

|              |          |  |
|--------------|----------|--|
| <b>SANYO</b> | No.2539B | <b>2SB1215/2SD1815</b>                       |
|              |          | PNP/NPN Epitaxial Planar Silicon Transistors |

**High-Current Switching Applications**

**Applications**

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

**Features**

- Low collector-to-emitter saturation voltage.
- Excellent linearity of  $h_{FE}$ .
- Small-sized package permitting 2SB1215/2SD1815-applied sets to be made small and slim.
- High  $f_T$ .
- Fast switching time.

( ) : 2SB1215

|  |           |             |                  |
|--|-----------|-------------|------------------|
| <b>Absolute Maximum Ratings at <math>T_a = 25^\circ\text{C}</math></b> |           |             | 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  | $I_C$     | (-)3        | A                |
| Collector Current (Pulse)  | $I_{CP}$  | (-)6        | A                |
| Collector Dissipation  | $P_C$     | 1           | W                |
|  |           | 20          | W                |
| Junction Temperature   | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

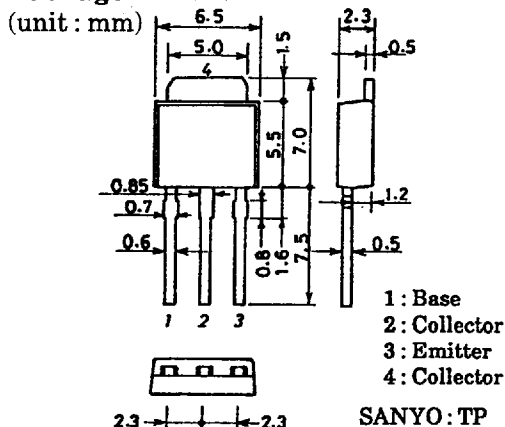
|  |               |  |     |              |      |               |
|--|---------------|--|-----|--------------|------|---------------|
| <b>Electrical Characteristics at <math>T_a = 25^\circ\text{C}</math></b> |               |  | min | typ          | max  | unit          |
| Collector Cutoff Current   | $I_{CBO}$     | $V_{CB} = (-)100\text{V}, I_E = 0$             |     |              | (-)1 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$     | $V_{EB} = (-)4\text{V}, I_C = 0$               |     |              | (-)1 | $\mu\text{A}$ |
| DC Current Gain  | $h_{FE(1)}$   | $V_{CE} = (-)5\text{V}, I_C = (-)0.5\text{A}$  | 70* |              | 400* |               |
|  | $h_{FE(2)}$   | $V_{CE} = (-)5\text{V}, I_C = (-)2\text{A}$    | 40  |              |      |               |
| Gain-Bandwidth Product   | $f_T$         | $V_{CE} = (-)10\text{V}, I_C = (-)0.5\text{A}$ |     | 180          |      | MHz           |
|  |               |  |     | (130)        |      |               |
| Output Capacitance   | $C_{ob}$      | $V_{CB} = (-)10\text{V}, f = 1\text{MHz}$      |     | (40)25       |      | pF            |
| C-E Saturation Voltage   | $V_{CE(sat)}$ | $I_C = (-)1.5\text{A}, I_B = (-)0.15\text{A}$  |     | 150          | 400  | mV            |
|  |               |  |     | (-200)(-500) |      |               |

Continued on next page.

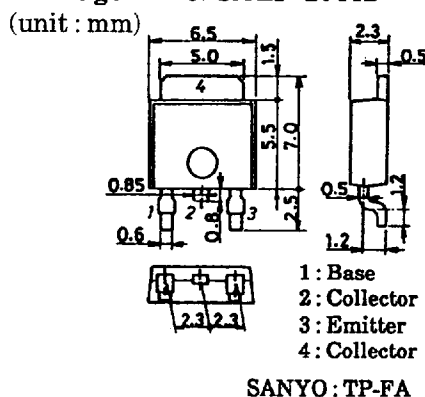
\* : The 2SB1215/2SD1815 are classified by 100mA  $h_{FE}$  as follows :

