

|              |          |  |
|--------------|----------|--|
| <b>SANYO</b> | No.2063A | <b>2SB1143/2SD1683</b>   |
|              |          | PNP/NPN Epitaxial Planar Silicon Transistors<br><b>50V/4A Switching Applications</b> |

**Applications**

- . Voltage regulators, relay drivers, lamp drivers, electrical equipment

**Features**

- . Adoption of FBET, MBIT processes
- . Low saturation voltage
- . Large current capacity and wide ASO

( ): 2SB1143

|  |                  |             |      |
|--|------------------|-------------|------|
| <b>Absolute Maximum Ratings at Ta=25°C</b> |                  |             | unit |
| Collector-to-Base Voltage                  | V <sub>CB0</sub> | (-)60       | V    |
| Collector-to-Emitter Voltage               | V <sub>CEO</sub> | (-)50       | V    |
| Emitter-to-Base Voltage                    | V <sub>EBO</sub> | (-)6        | V    |
| Collector Current                          | I <sub>C</sub>   | (-)4        | A    |
| Collector Current (Pulse)                  | I <sub>CP</sub>  | (-)6        | A    |
| Collector Dissipation                      | P <sub>C</sub>   | 1.5         | W    |
|  |                  | 10          | W    |
| Junction Temperature                       | T <sub>j</sub>   | 150         | °C   |
| Storage Temperature                        | T <sub>stg</sub> | -55 to +150 | °C   |

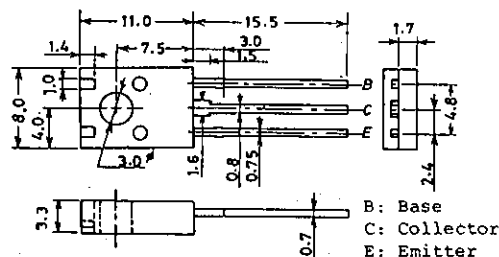
|  |                      |  |      |         |        |      |
|--|----------------------|--|------|---------|--------|------|
| <b>Electrical Characteristics at Ta=25°C</b> |                      |  | min  | typ     | max    | unit |
| Collector Cutoff Current                     | I <sub>CB0</sub>     | V <sub>CB</sub> =(-)40V, I <sub>E</sub> =0       |      |         | (-)1   | µA   |
| Emitter Cutoff Current                       | I <sub>EBO</sub>     | V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0        |      |         | (-)1   | µA   |
| DC Current Gain                              | h <sub>FE</sub> (1)  | V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)100mA | 100* |         | 56C*   |      |
|  | h <sub>FE</sub> (2)  | V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)3A    | 40   |         |        |      |
| Gain-Bandwidth Product                       | f <sub>T</sub>       | V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)50mA |      | 150     |        | MHz  |
| Output Capacitance                           | C <sub>ob</sub>      | V <sub>CB</sub> =(-)10V, f=1MHz                  |      | (39)    |        | pF   |
|  |                      |  |      | 25      |        | pF   |
| C-E Saturation Voltage                       | V <sub>CE(sat)</sub> | I <sub>C</sub> =(-)2A, I <sub>B</sub> =(-)100mA  |      | (-350)  | (-700) | mV   |
|  |                      |  |      | 190     | 500    | mV   |
| B-E Saturation Voltage                       | V <sub>BE(sat)</sub> | I <sub>C</sub> =(-)2A, I <sub>B</sub> =(-)100mA  |      | (-)0.94 | (-)1.2 | V    |

Continued on next page.

