



2SB1165/2SD1722

50V/5A Switching Applications

Applications

- Relay drivers, high-speed inverters, converters.

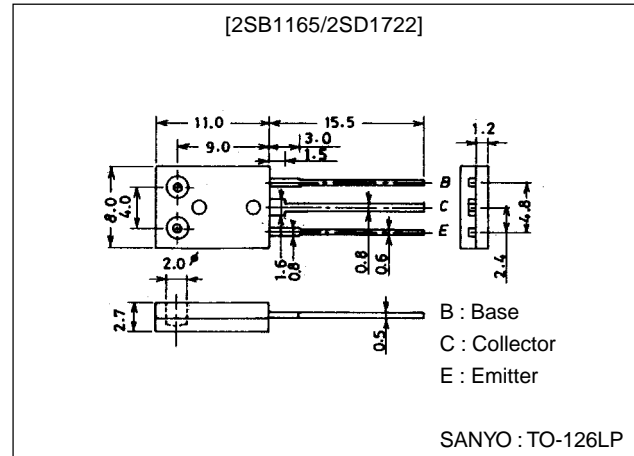
Features

- Low collector-to-emitter saturation voltage.
- High f_T .
- Excellent linearity of h_{FE} .
- Fast switching time.

Package Dimensions

unit:mm

2043A



() : 2SB1165

Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------------------|-------------|------------------|
| Collector-to-Base Voltage | V_{CB0} | | (-)60 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | (-)50 | V |
| Emitter-to-Base Voltage | V_{EBO} | | (-)6 | V |
| Collector Current | I_C | | (-)5 | A |
| Collector Current (Pulse) | I_{CP} | | (-)8 | A |
| Collector Dissipation | P_C | | 1.2 | 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} | $V_{CB}=-40\text{V}, I_E=0$ | | | (-)1 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=-4\text{V}, I_C=0$ | | | (-)1 | μA |
| DC Current Gain | h_{FE1} | $V_{CE}=-2\text{V}, I_C=-0.5\text{A}$ | 70* | | 400* | |
| | h_{FE2} | $V_{CE}=-2\text{V}, I_C=-4\text{A}$ | 35 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ | | 180 | | MHz |
| | | | | (130) | | MHz |
| Output Capacitance | C_{ob} | $V_{CB}=-10\text{V}, f=1\text{MHz}$ | | 40(60) | | pF |

* : The 2SB1165/2SD1722 are classified by 0.5A h_{FE} as follows :

| | | | | | | | | | | | |
|----|---|-----|-----|---|-----|-----|---|-----|-----|---|-----|
| 70 | Q | 140 | 100 | R | 200 | 140 | S | 280 | 200 | T | 400 |
|----|---|-----|-----|---|-----|-----|---|-----|-----|---|-----|

