



2SB1216/2SD1816

High-Current Switching Applications

Applications

- Suitable for relay drivers, high-speed inverters, converters, and other general high-current switching applications.

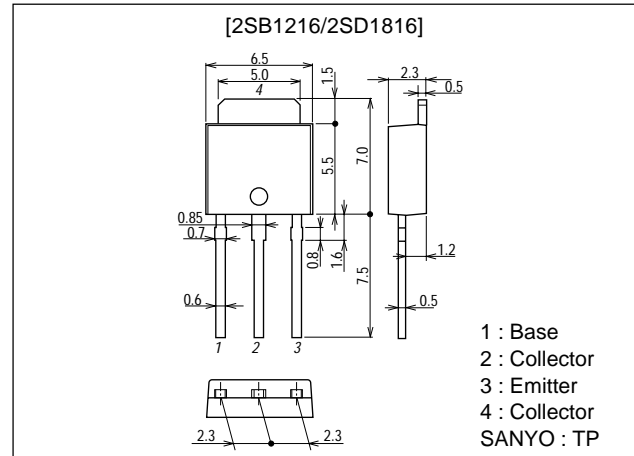
Features

- Low collector-to-emitter saturation voltage.
- Good linearity of h_{FE} .
- Small and slim package facilitating compactness of sets.
- High f_T .
- Fast switching time.

Package Dimensions

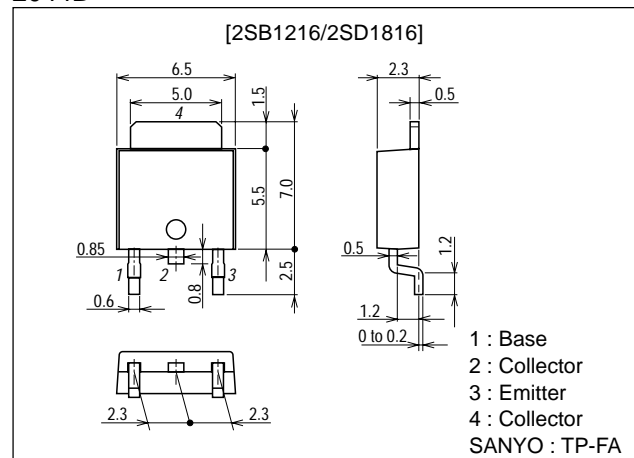
unit:mm

2045B



unit:mm

2044B



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Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------------------|-------------|------------------|
| Collector-to-Base Voltage | V_{CBO} | | (-)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 |
| Collector Dissipation | P_C | | 1 | W |
| | | $T_c=25^\circ\text{C}$ | 20 | W |
| Junction Temperature | T_j | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

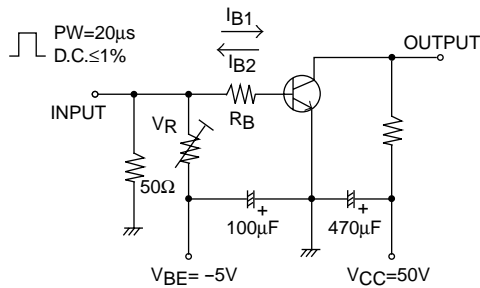
Electrical Characteristics at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|--|---------|--------|--------|---------------|
| | | | min | typ | max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB}=(-)100\text{V}, I_E=0$ | | | (-)1 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=(-)4\text{V}, I_C=0$ | | | (-)1 | μA |
| DC Current Gain | h_{FE1} | $V_{CE}=(-)5\text{V}, I_C=(-)0.5\text{A}$ | 70* | | 400* | |
| | h_{FE2} | $V_{CE}=(-)5\text{V}, I_C=(-)3\text{A}$ | 40 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE}=(-)10\text{V}, I_C=(-)0.5\text{A}$ | | (130) | | MHz |
| | | | | 180 | | MHz |
| Output Capacitance | C_{ob} | $V_{CB}=(-)10\text{V}, f=1\text{MHz}$ | | (65)40 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)2\text{A}, I_B=(-)0.2\text{A}$ | | 150 | 400 | mV |
| | | | | (-200) | (-500) | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=(-)2\text{A}, I_B=(-)0.2\text{A}$ | | (-)0.9 | (-)1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=(-)10\mu\text{A}, I_E=0$ | (-)120 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=(-)1\text{mA}, R_{BE}=\infty$ | (-)100 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=(-)10\mu\text{A}, I_C=0$ | (-)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 |