\*: The 2SB1143/2SD1683 are classified by 100mA h<sub>FE</sub> as follows:

|     |   |     |     |   |     |     |   |     |     |   |     |
|-----|---|-----|-----|---|-----|-----|---|-----|-----|---|-----|
| 100 | R | 200 | 140 | S | 280 | 200 | T | 400 | 280 | U | 560 |
|-----|---|-----|-----|---|-----|-----|---|-----|-----|---|-----|

**Package Dimensions 2042A**  
(unit:mm)

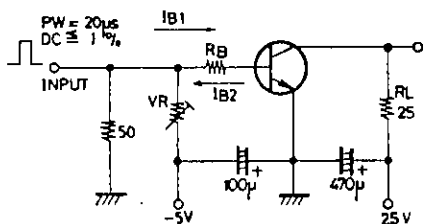


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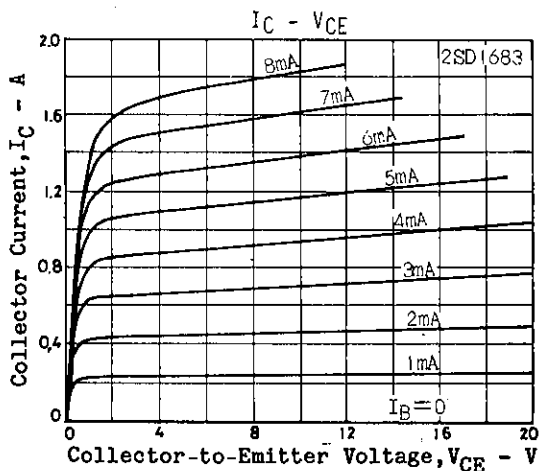
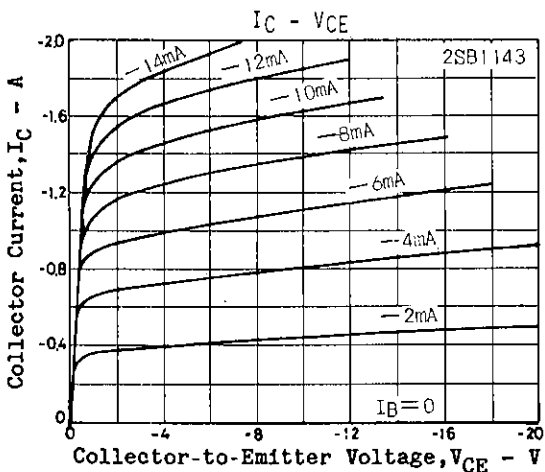
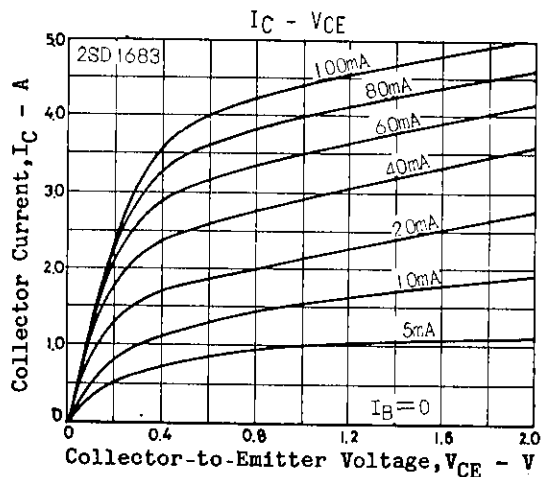
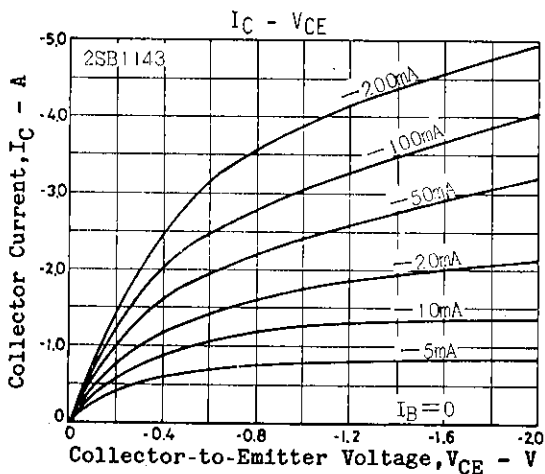
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|                       |               |                                  | min   | typ   | max | unit |
|-----------------------|---------------|----------------------------------|-------|-------|-----|------|
| C-B Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = (-) 10\mu A, I_E = 0$     | (-)60 |       |     | V    |
| C-E Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = (-) 1mA, R_{BE} = \infty$ | (-)50 |       |     | V    |
| E-B Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = (-) 10\mu A, I_C = 0$     | (-)6  |       |     | V    |
| Turn-on Time          | $t_{on}$      | See specified Test Circuit.      |       | (70)  |     | ns   |
|                       |               |                                  |       | 70    |     | ns   |
| Storage Time          | $t_{stg}$     |                                  |       | (450) |     | ns   |
|                       |               |                                  |       | 650   |     | ns   |
| Fall Time             | $t_f$         |                                  |       | (30)  |     | ns   |
|                       |               |                                  |       | 35    |     | ns   |

