



# 2SB828/2SD1064

## 50V/12A Switching Applications

### Applications

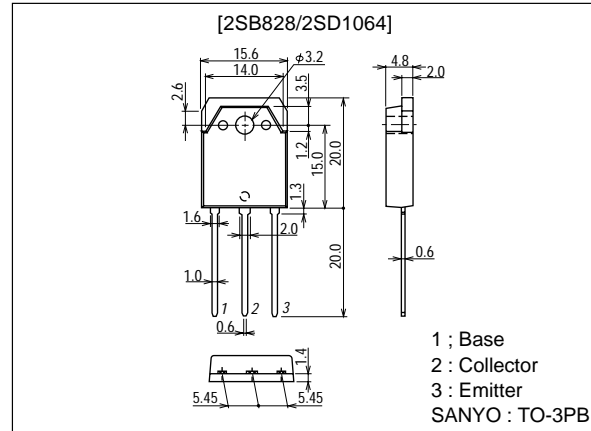
- Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

### Features

- Low-saturation collector-to-emitter voltage :  
 $V_{CE(sat)} = -0.5V$  (PNP),  $0.4V$  (NPN) max.
- Wide ASO leading to high resistance to breakdown.

### Package Dimensions

unit:mm  
2022A



( ) : 2SB828

### Specifications

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

| 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            | $I_C$     |                        | (-)12       | A                |
| Collector Current (Pulse)    | $I_{CP}$  |                        | (-)17       | A                |
| Collector Dissipation        | $P_C$     | $T_c=25^\circ\text{C}$ | 80          | 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                | $I_{CBO}$     | $V_{CB} = (-)40V, I_E = 0$    |         |     | (-)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*   |      |
|   | $h_{FE2}$     | $V_{CE} = (-)2V, I_C = (-)5A$ | 30      |     |        |      |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE} = (-)5V, I_C = (-)1A$ |         | 10  |        | MHz  |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = (-)6A, I_B = (-)0.3A$  |         |     | 0.4    | V    |
|   |               |                               |         |     | (-)0.5 | V    |

\* : The 2SB828/2SD1064 are classified by 1A  $h_{FE}$  as follows :

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| Rank     | Q         | R          | S          |
|----------|-----------|------------|------------|
| $h_{FE}$ | 70 to 140 | 100 to 200 | 140 to 280 |