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

**Package Dimensions 2045B**



**Package Dimensions 2044B**



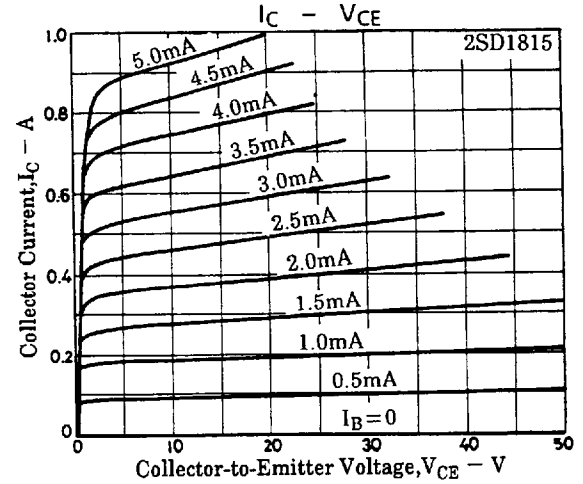
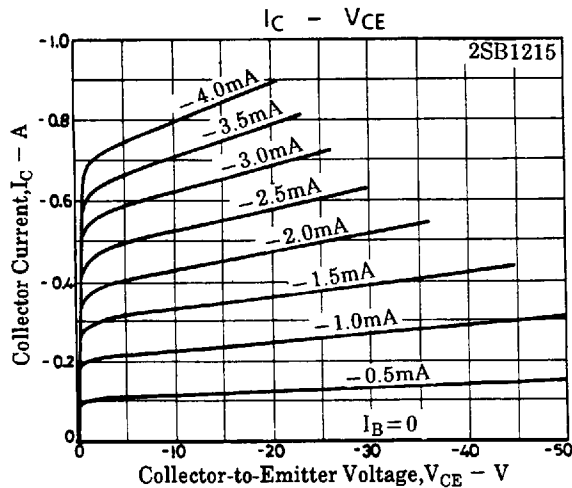
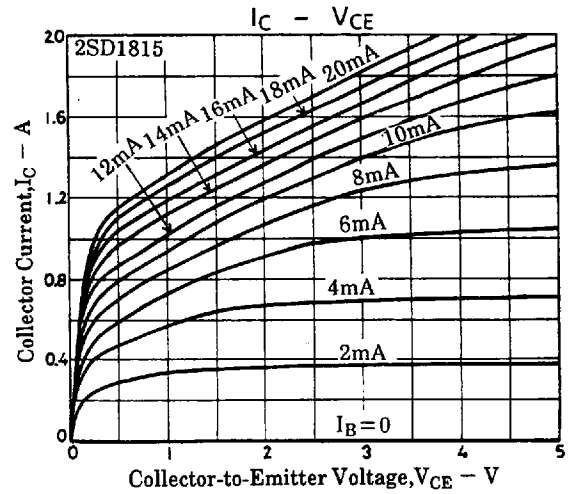
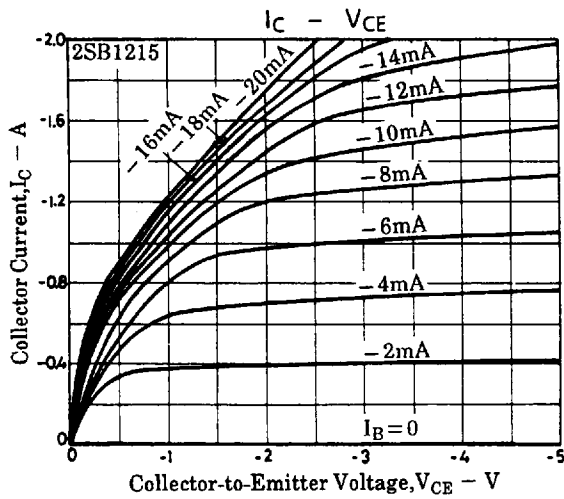
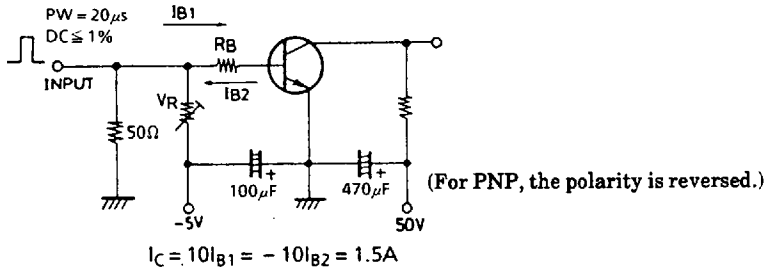
**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**  
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

