

# Medium power transistor(−80V, −0.7A)

2SB1189 / 2SB1238

## ●Features

- 1) High breakdown voltage,  $BV_{CEO} = -80V$ , and high current,  $I_C = -0.7A$ .
- 2) Complements the 2SD1767 / 2SD1859.

## ●Absolute maximum ratings ( $T_a = 25^\circ C$ )

| Parameter                   | Symbol    | Limits      | Unit       |
|-----------------------------|-----------|-------------|------------|
| Collector-base voltage      | $V_{CBO}$ | −80         | V          |
| Collector-emitter voltage   | $V_{CEO}$ | −80         | V          |
| Emitter-base voltage        | $V_{EB0}$ | −5          | V          |
| Collector current           | $I_C$     | −0.7        | A          |
| Collector power dissipation | 2SB1189   | $P_C$       | 0.5        |
|                             |           |             | 2          |
|                             |           |             | 1          |
| Junction temperature        | $T_J$     | 150         | $^\circ C$ |
| Storage temperature         | $T_{stg}$ | −55 to +150 | $^\circ C$ |

\*1 When mounted on a 40×40×0.7 mm ceramic board.

\*2 Printed circuit board 1.7 mm thick, collector plating 1cm<sup>2</sup> or larger.

## ●Packaging specifications and $h_{FE}$

| Type                         | 2SB1189 | 2SB1238 |
|------------------------------|---------|---------|
| Package                      | MPT3    | ATV     |
| $h_{FE}$                     | QR      | QR      |
| Marking                      | BD*     | —       |
| Code                         | T100    | TV2     |
| Basic ordering unit (pieces) | 1000    | 2500    |

\*Denotes  $h_{FE}$

## ●Dimensions (Unit : mm)

|              |               |
|--------------|---------------|
| 2SB1189      |               |
|              |               |
| ROHM : MPT3  | (1) Base      |
| EIAJ : SC-62 | (2) Collector |
|              | (3) Emitter   |
| 2SB1238      |               |
|              |               |
| ROHM : ATV   | (1) Emitter   |
|              | (2) Collector |
|              | (3) Base      |

Taping specifications

## ●Electrical characteristics ( $T_a = 25^\circ C$ )

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit    | Conditions                              |
|--------------------------------------|---------------|------|------|------|---------|-----------------------------------------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | −80  | —    | —    | V       | $I_C = -50\mu A$                        |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | −80  | —    | —    | V       | $I_C = -2mA$                            |
| Emitter-base breakdown voltage       | $BV_{EB0}$    | −5   | —    | —    | V       | $I_E = -50\mu A$                        |
| Collector cutoff current             | $I_{CBO}$     | —    | —    | −0.5 | $\mu A$ | $V_{CB} = -50V$                         |
| Emitter cutoff current               | $I_{EB0}$     | —    | —    | −0.5 | $\mu A$ | $V_{EB} = -4V$                          |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —    | −0.2 | −0.4 | V       | $I_C/I_E = -500mA/-50mA$                |
| DC current transfer ratio            | $h_{FE}$      | 120  | —    | 390  | —       | $V_{CE}/I_C = -3V/-0.1A$                |
| Transition frequency                 | $f_T$         | —    | 100  | —    | MHz     | $V_{CE} = -10V, I_E = 50mA, f = 100MHz$ |
| Output capacitance                   | $C_{ob}$      | —    | 14   | 20   | pF      | $V_{CB} = -10V, I_E = 0A, f = 1MHz$     |