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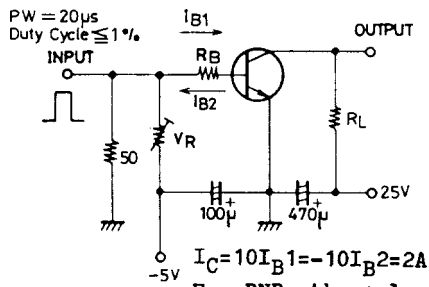
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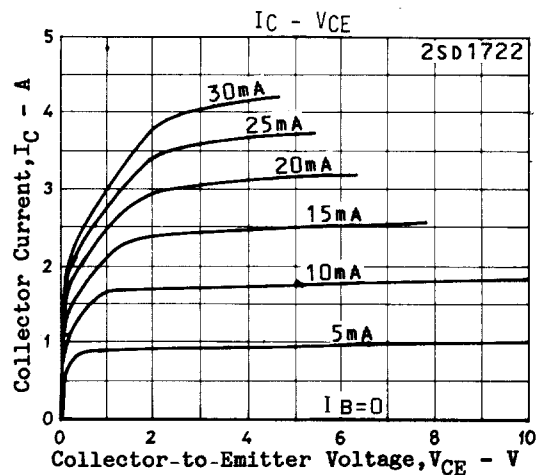
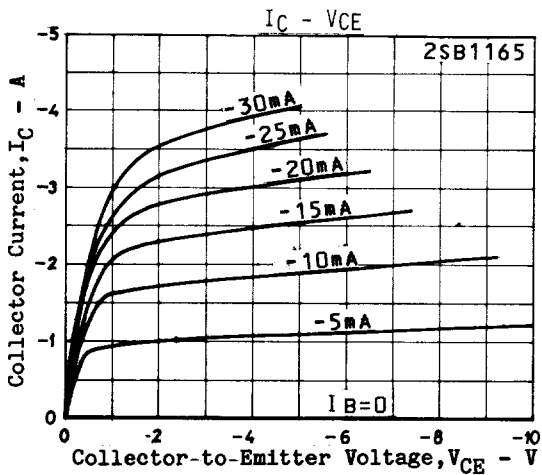
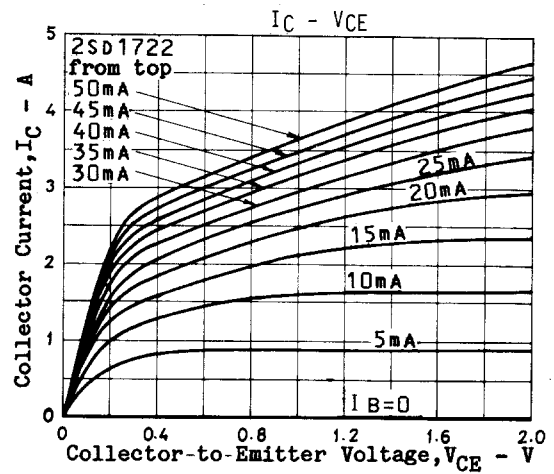
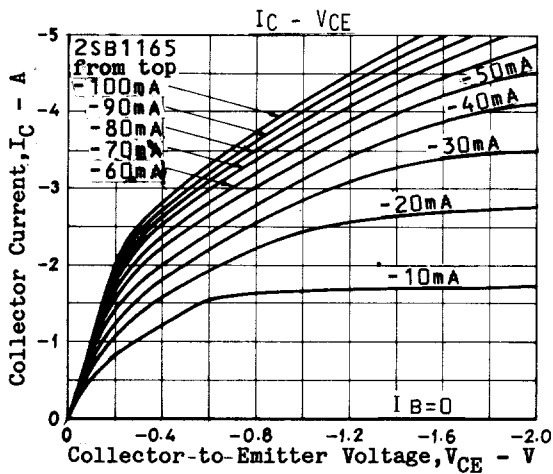
2SB1165/2SD1722

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|-----------------------------|---------|---------|--------|------|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)3A, I_B=(-)0.15A$ | | 220 | 400 | mV |
| | | | | (-280) | (-550) | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=(-)3A, I_B=(-)0.15A$ | | (-)0.95 | (-)1.3 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=(-)10\mu A, I_E=0$ | (-)60 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$ | (-)50 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=(-)10\mu A, I_C=0$ | (-)6 | | | V |
| Turn-ON Time | t_{on} | See specified Test Circuit | | (50)50 | | ns |
| Storage Time | t_{stg} | See specified Test Circuit | | 500 | | ns |
| | | | | (450) | | ns |
| Fall Time | t_f | See specified Test Circuit | | 20(20) | | ns |

