

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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2SC1881(K)

Silicon NPN Triple Diffused

RENESAS

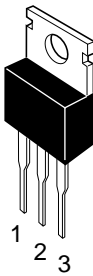
ADE-208-882 (Z)
1st. Edition
September 2000

Application

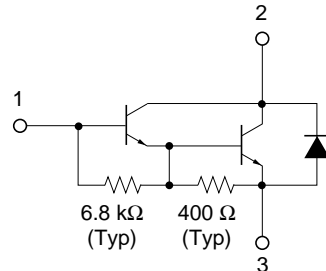
High gain amplifier power switching

Outline

TO-220AB



1. Base
2. Collector (Flange)
3. Emitter



Absolute Maximum Ratings (T_a = 25°C)

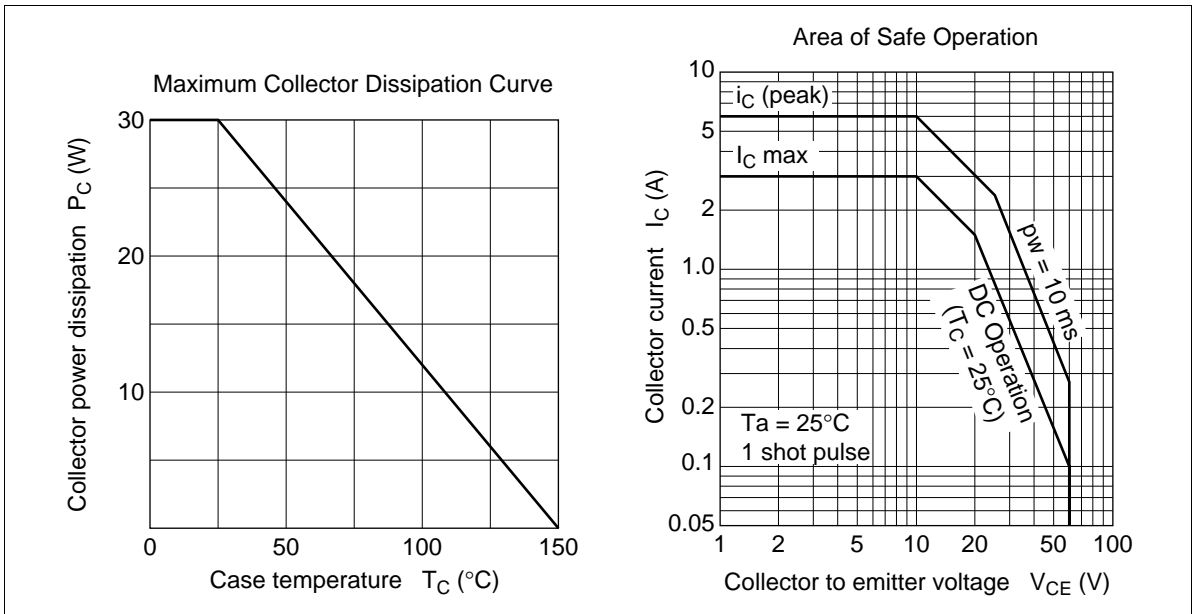
| Item | Symbol | Ratings | Unit |
|------------------------------|------------------------------|-------------|------|
| Collector to base voltage | V _{CBO} | 60 | V |
| Collector to emitter voltage | V _{CEO} | 60 | V |
| Emitter to base voltage | V _{EBO} | 7 | V |
| Collector current | I _C | 3 | A |
| Collector peak current | I _{C(peak)} | 6 | A |
| Collector power dissipation | P _C ^{*1} | 30 | W |
| Junction temperature | T _j | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

Note: 1. Value at T_c = 25°C.

