



## 2SB817/2SD1047

### 140V/12A AF 60W Output Applications

#### Features

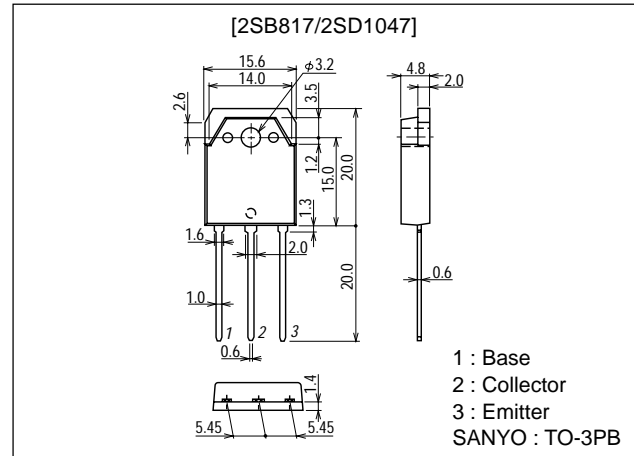
- Capable of being mounted easily because of one-point fixing type plastic molded package (Interchangeable with TO-3).
- Wide ASO because of on-chip ballast resistance.
- Good dependence of  $f_T$  on current and excellent high frequency response.

The descriptions in parentheses are for the 2SB817 only :  
other descriptions than those in parentheses are common to the 2SB817 and 2SD1047.

#### Package Dimensions

unit:mm

2022A



#### Specifications

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

| Parameter                    | Symbol    | Conditions             | Ratings     | Unit             |
|------------------------------|-----------|------------------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |                        | (-)160      | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |                        | (-)140      | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                        | (-)6        | V                |
| Collector Current            | $I_C$     |                        | (-)12       | A                |
| Collector Current (Pulse)    | $I_{CP}$  |                        | (-)15       | A                |
| Collector Dissipation        | $P_C$     | $T_C=25^\circ\text{C}$ | 100         | W                |
| Junction Temperature         | $T_j$     |                        | 150         | $^\circ\text{C}$ |
| Storage Temperature          | $T_{stg}$ |                        | -40 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 | $I_{CBO}$ | $V_{CB}=(-)80\text{V}, I_E=0$           |         |       | (-)0.1 | mA   |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=(-)4\text{V}, I_C=0$            |         |       | (-)0.1 | mA   |
| DC Current Gain          | $h_{FE1}$ | $V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$ | 60*     |       | 200*   |      |
|                          | $h_{FE2}$ | $V_{CE}=(-)5\text{V}, I_C=(-)6\text{A}$ | 20      |       |        |      |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$ |         | 15    |        | MHz  |
| Output Capacitance       | $C_{ob}$  | $V_{CB}=(-)10\text{V}, f=1\text{MHz}$   |         | (300) |        | pF   |
|                          |           |   |         | 210   |        | pF   |

\* : The 2SB817/2SD1047 are classified by 1A  $h_{FE}$  as follows :

| Rank     | D         | E          |
|----------|-----------|------------|
| $h_{FE}$ | 60 to 120 | 100 to 200 |