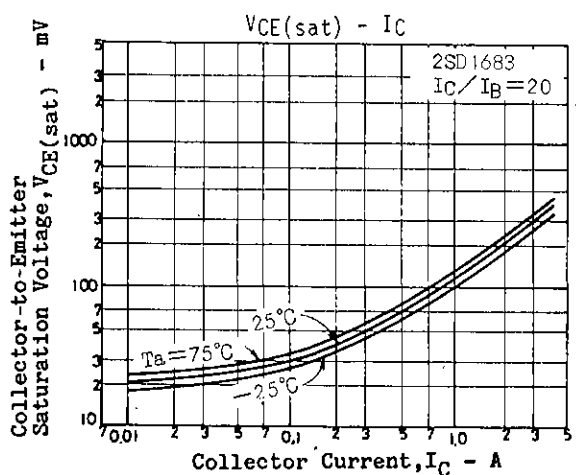
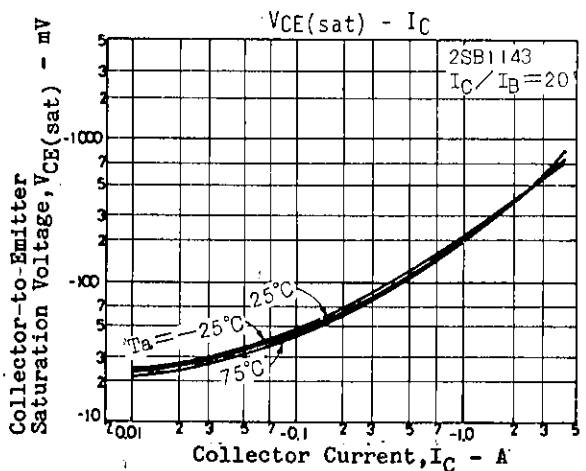
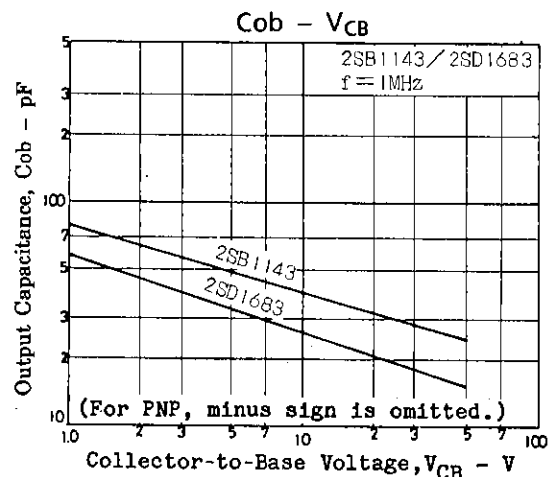
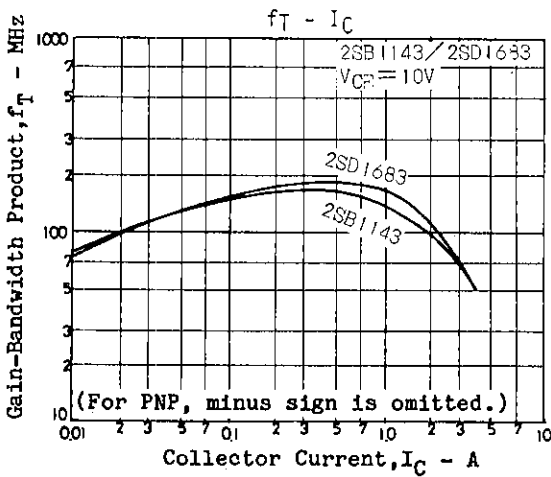
