



## 2SA1827/2SC4731

### 100V/4A Switching Applications

#### Applications

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

#### Features

- Low collector-to-emitter saturation voltage.
- High Gain-Bandwidth Product.
- Excellent linearity of DC Current Gain.
- Fast switching speed.

( ) : 2SA1827

#### Specifications

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

| Parameter                    | Symbol    | Conditions | Ratings     | Unit             |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CB0}$ |            | (-)120      | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |            | (-)100      | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |            | (-)6        | V                |
| Collector Current            | $I_C$     |            | (-)4        | A                |
| Collector Current (Pulse)    | $I_{CP}$  |            | (-)8        | A                |
| Base Current                 | $I_B$     |            | (-)0.8      | A                |
| Collector Dissipation        | $P_C$     |            | 1.5         | 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 | $I_{CB0}$ | $V_{CB} = (-)100\text{V}, I_E = 0$              |         |       | (-)1 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB} = (-)4\text{V}, I_C = 0$                |         |       | (-)1 | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE1}$ | $V_{CE} = (-)5\text{V}, I_C = (-)500\text{mA}$  | 100*    |       | 400* |               |
|                          | $h_{FE2}$ | $V_{CE} = (-)5\text{V}, I_C = (-)3\text{A}$     | 40      |       |      |               |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE} = (-)10\text{V}, I_C = (-)500\text{mA}$ |         | (130) |      | MHz           |
|                          |           |   |         | 180   |      | MHz           |

\* : The 2SA1827/2SC4731 are classified by 500mA  $h_{FE}$  as follows :

|     |   |     |     |   |     |     |   |     |
|-----|---|-----|-----|---|-----|-----|---|-----|
| 100 | R | 200 | 140 | S | 280 | 200 | T | 400 |
|-----|---|-----|-----|---|-----|-----|---|-----|

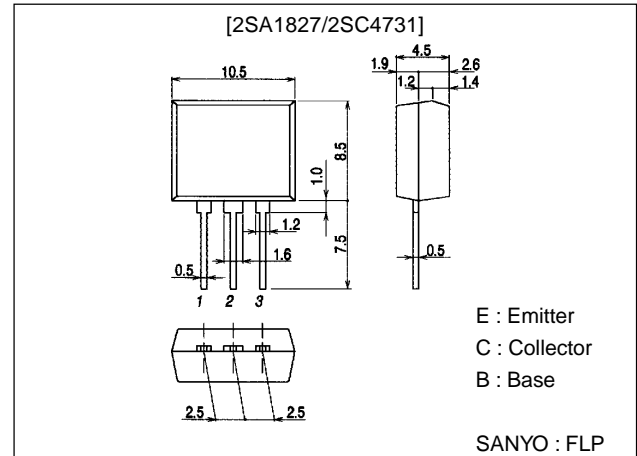
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#### Package Dimensions