## 2SB1215/2SD1815

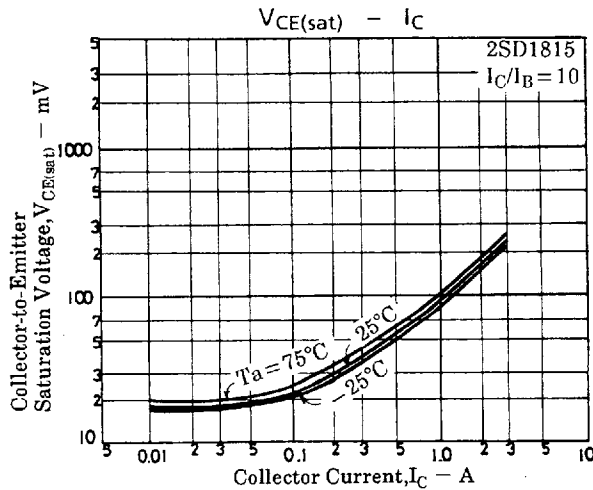
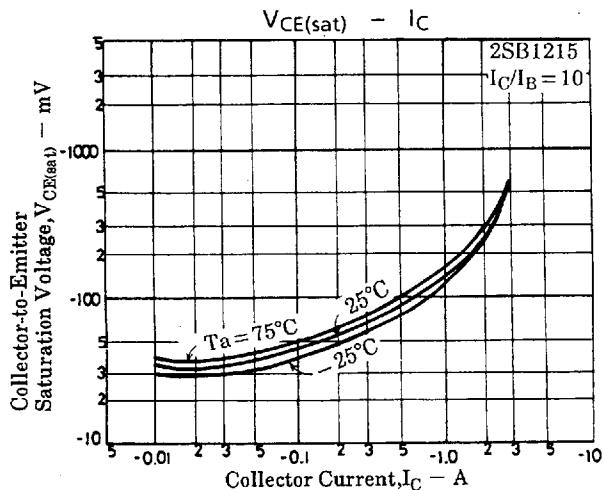
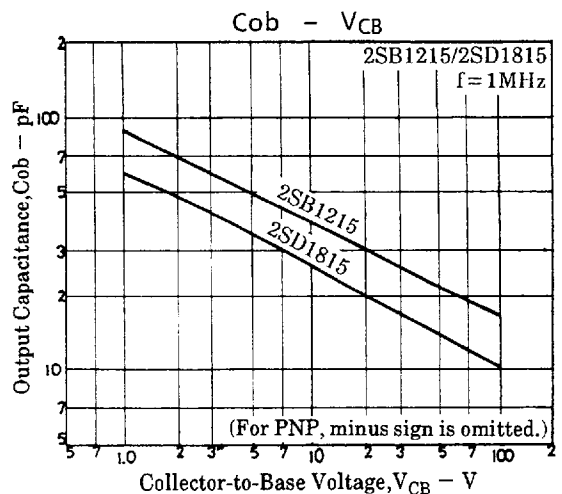
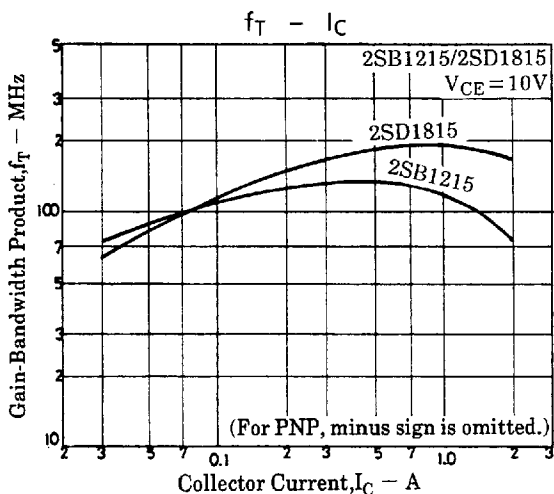