* : The 2SB1216/2SD1816 are classified by 0.5A h_{FE} as follows :

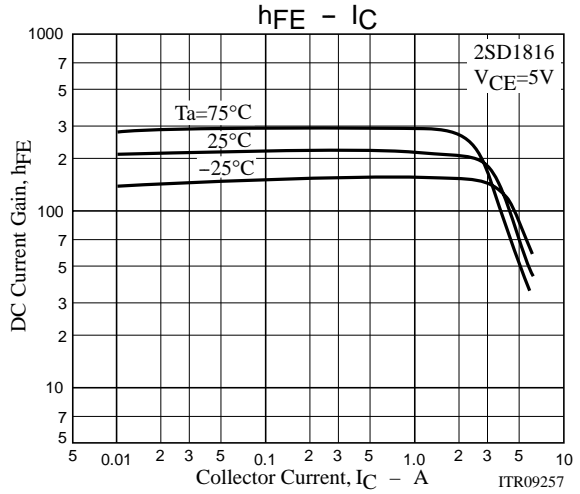
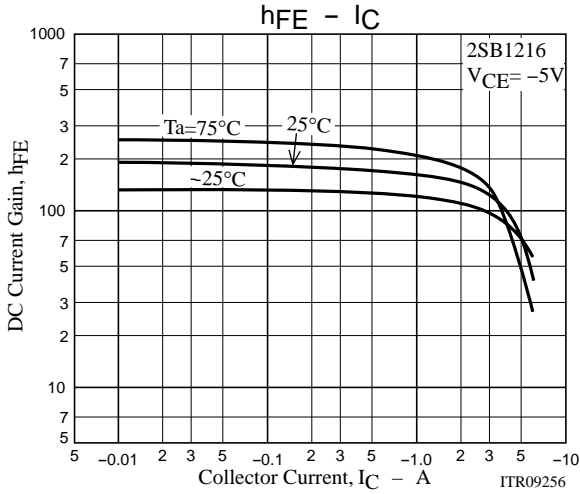
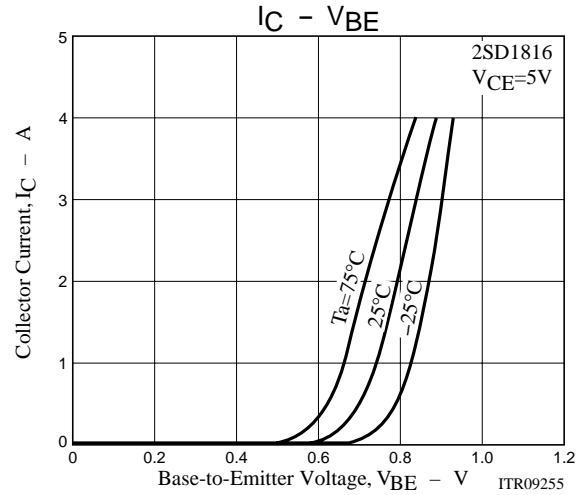
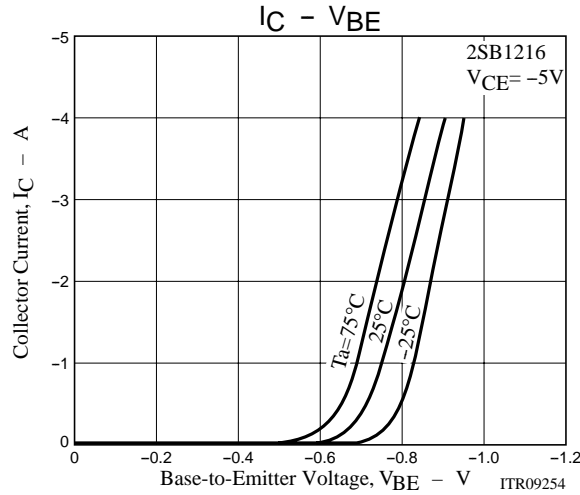
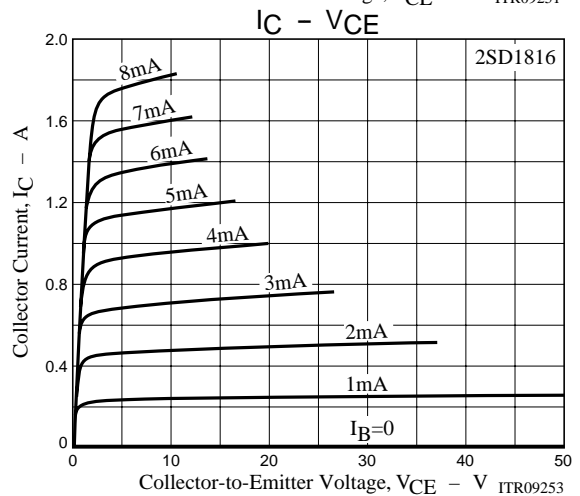