unit:mm

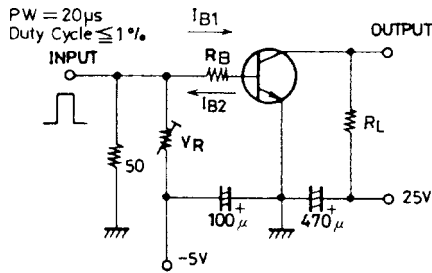
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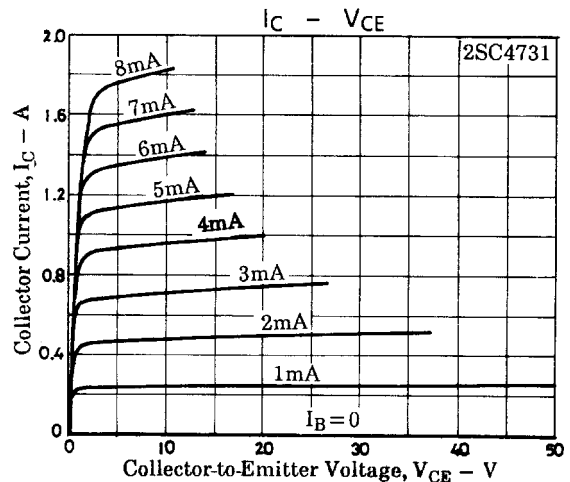
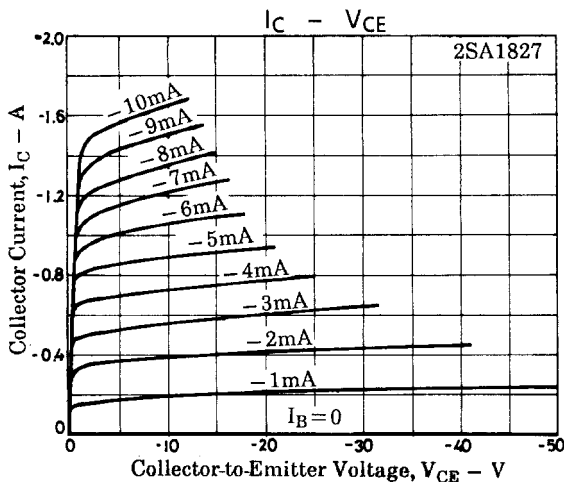
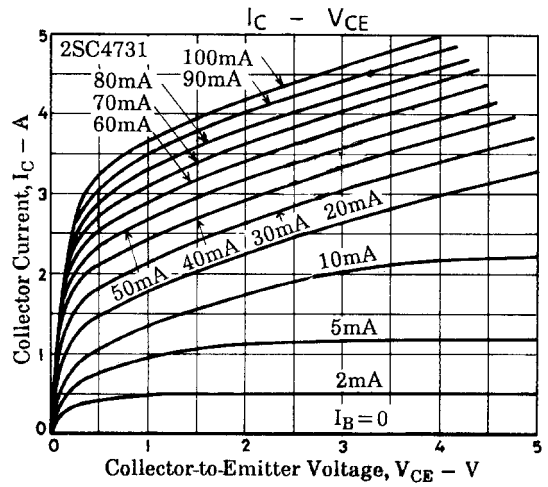
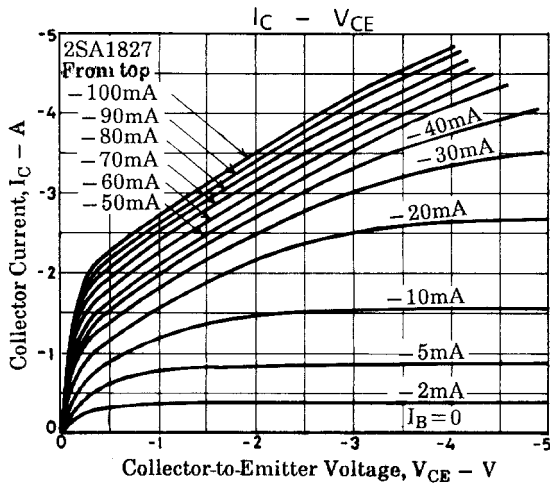
# 2SA1827/2SC4731

| Parameter                               | Symbol        | Conditions                  | Ratings |        |        | Unit |
|---|---------------|-----------------------------|---------|--------|--------|------|
|   |               |                             | min     | typ    | max    |      |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=(-)10V, f=1MHz$     |         | (65)40 |        | pF   |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)2A, I_B=(-)0.2A$    |         | (-200) | (-500) | mV   |
|   |               |                             |         | 150    | 400    | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=(-)2A, I_B=(-)0.2A$    |         | (-)0.9 | (-)1.2 | mV   |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)10\mu A, I_E=0$     | (-)120  |        |        | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$ | (-)100  |        |        | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=(-)10\mu A, I_C=0$     | (-)6    |        |        | V    |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit  |         | 100    |        | ns   |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit  |         | (800)  |        | ns   |
|   |               |                             |         | 900    |        | ns   |
| Fall Time                               | $t_f$         | See specified Test Circuit  |         | 50     |        | ns   |