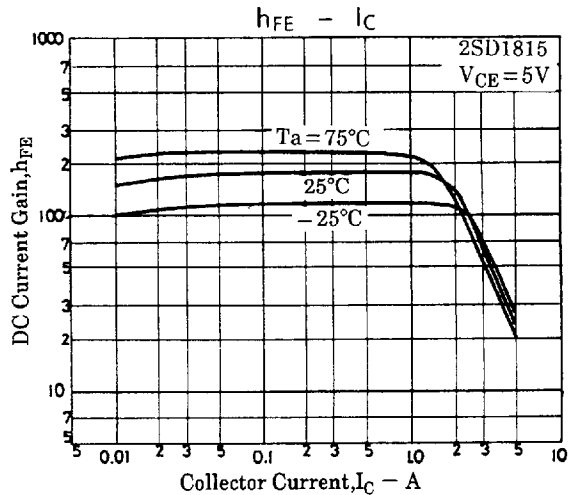
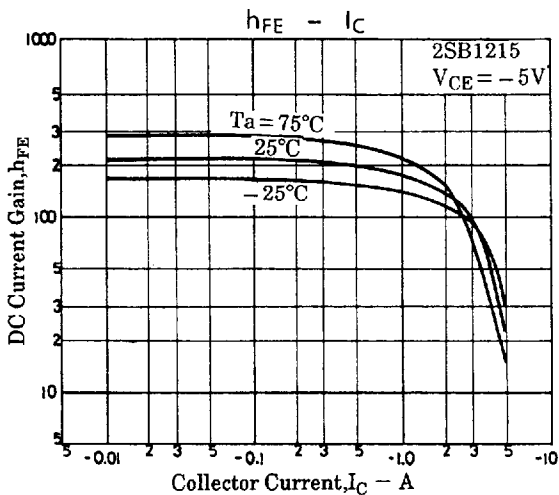
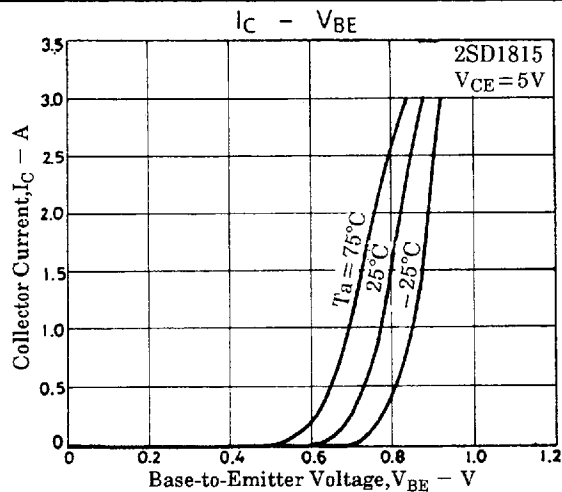
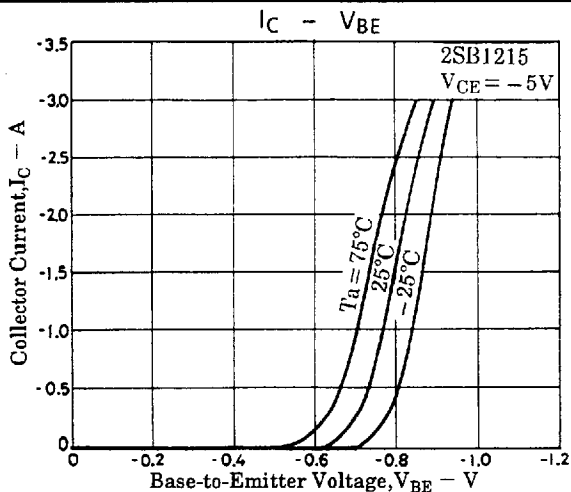
Continued from preceding page.

