
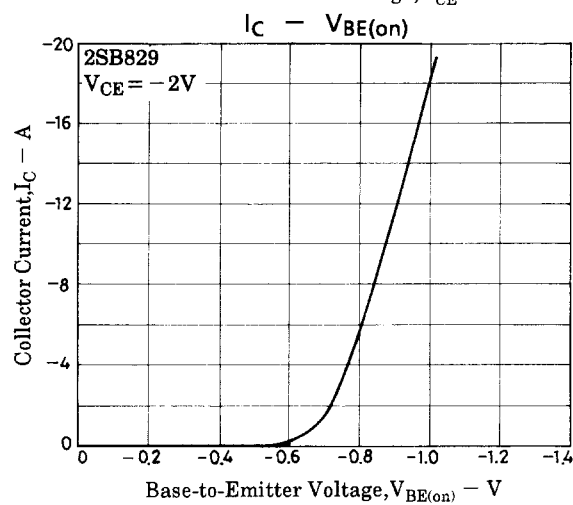
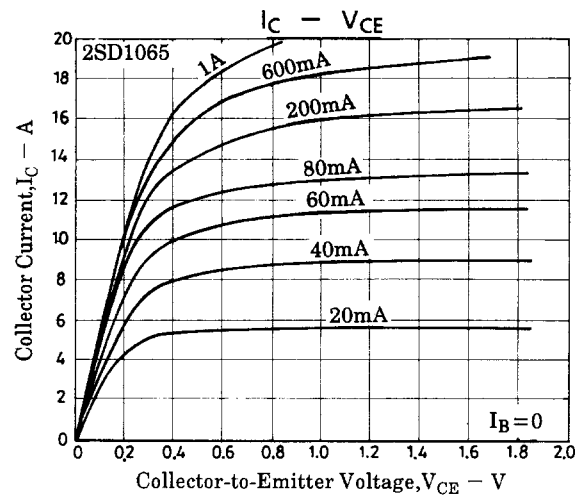
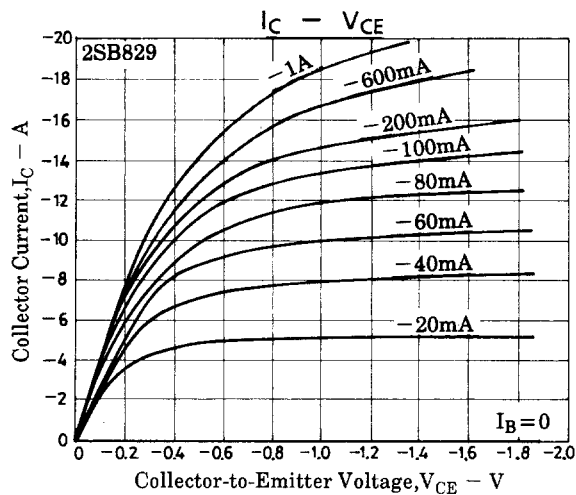
### Switching Time Test Circuit



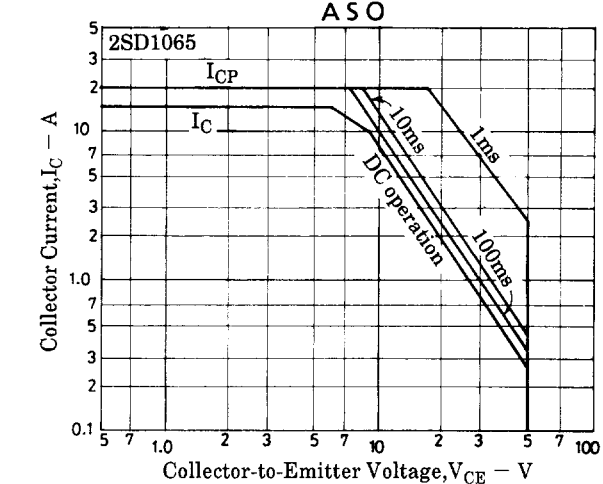
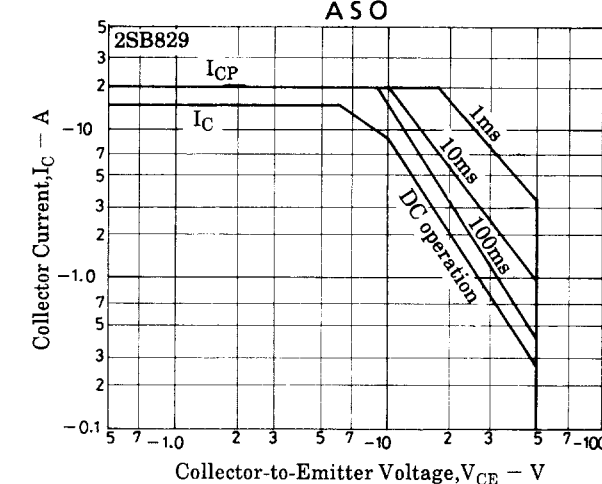