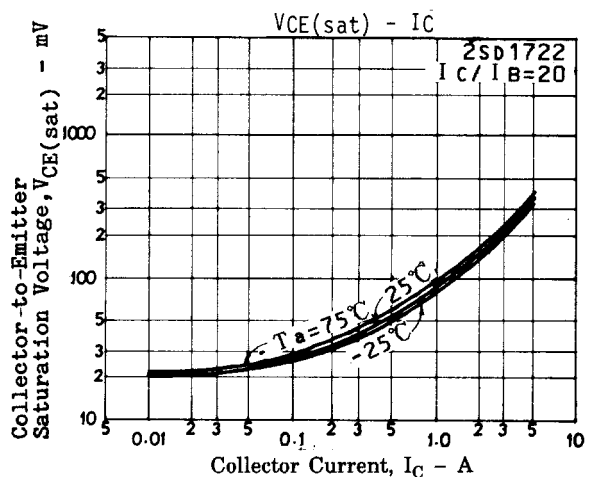
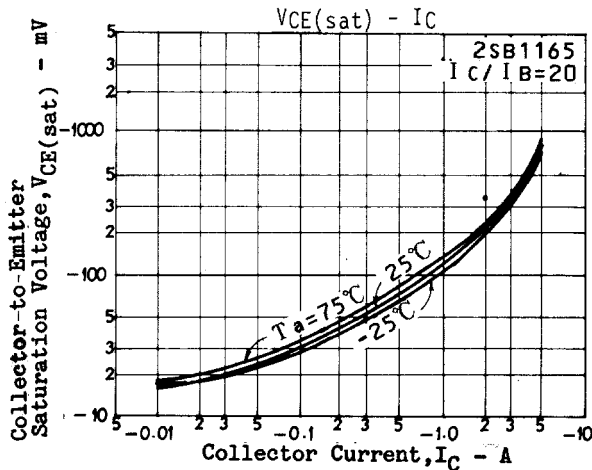
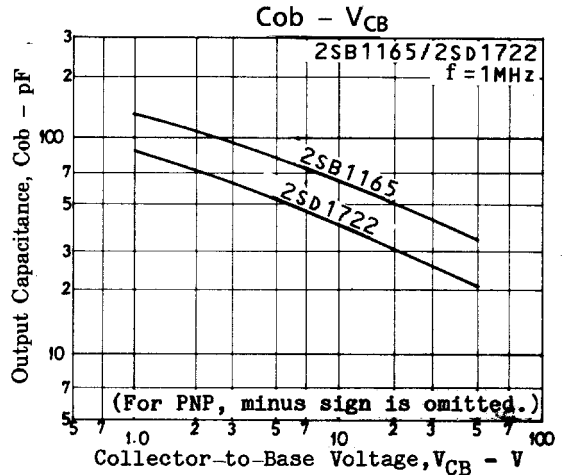
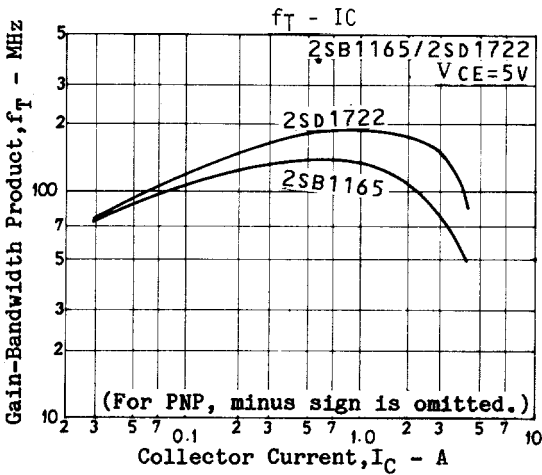
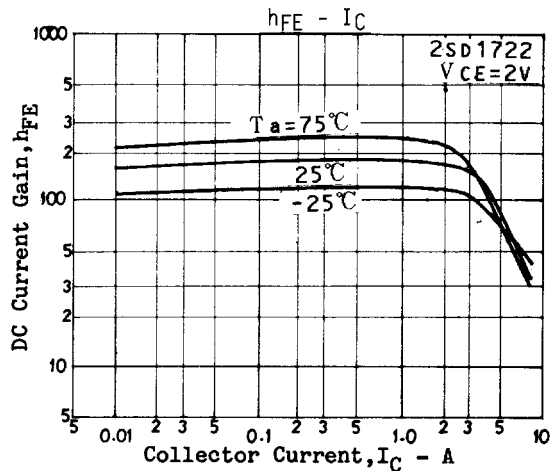
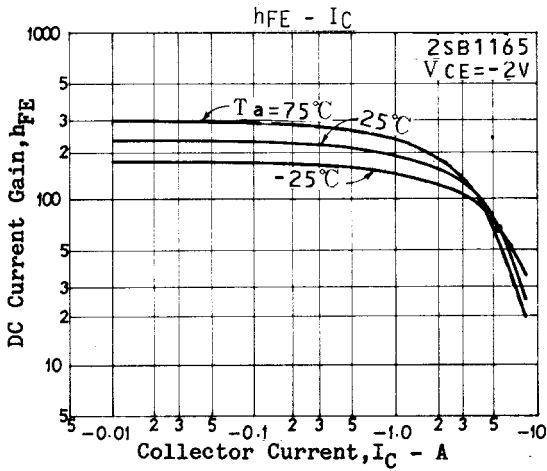
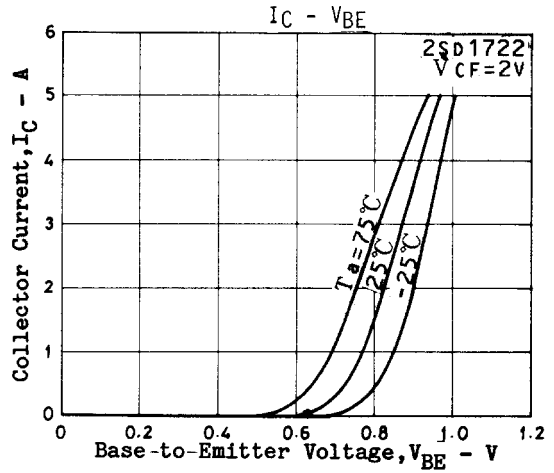
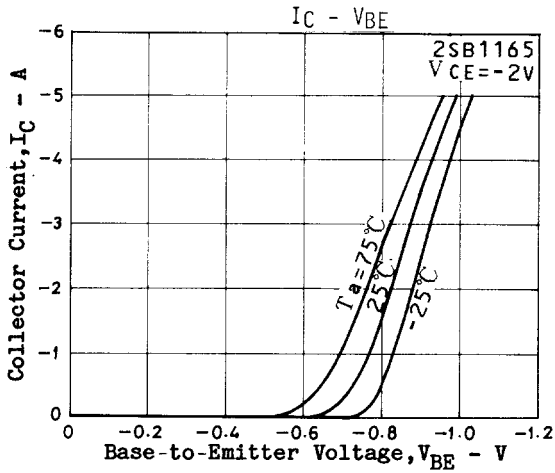
Switching Time Test Circuit