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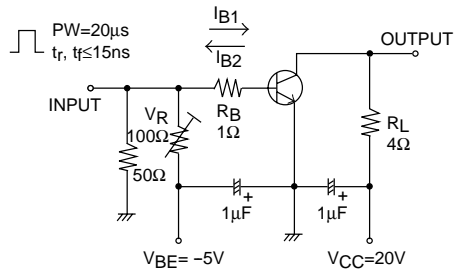
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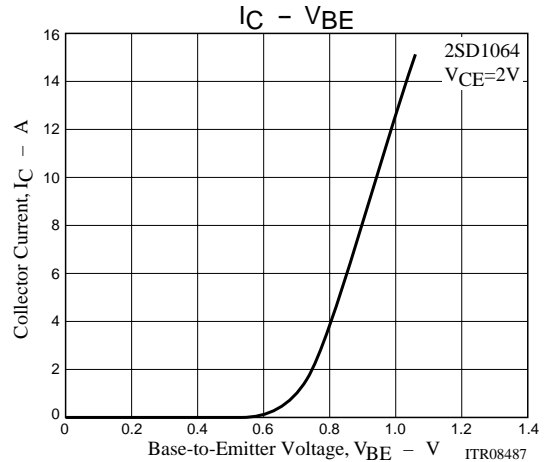
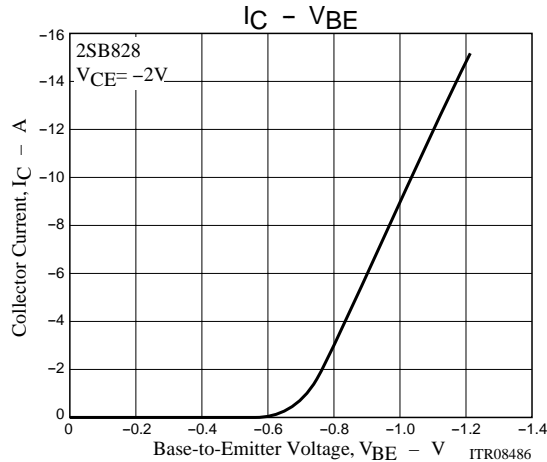
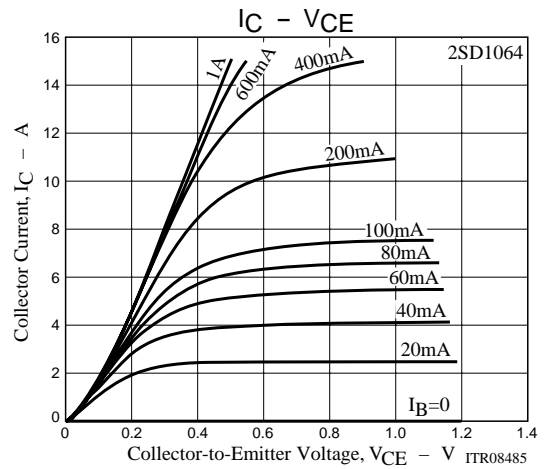
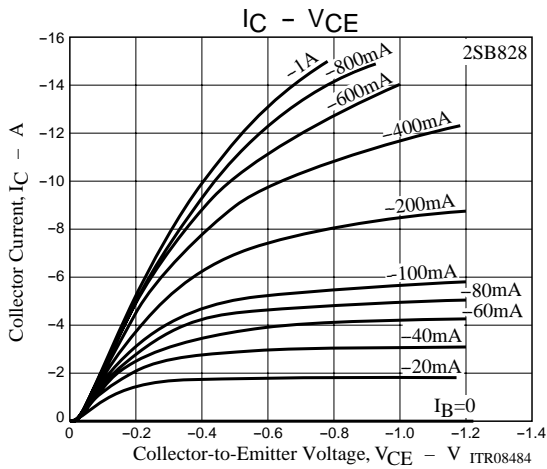
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| Parameter                              | Symbol        | Conditions                  | Ratings |       |     | Unit    |
|--|---------------|-----------------------------|---------|-------|-----|---------|
|  |               |                             | 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) |     | $\mu s$ |
|  |               |                             |         | 0.1   |     | $\mu s$ |
| Fall Time                              | $t_f$         | See specified Test Circuit  |         | (0.4) |     | $\mu s$ |
|  |               |                             |         | 1.2   |     | $\mu s$ |
| Storage Time                           | $t_{stg}$     | See specified Test Circuit  |         | (0.1) |     | $\mu s$ |
|  |               |                             |         | 0.05  |     | $\mu s$ |