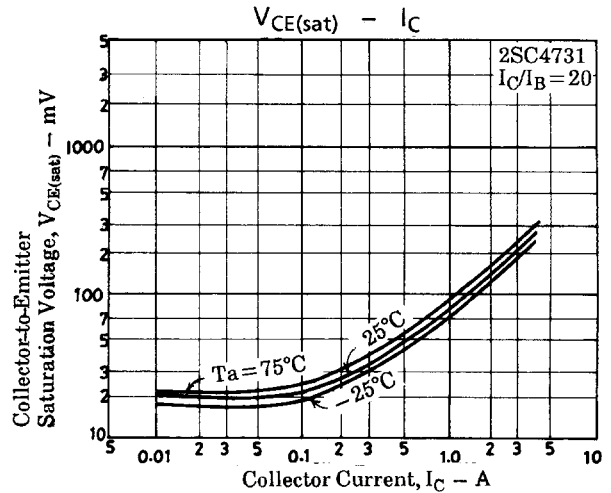
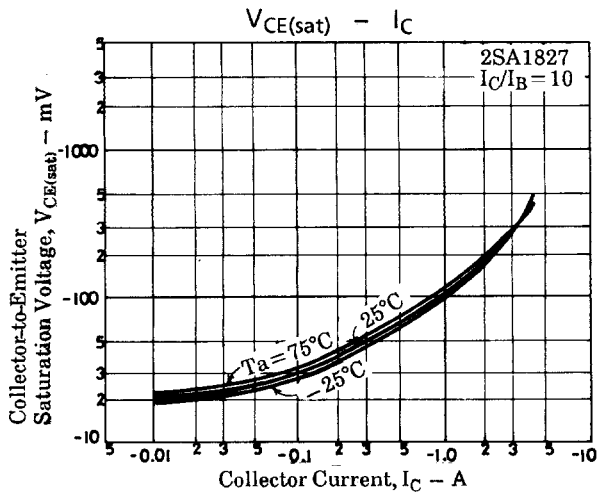
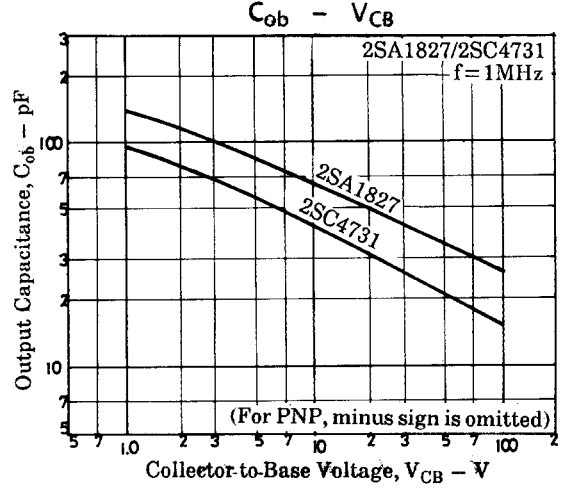
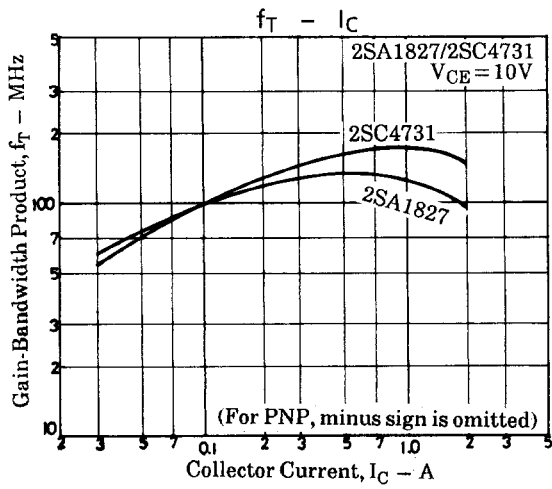