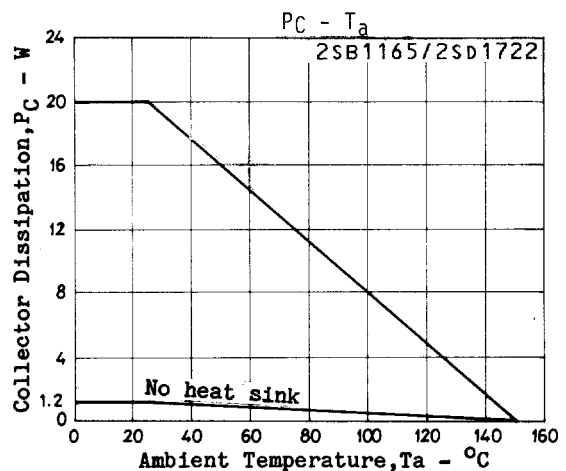
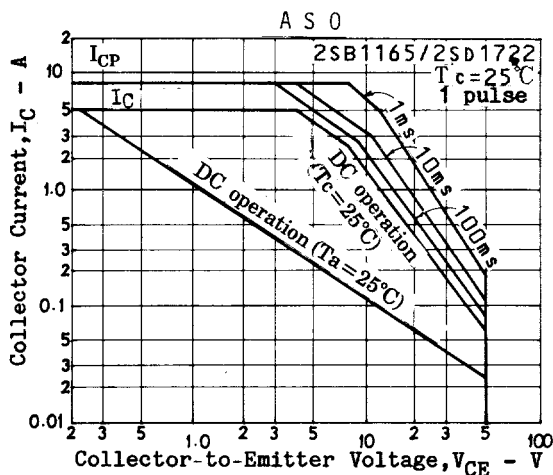
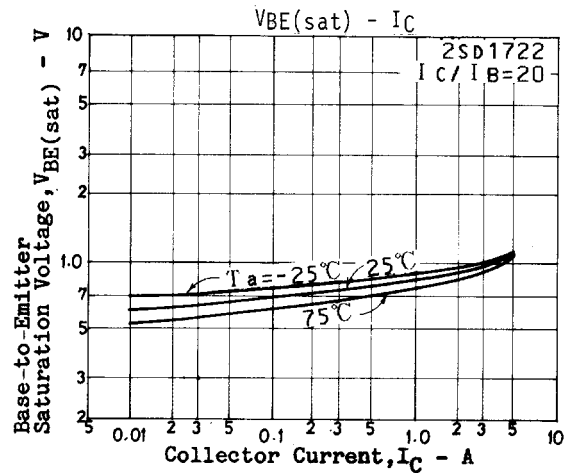
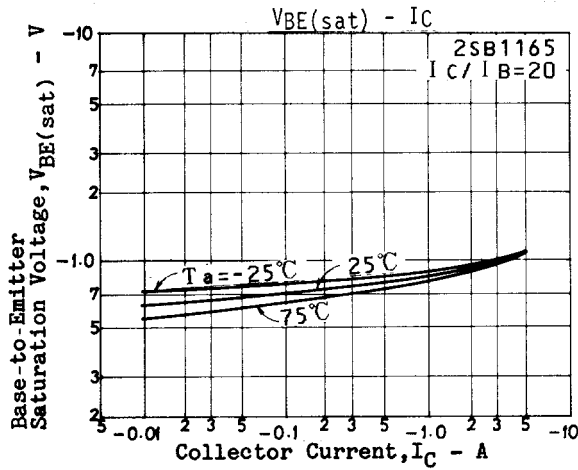
For PNP, the polarity is reversed.
Unit (resistance : Ω , capacitance : F)



2SB1165/2SD1722



2SB1165/2SD1722



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