|                        |   | min      | typ            | max | unit |
|------------------------|---|----------|----------------|-----|------|
| B-E Saturation Voltage | $V_{BE(sat)}$ $I_C = (-)1.5A, I_B = (-)0.15A$ |          | $(-)0.9(-)1.2$ |     | V    |
| C-B Breakdown Voltage  | $V_{(BR)CBO}$ $I_C = (-)10\mu A, I_E = 0$     | $(-)120$ |                |     | V    |
| C-E Breakdown Voltage  | $V_{(BR)CEO}$ $I_C = (-)1mA, R_{BE} = \infty$ | $(-)100$ |                |     | V    |
| E-B Breakdown Voltage  | $V_{(BR)EBO}$ $I_E = (-)10\mu A, I_C = 0$     | $(-)6$   |                |     | V    |
| Rise Time              | $t_{on}$ See specified Test Circuit.          |          | 100            |     | ns   |
| Storage Time           | $t_{stg}$ "                                   |          | (800)900       |     | ns   |
| Fall Time              | $t_f$ "                                       |          | 50             |     | ns   |

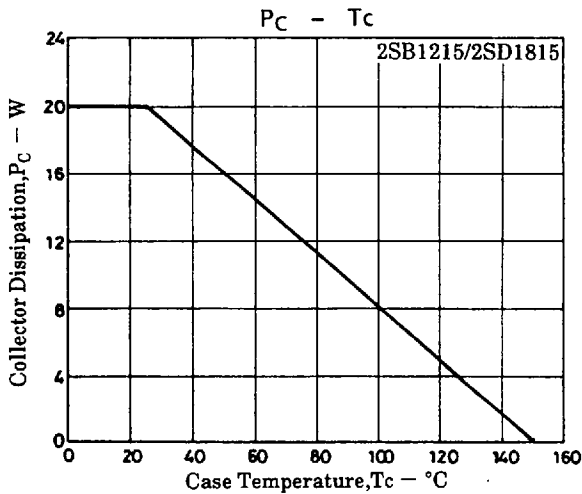
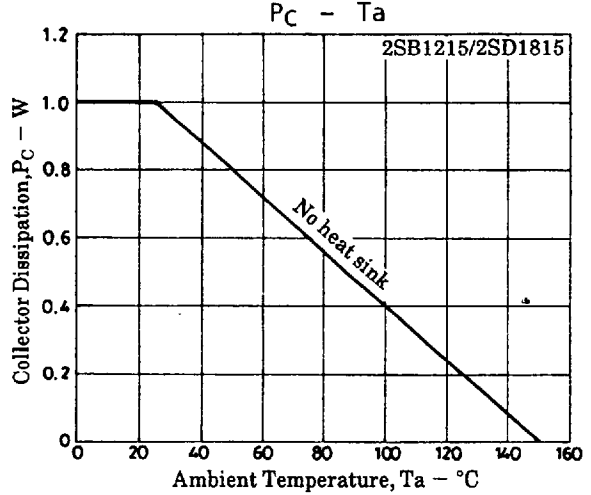
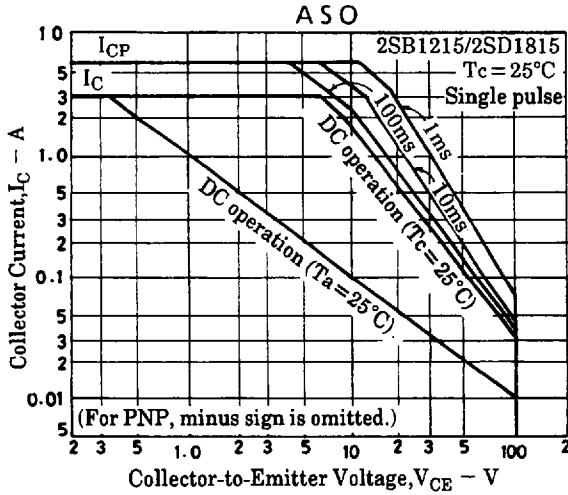
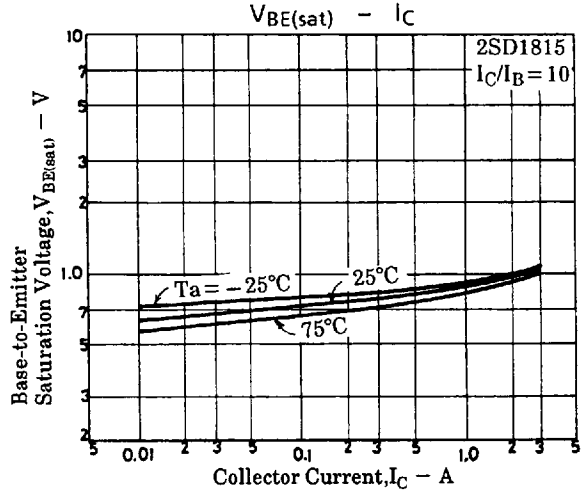
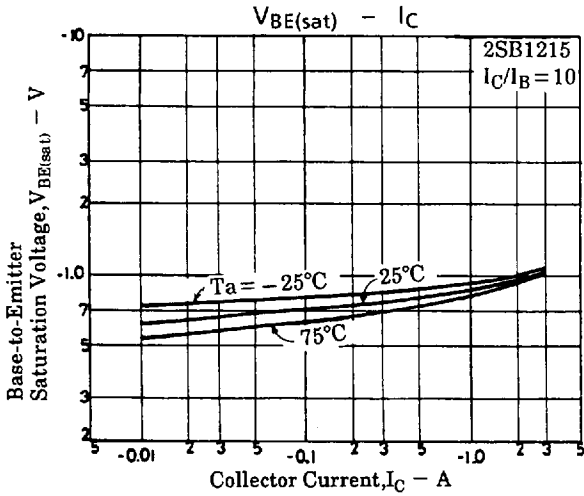
### Switching Time Test Circuit



2SB1215/2SD1815



2SB1215/2SD1815



- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
  - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use;
  - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of April, 1996. Specifications and information herein are subject to change without notice.