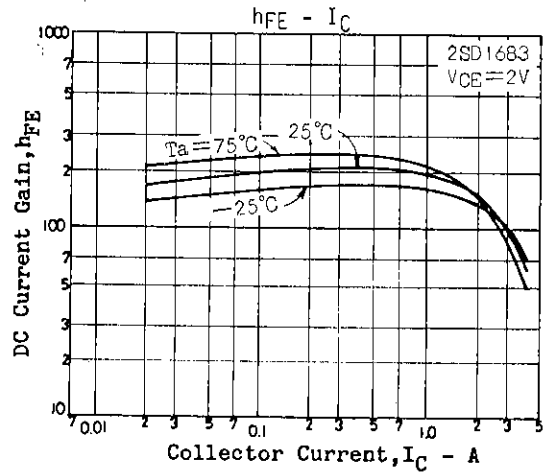
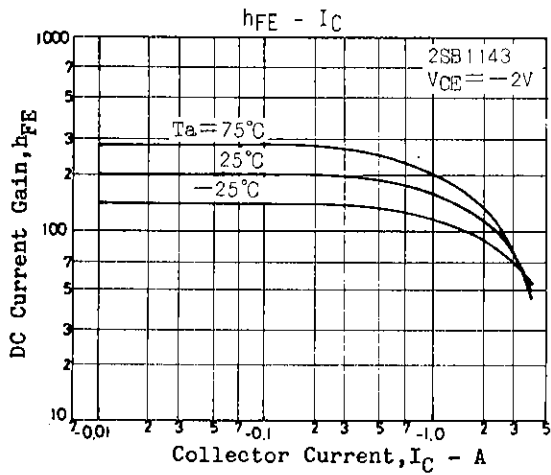
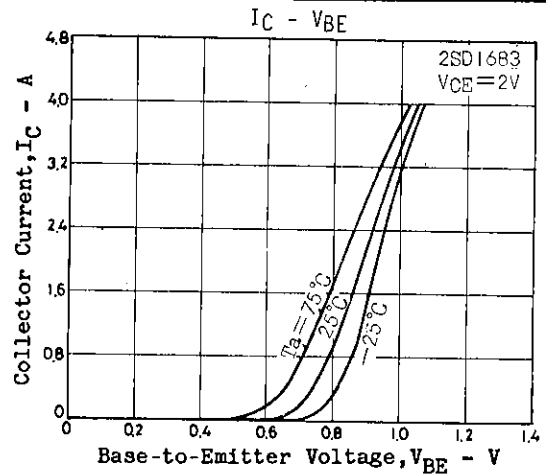
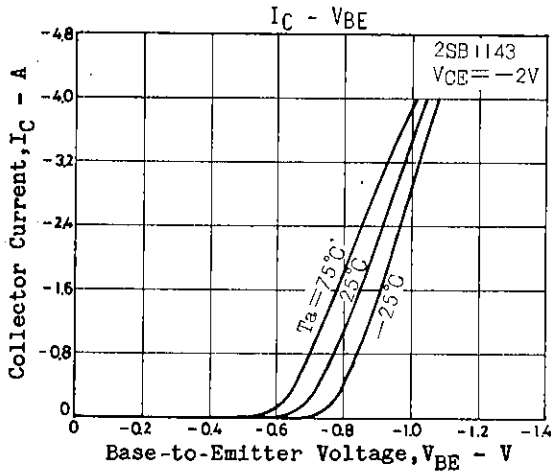
Switching Time Test Circuit