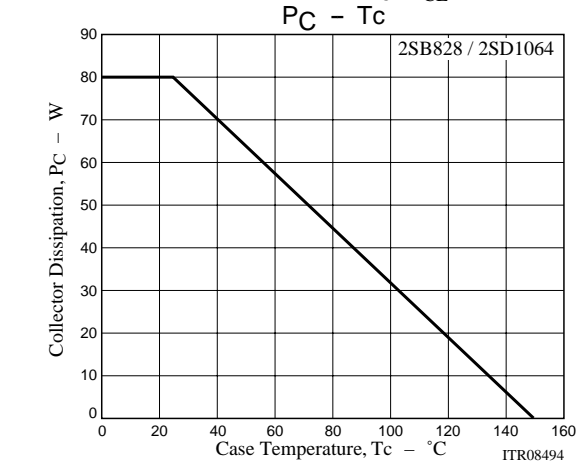
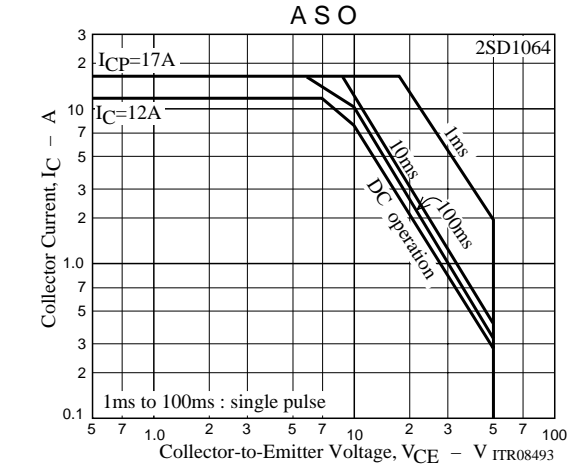
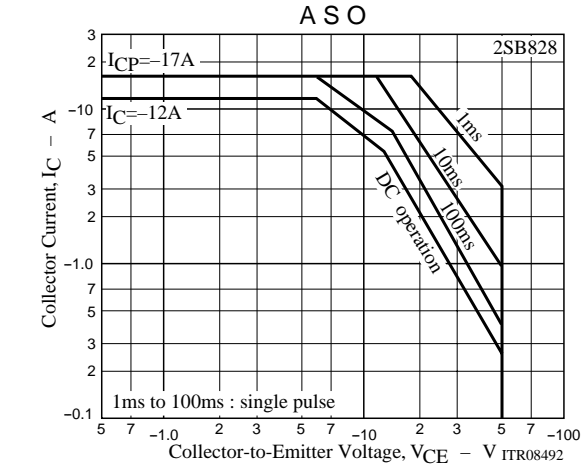
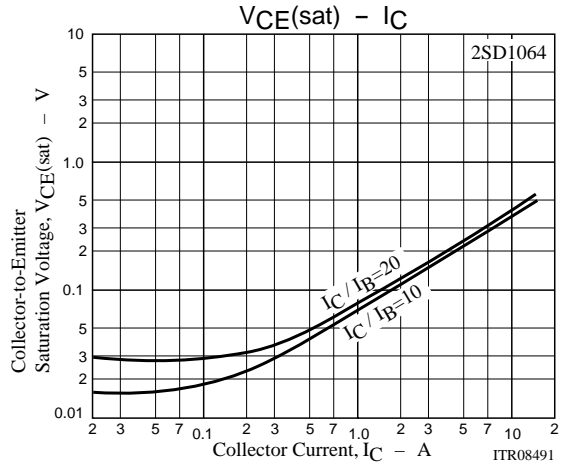
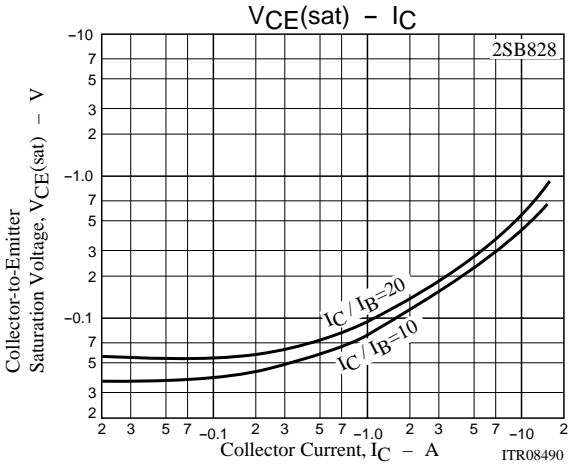
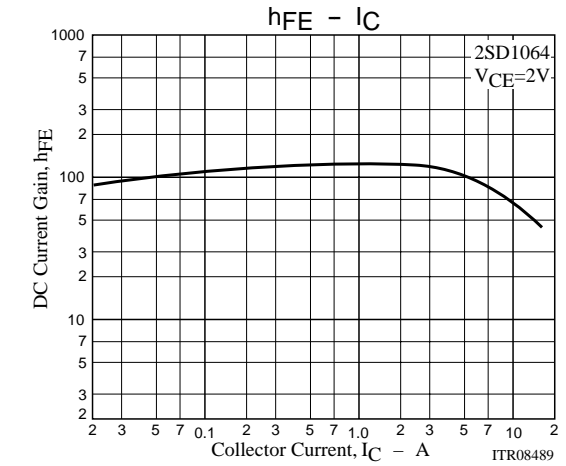
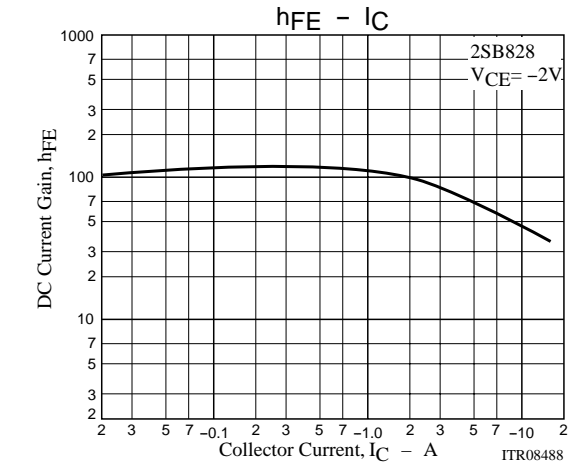
## Switching Time Test Circuit



$I_C = 10I_{B1} = -10I_{B2} = 5A$   
(For PNP, the polarity is reversed.)



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