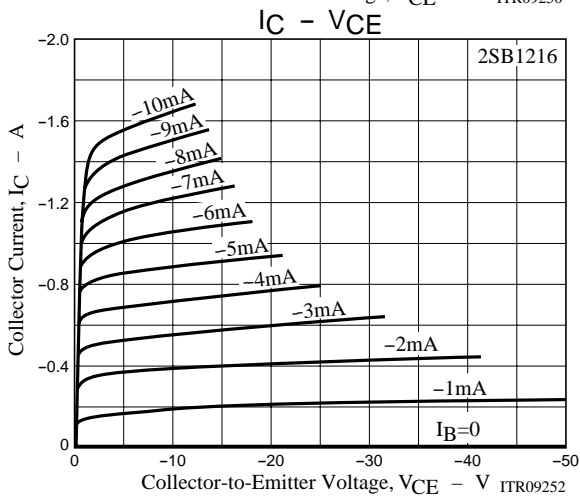
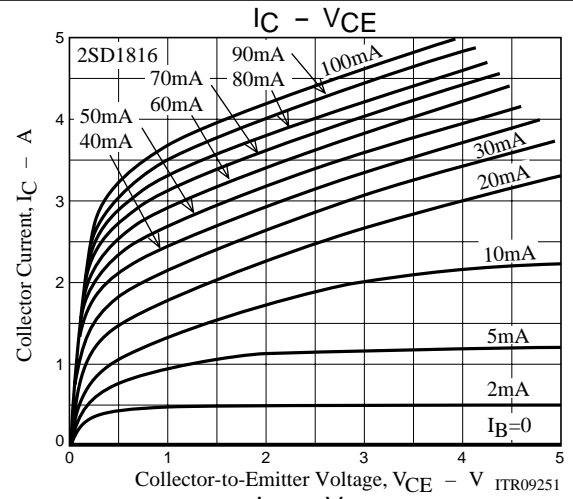
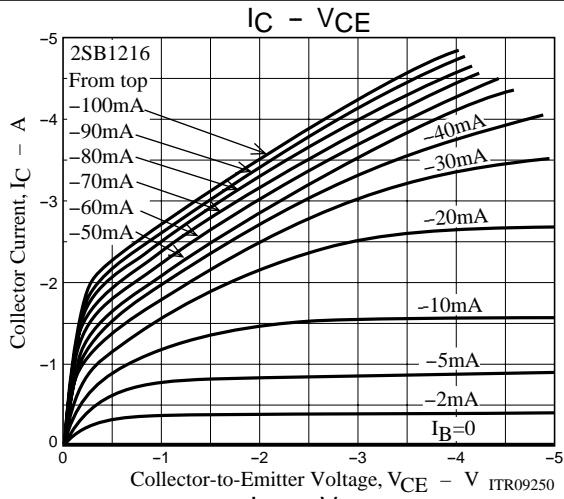
| Rank | Q | R | S | T |
|----------|-----------|------------|------------|------------|
| h_{FE} | 70 to 140 | 100 to 200 | 140 to 280 | 200 to 400 |