## ●Electrical characteristics curves

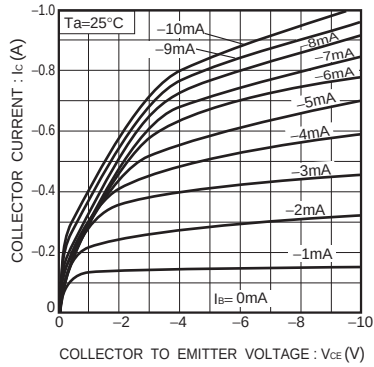


Fig.1 Ground emitter output characteristics

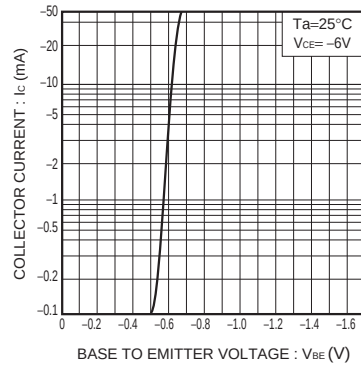


Fig.2 Ground emitter propagation characteristics

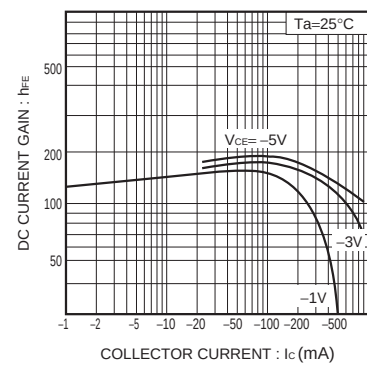


Fig.3 DC current gain vs. collector current

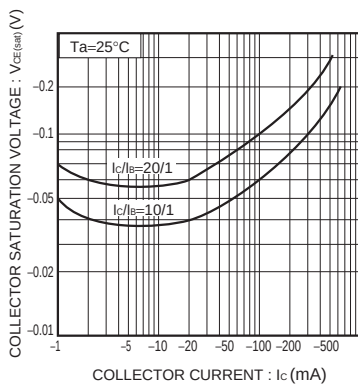


Fig.4 Collector-emitter saturation voltage vs. collector current

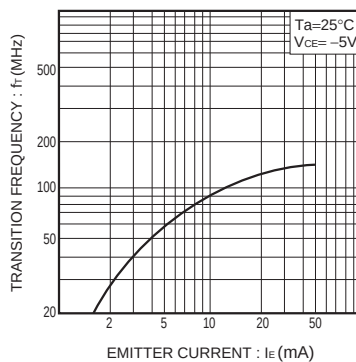


Fig.5 Gain bandwidth product vs. emitter current

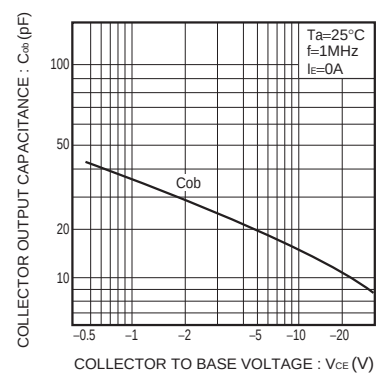


Fig.6 Collector output capacitance vs. collector-base voltage

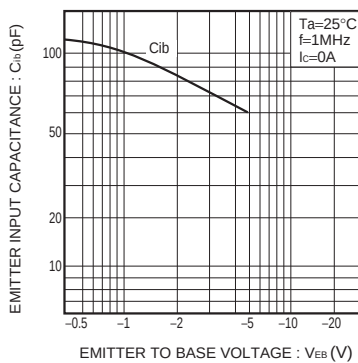


Fig.7 Emitter input capacitance vs. emitter-base voltage

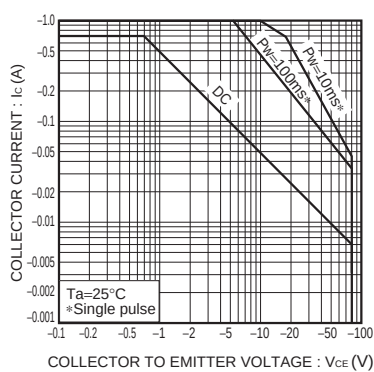


Fig.8 Safe operating area (2SB1189)

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