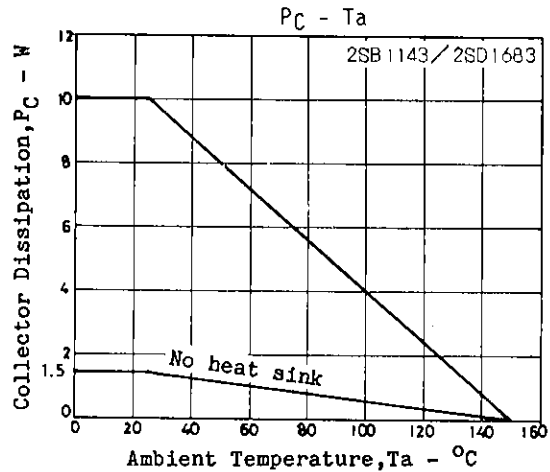
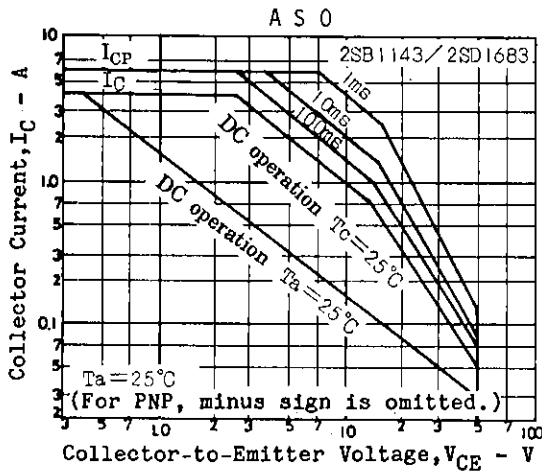
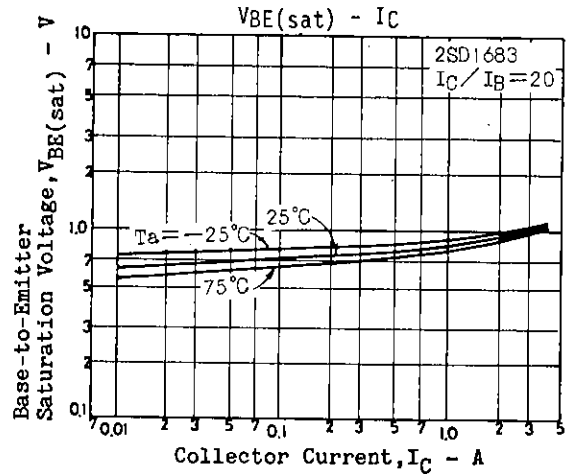
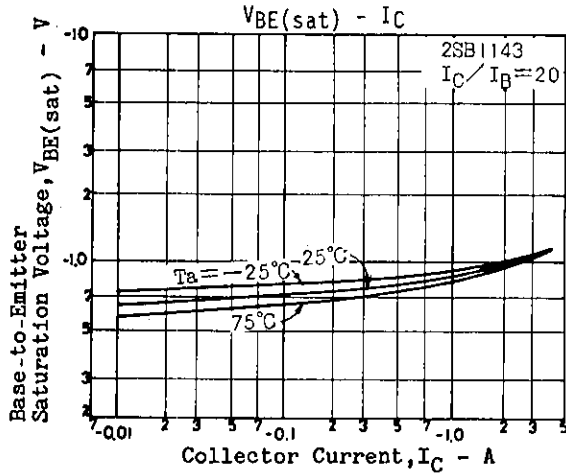


$I_C = 10I_{B1} = -10I_{B2} = 1A$   
(For PNP, the polarity is reversed.) Unit (Resistance :  $\Omega$ , Capacitance : F)



2SB1143/2SD1683





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