Switching Time Test Circuit

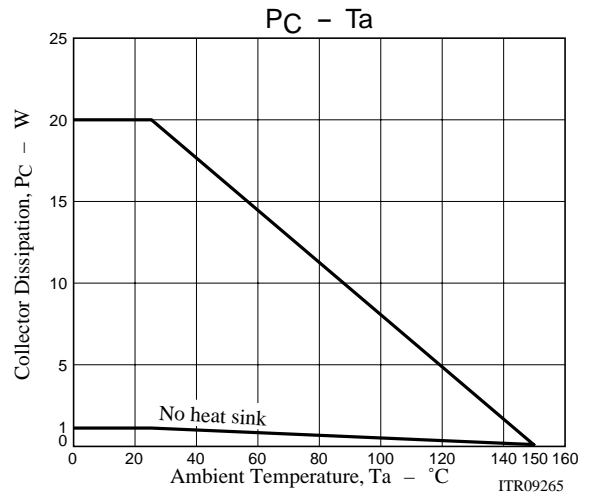
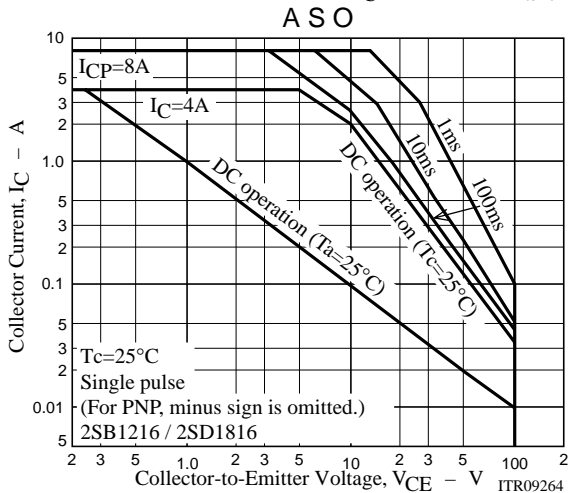
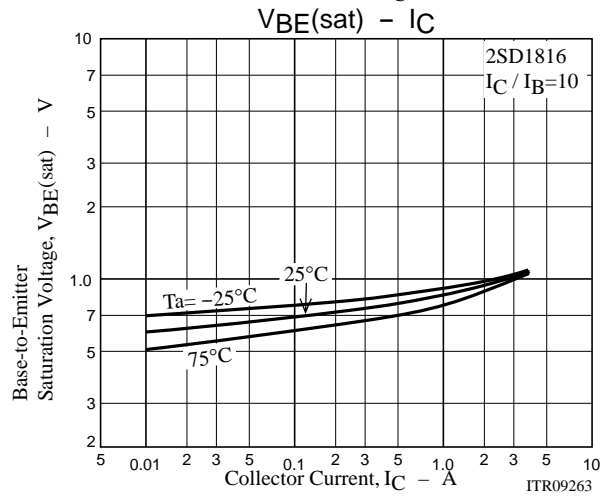
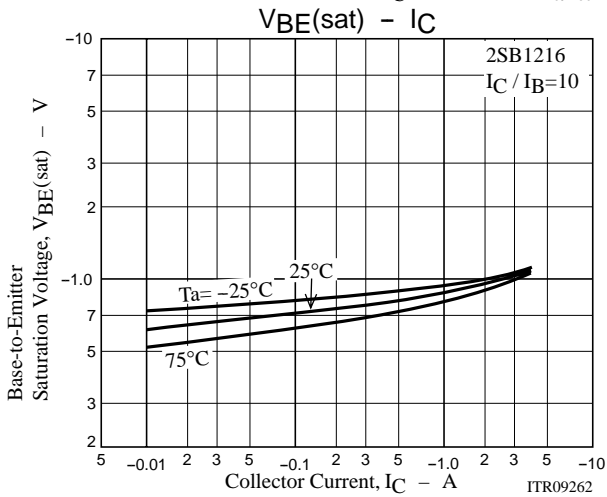
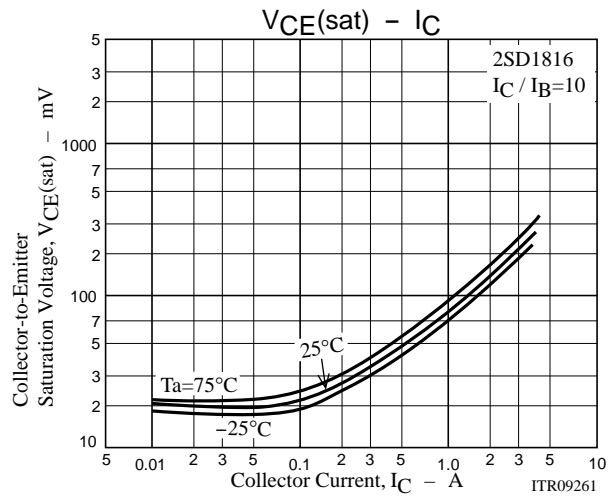