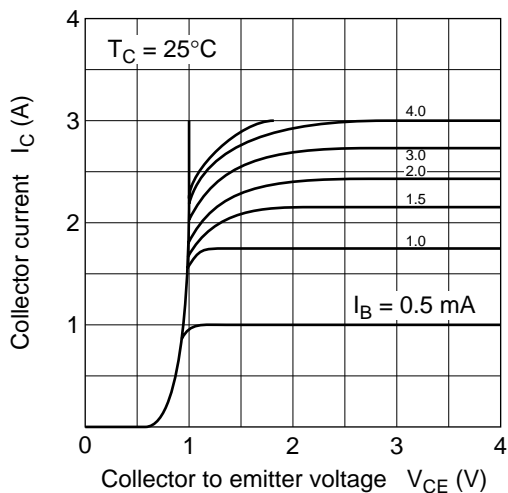
Electrical Characteristics (Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---------------|------|-----|-----|---------------|---|
| Collector to emitter breakdown voltage | $V_{(BR)CEO}$ | 60 | — | — | V | $I_C = 50 \text{ mA}$, $R_{BE} = \infty$ |
| Emitter to base breakdown voltage | $V_{(BR)EBO}$ | 7 | — | — | V | $I_E = 50 \text{ mA}$, $I_C = 0$ |
| Collector cutoff current | I_{CBO} | — | — | 0.2 | mA | $V_{CB} = 60 \text{ V}$, $I_E = 0$ |
| | I_{CEO} | — | — | 0.4 | mA | $V_{CE} = 30 \text{ V}$, $R_{BE} = \infty$ |
| DC current transfer ratio | h_{FE} | 1000 | — | — | | $V_{CE} = 1.5 \text{ V}$ $I_C = 1.5 \text{ A}^{*1}$ |
| | | 500 | — | — | | $I_C = 2.5 \text{ A}^{*1}$ |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | — | 1.2 | V | $I_C = 2.5 \text{ A}$, $I_B = 20 \text{ mA}^{*1}$ |
| Turn on time | t_{on} | — | 1 | — | μs | $V_{CC} = 11 \text{ V}$, $I_C = 2 \text{ A}$, |
| Turn off time | t_{off} | — | 5 | — | μs | $I_{B1} = -I_{B2} = 8 \text{ mA}$ |

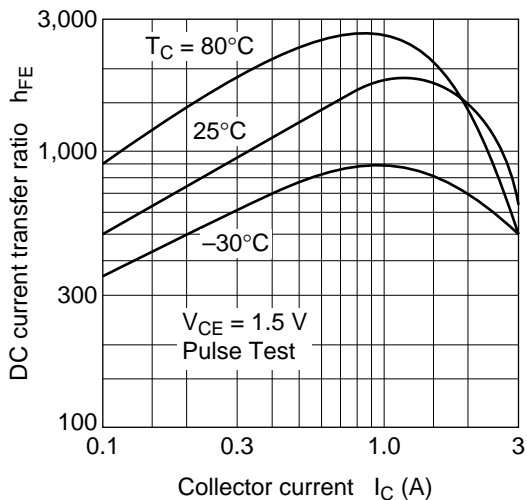
Note: 1. Pulse test.



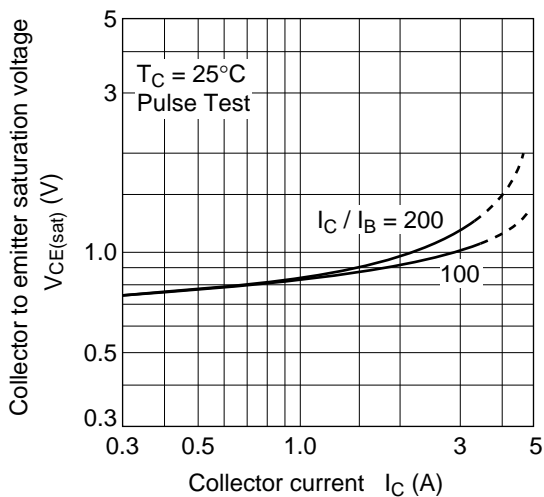
Typical Output Characteristics



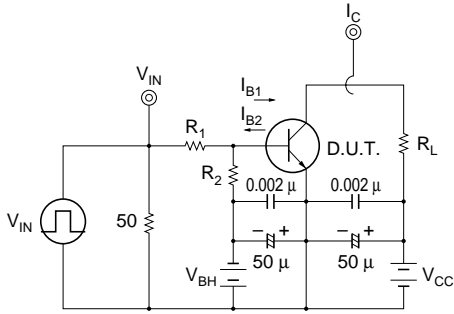
DC Current Transfer Ratio vs. Collector Current



Collector to Emitter Saturation Voltage vs. Collector Current



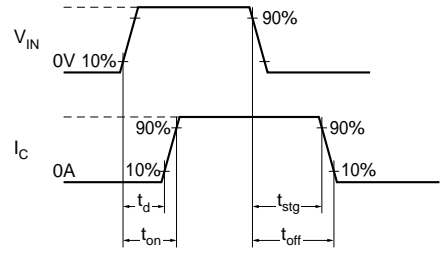
Switching Time Test Circuit



$t_r, t_f \leq 10 \text{ ns}$
 $\text{pw} \geq 100 \mu\text{s}$
 $\text{duty ratio} \leq 10\%$

Unit R : Ω
 C : F

Response Waveform



| I_C | I_{B1} | I_{B2} | V_{CC} | V_{BB} | V_{IN} | R_L | R_1 | R_2 |
|-------|----------|----------|----------|----------|----------|----------|----------|----------|
| A | mA | mA | V | V | V | Ω | Ω | Ω |
| 2 | 8 | -8 | 11 | -4 | 7.2 | 5 | 620 | 910 |

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