

**2SB1302****High-Current Switching Applications****Applications**

- DC-DC converters, motor drivers, relay drivers, lamp drivers.

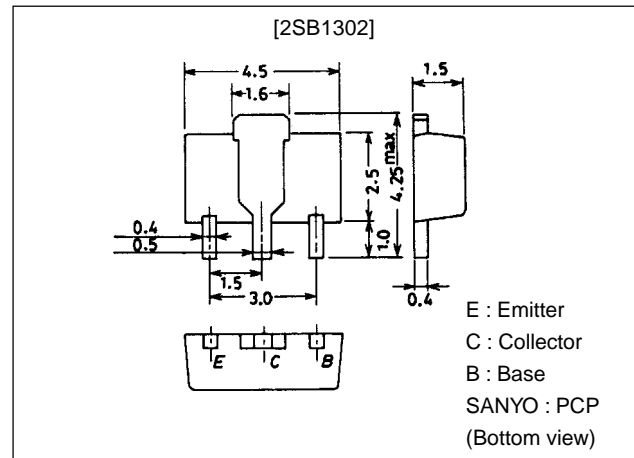
Features

- Adoption of FBET, MBIT processes.
- Low collector-to-emitter saturation voltage.
- Large current capacity.
- Fast switching speed.
- Very small size making it easy to provide high-density, small-sized hybrid ICs.

Package Dimensions

unit:mm

2038

**Specifications****Absolute Maximum Ratings at Ta = 25°C**

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|---|-------------|------|
| Collector-to-Base Voltage | V_{CB0} | | -25 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | -20 | V |
| Emitter-to-Base Voltage | V_{EBO} | | -5 | V |
| Collector Current | I_C | | -5 | A |
| Collector Current (Pulse) | I_{CP} | | -8 | A |
| Collector Dissipation | P_C | Mounted on ceramic board (250mm \times 0.8mm) | 1.3 | W |
| Junction Temperature | T_J | | 150 | °C |
| Storage Temperature | T_{stg} | | -55 to +150 | °C |

Electrical Characteristics at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------|-----------|--------------------------|---------|-----|------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB}=-20V, I_E=0$ | | | -500 | nA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=-4V, I_C=0$ | | | -500 | nA |
| DC Current Gain | h_{FE1} | $V_{CE}=-2V, I_C=-500mA$ | 100* | | 400* | |
| | h_{FE2} | $V_{CE}=-2V, I_C=-4A$ | 60 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE}=-5V, I_C=-200mA$ | | 320 | | MHz |
| Output Capacitance | C_{ob} | $V_{CB}=-10V, f=1MHz$ | | 60 | | pF |

* : The 2SB1302 is classified by 500mA h_{FE} as follows :

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

Marking : BJ

 h_{FE} rank : R, S, T

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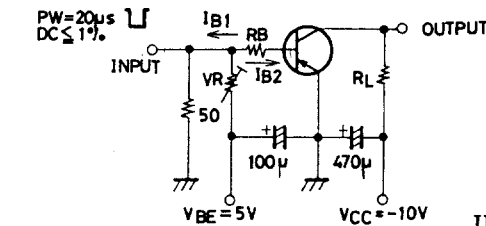
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O1598HA (KT)/D2680MO/4097TA, TS No.2555-1/4