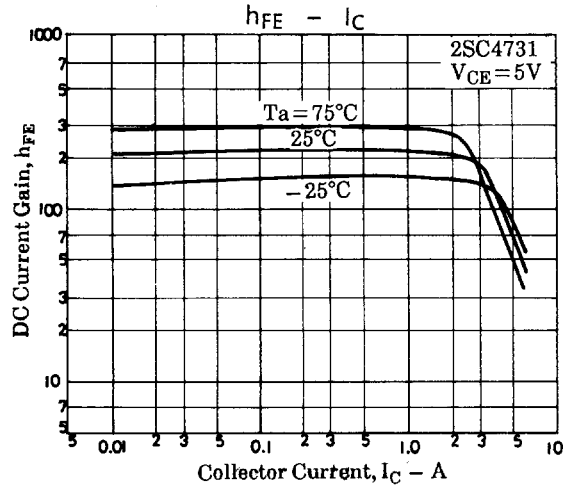
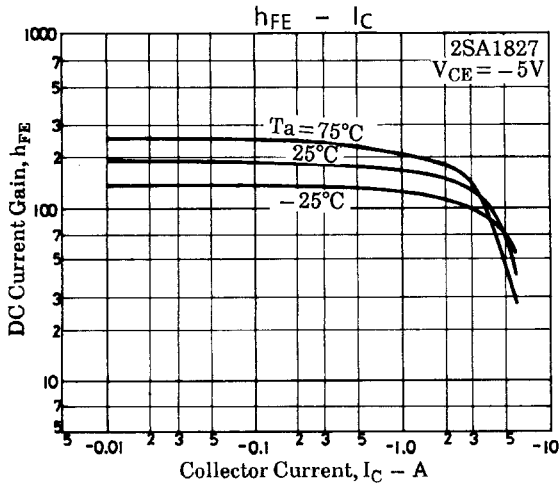
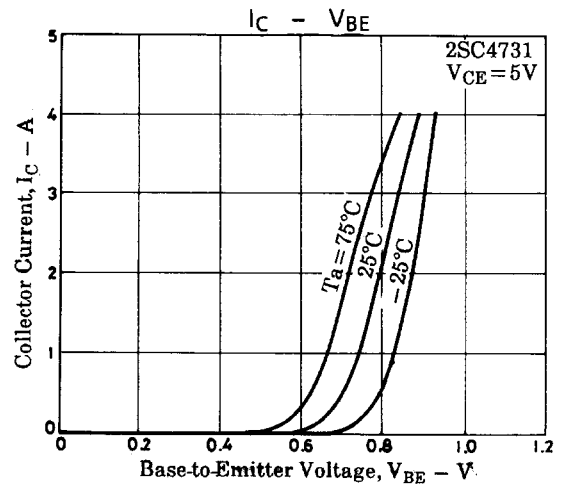
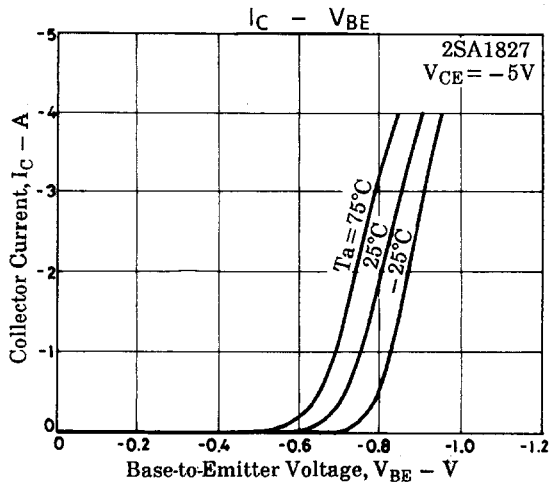
## Switching Time Test Circuit