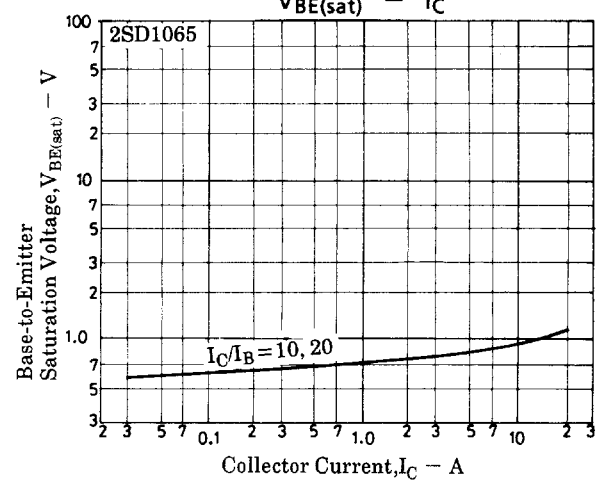
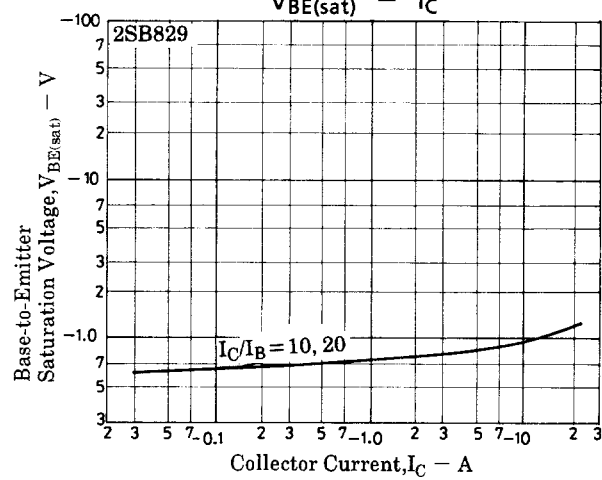
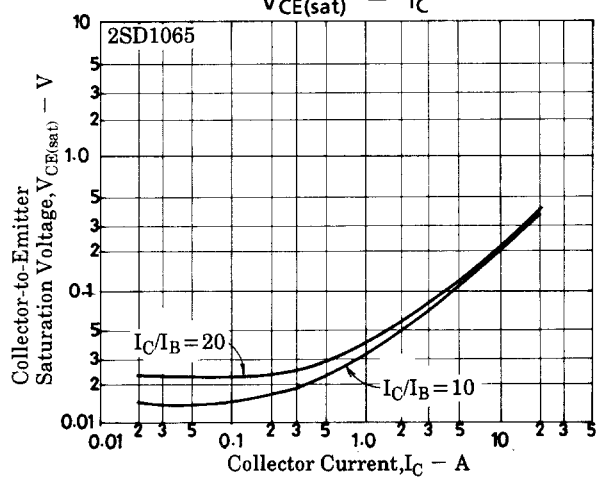
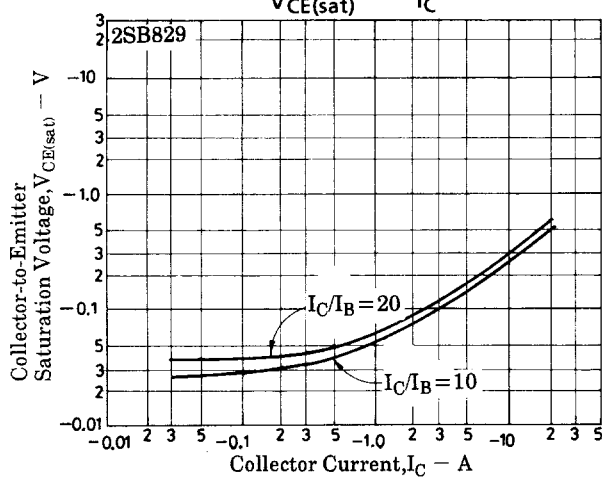
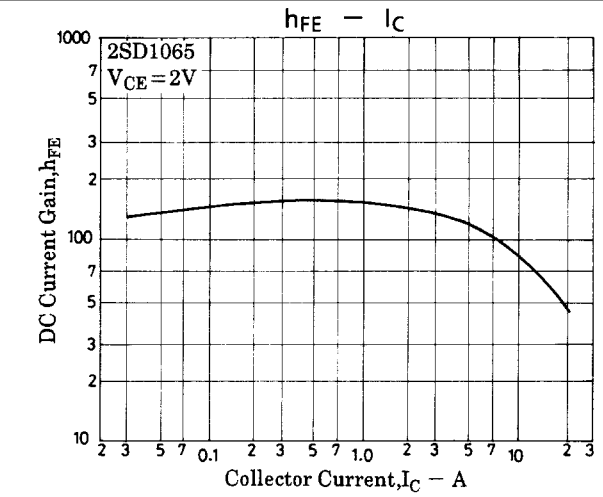
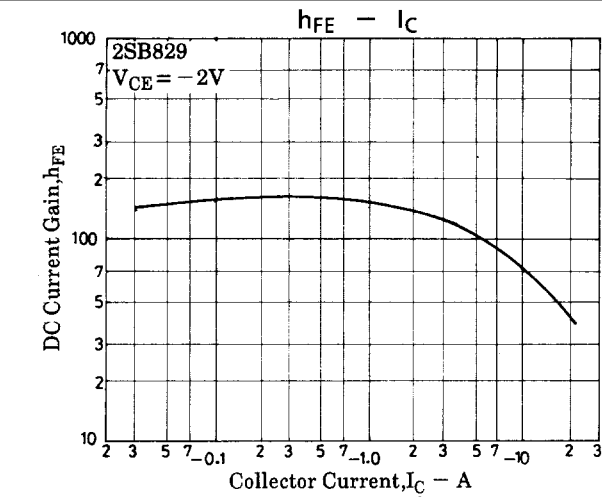
$$10I_{B1} = -10I_{B2} = I_C = 2A$$

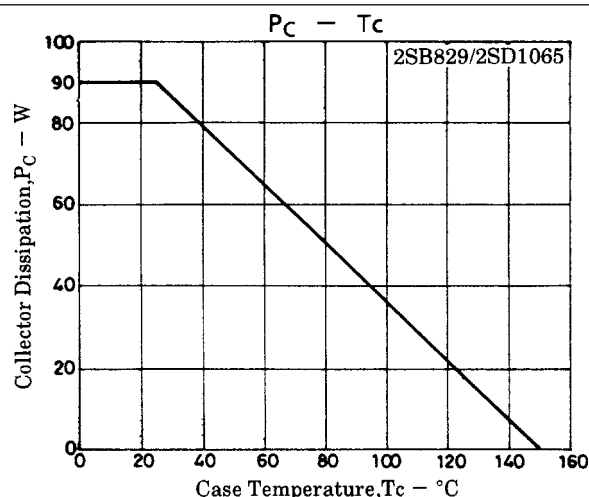
(For PNP, the polarity is reversed.)

Unit (resistance :  $\Omega$ , capacitance: F)



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