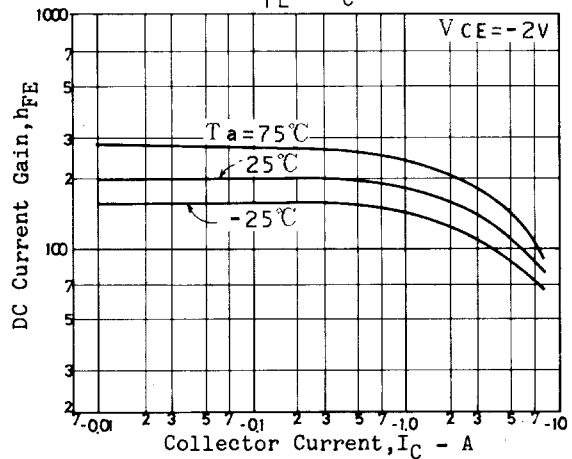
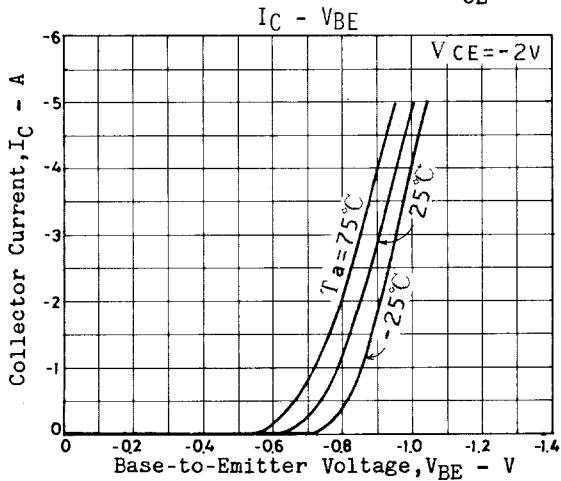
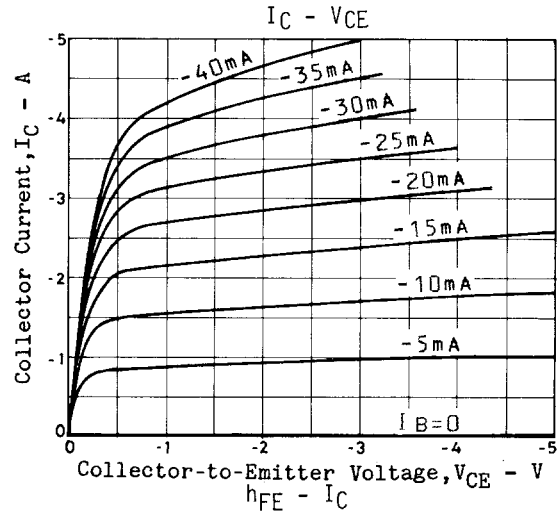
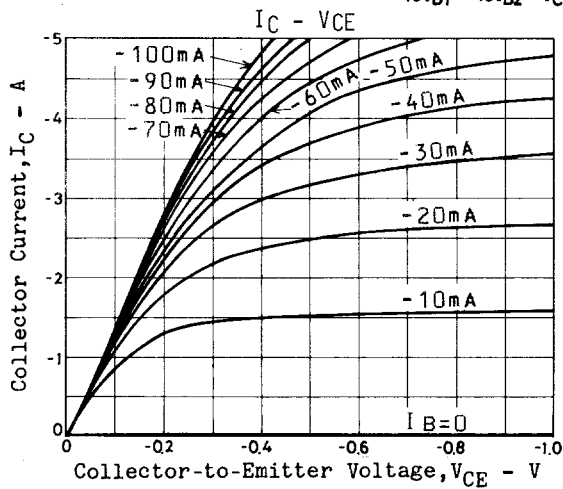
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| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|-------------------------------|---------|------|------|------|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = -3A, I_B = -60mA$ | | -250 | -500 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = -3A, I_B = -60mA$ | | -1.0 | -1.3 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = -10\mu A, I_E = 0$ | -25 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = -1mA, R_{BE} = \infty$ | -20 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = -10\mu A, I_C = 0$ | -5 | | | V |
| Turn-ON Time | t_{on} | See specified test circuit. | | 40 | | ns |
| Storage Time | t_{stg} | See specified test circuit. | | 200 | | ns |
| Fall Time | t_f | See specified test circuit. | | 10 | | ns |