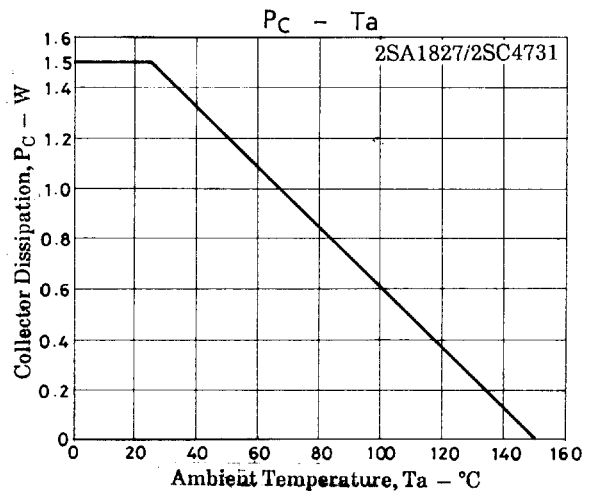
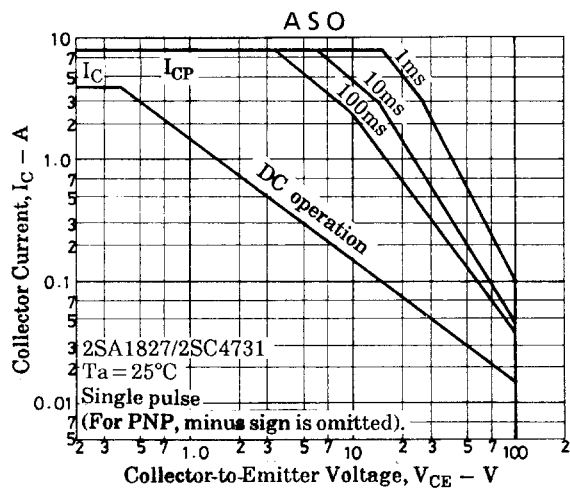
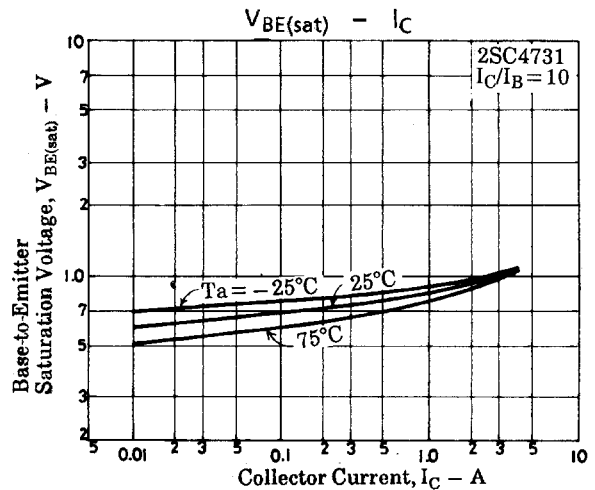
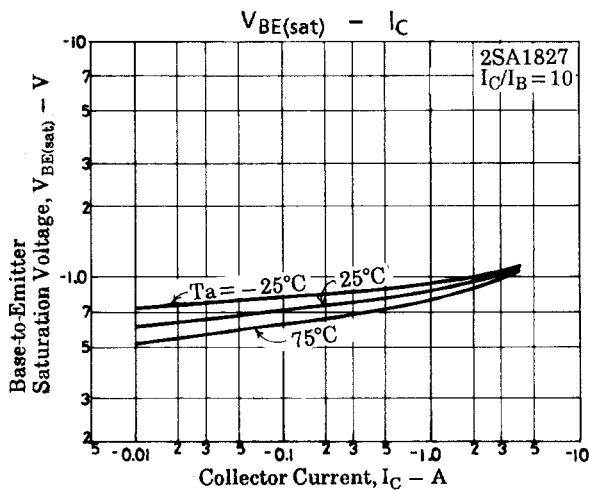
$I_C = 10I_{B1} = -10I_{B2} = 2A$   
 (For PNP, the polarity is reversed).  
 Unit (resistance :  $\Omega$ , capacitance : F)



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