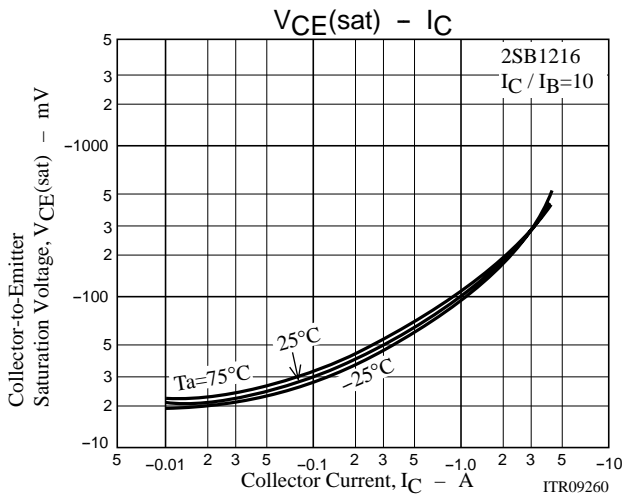
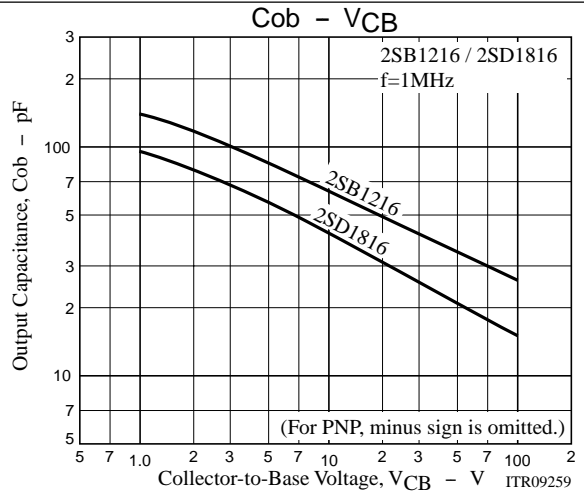
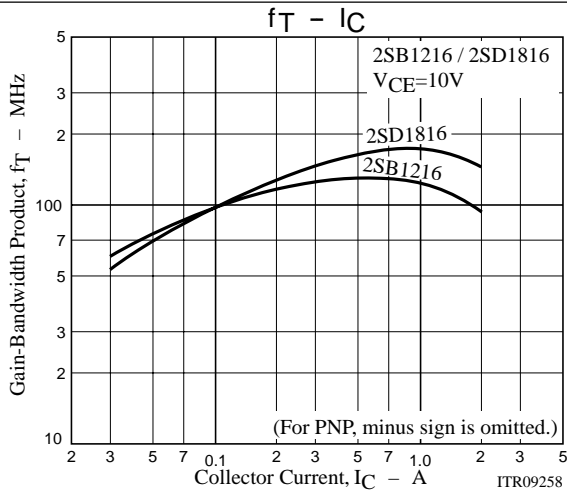


$I_C=10I_{B1} = -10I_{B2}=2\text{A}$
 (For PNP, minus sign is omitted.)

2SB1216/2SD1816



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