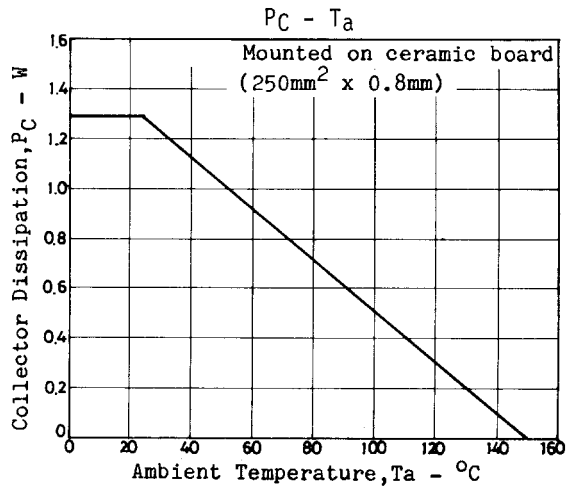
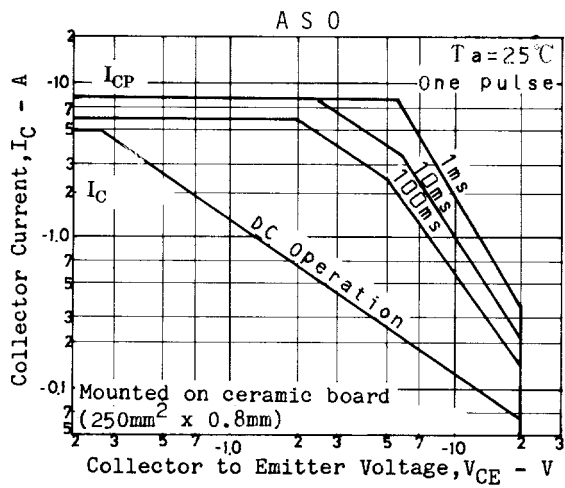
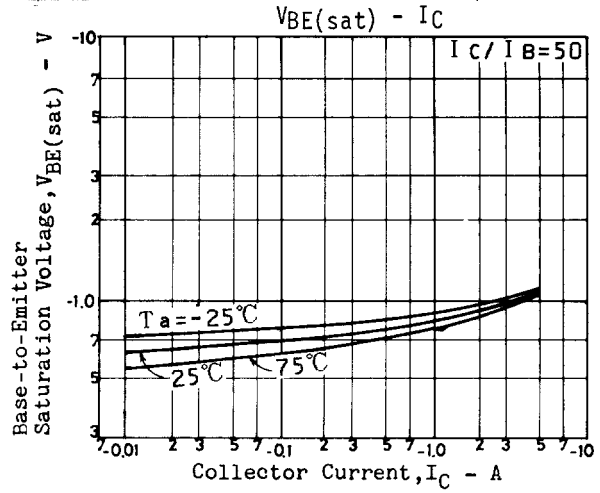
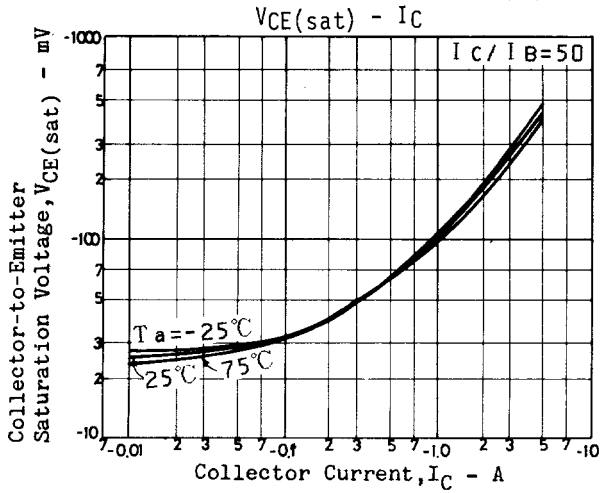
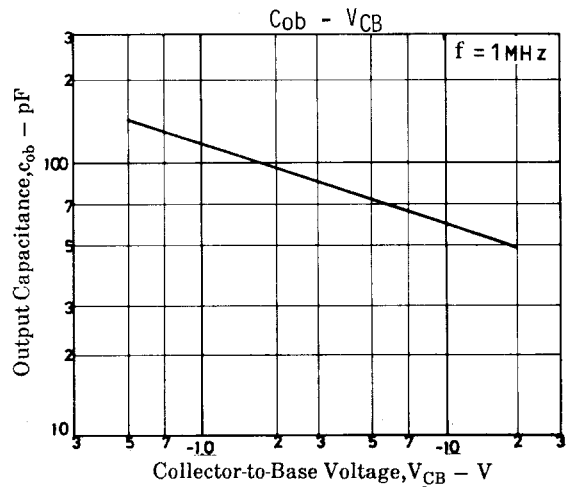
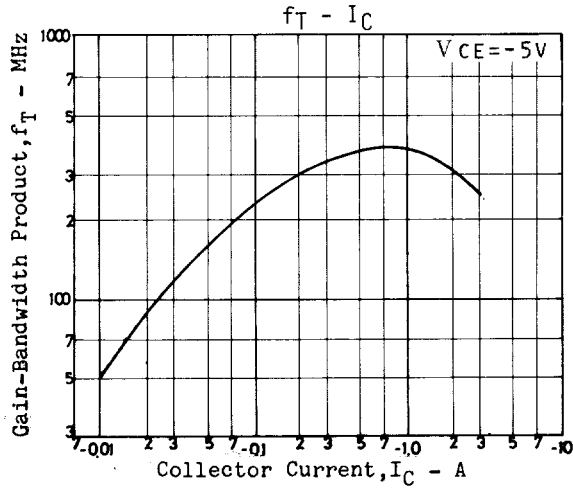
Switching Time Test Circuit



Unit (resistance : Ω , capacitance : F)



2SB1302



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