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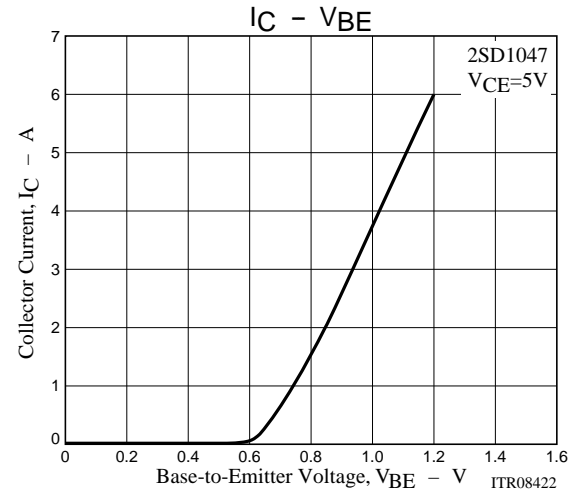
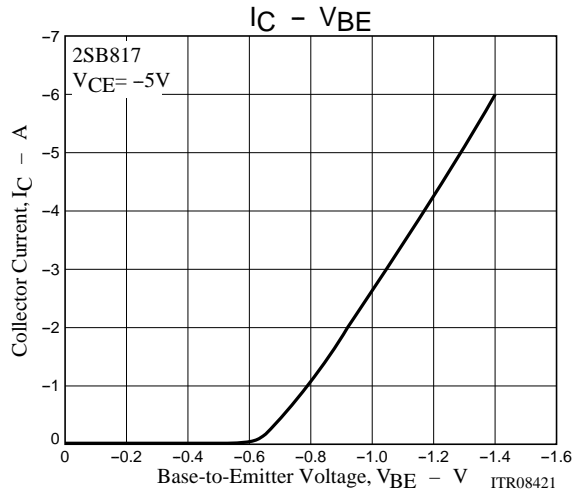
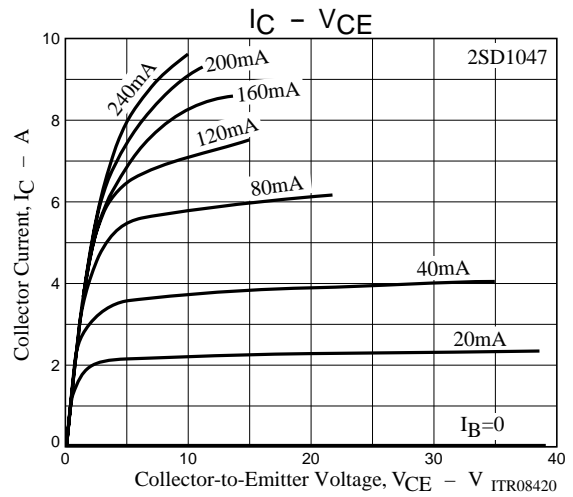
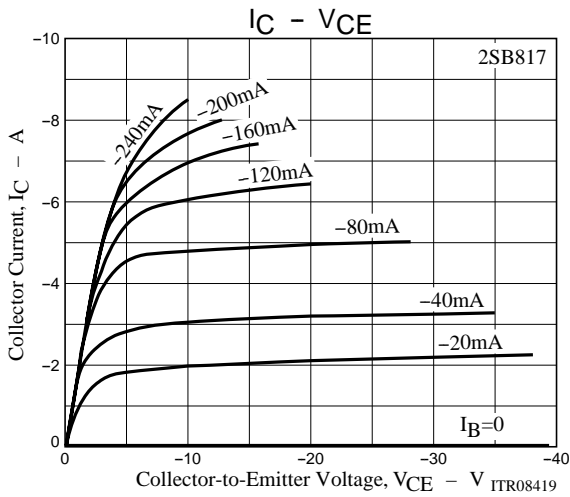
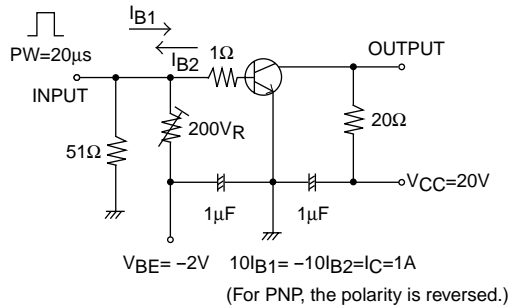
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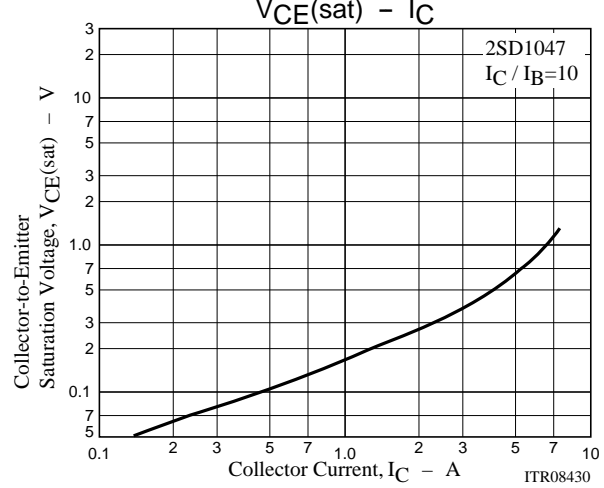
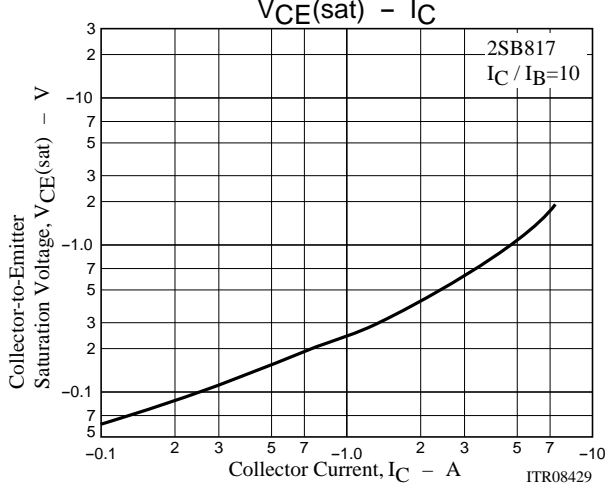
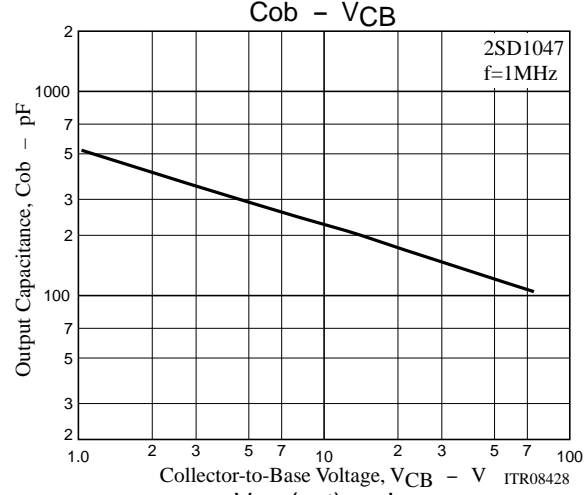
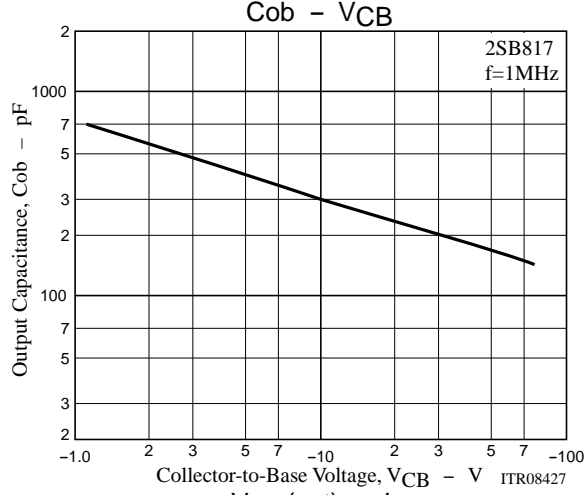
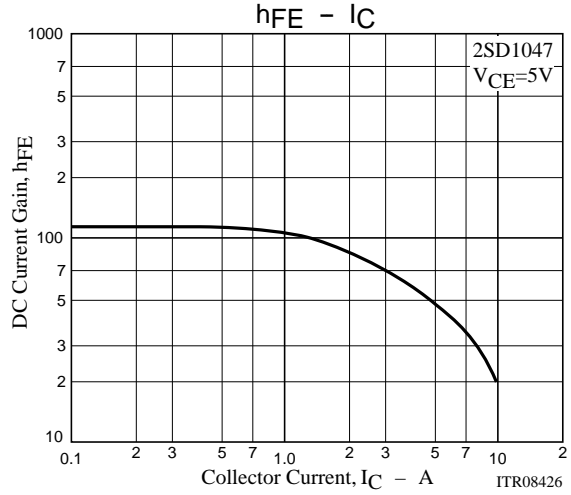
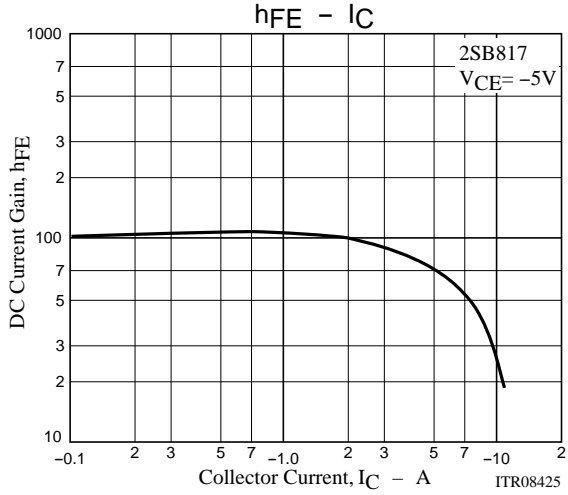
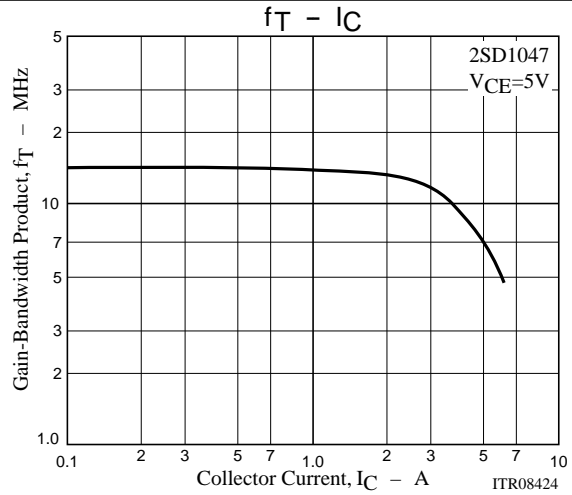
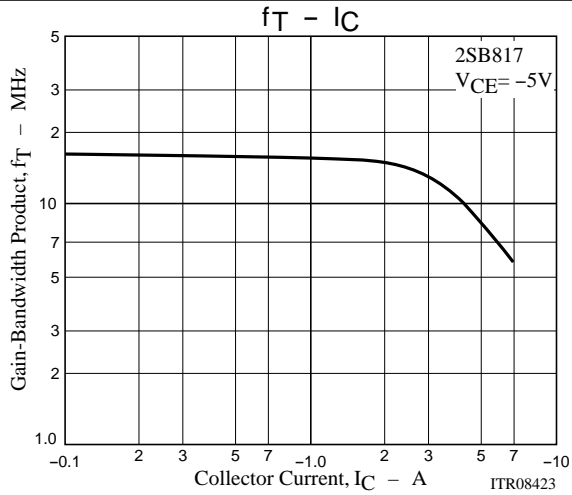
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| Parameter                               | Symbol        | Conditions                   | Ratings |        |     | Unit    |
|---|---------------|------------------------------|---------|--------|-----|---------|
|   |               |                              | min     | typ    | max |         |
| Base-to-Emitter Voltage                 | $V_{BE}$      | $V_{CE}=(-)5V, I_C=(-)1A$    |         |        | 1.5 | V       |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)5A, I_B=(-)0.5A$     |         | 0.6    | 2.5 | V       |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)5mA, I_E=0$          | (-)160  |        |     | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)5mA, R_{BE}=\infty$  | (-)140  |        |     | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)50mA, R_{BE}=\infty$ | (-)140  |        |     | V       |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=(-)5mA, I_C=0$          | (-)6    |        |     | V       |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit   |         | (0.25) |     | $\mu s$ |
|   |               |                              |         | 0.26   |     | $\mu s$ |
| Fall Time                               | $t_f$         | See specified Test Circuit   |         | (0.53) |     | $\mu s$ |
|   |               |                              |         | 0.68   |     | $\mu s$ |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit   |         | (1.61) |     | $\mu s$ |
|   |               |                              |         | 6.88   |     | $\mu s$ |

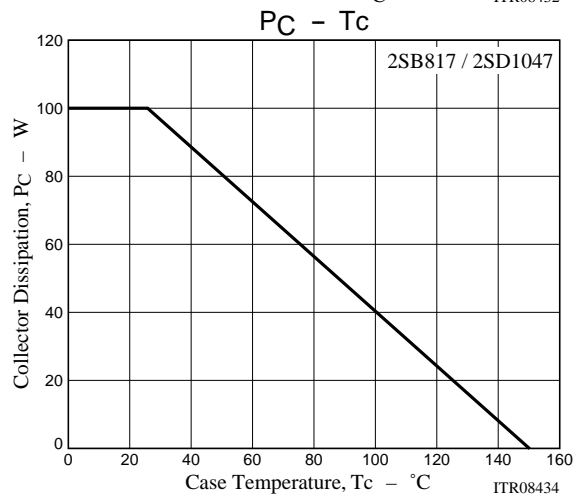
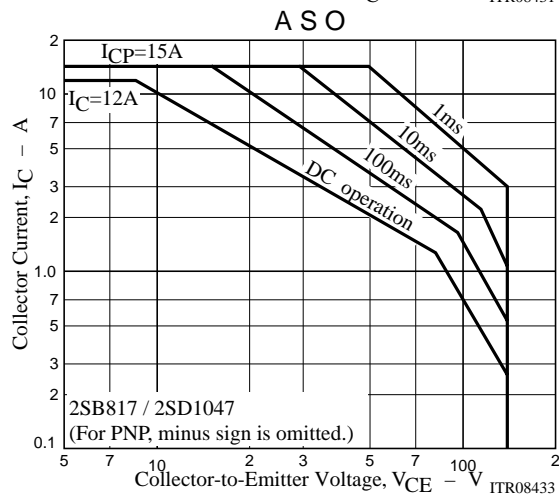
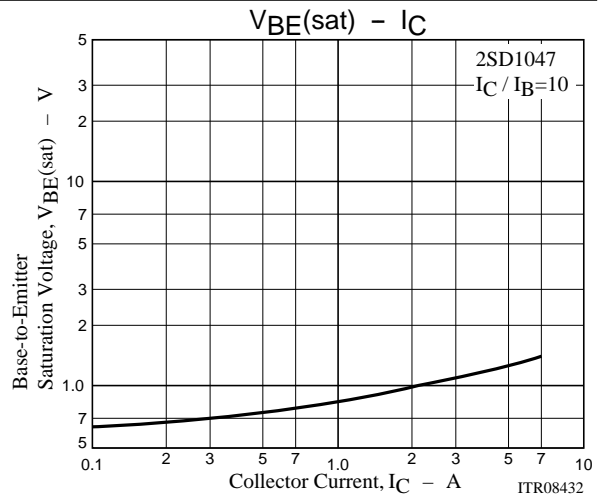
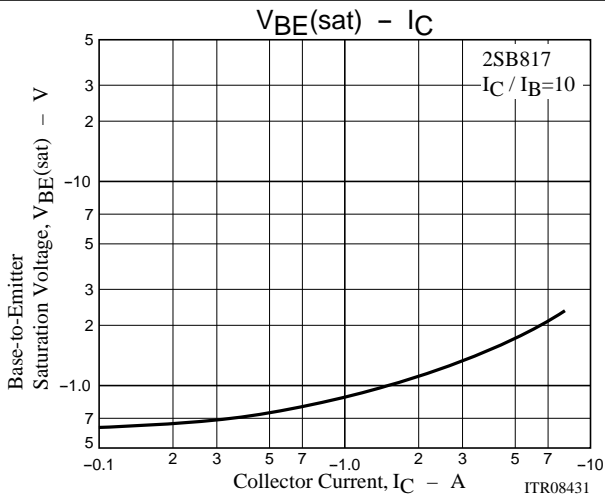
## Switching Time Test Circuit



# 2SB817/2SD1047



## 2SB817/2SD1047



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