

To all our customers

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

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Keep safety first in your circuit designs!

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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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# 2SB1399

Silicon PNP Triple Diffused

RENESAS

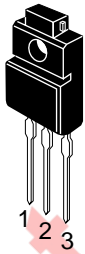
ADE-208-873 (Z)  
1st. Edition  
September 2000

## Application

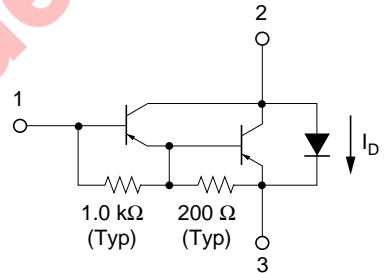
Low frequency power amplifier

## Outline

TO-220FM



- 1. Base
- 2. Collector
- 3. Emitter



## Absolute Maximum Ratings (Ta = 25°C)

| Item                         | Symbol        | Ratings     | Unit |
|------------------------------|---------------|-------------|------|
| Collector to base voltage    | $V_{CBO}$     | -120        | V    |
| Collector to emitter voltage | $V_{CEO}$     | -120        | V    |
| Emitter to base voltage      | $V_{EBO}$     | -7          | V    |
| Collector current            | $I_C$         | -10         | A    |
| Collector peak current       | $I_{C(peak)}$ | -15         | A    |
| Collector power dissipation  | $P_C$         | 2           | W    |
|                              | $P_C^{*1}$    | 30          |      |
| Junction temperature         | $T_j$         | 150         | °C   |
| Storage temperature          | $T_{stg}$     | -55 to +150 | °C   |
| C to E diode forward current | $I_D^{*1}$    | 10          | A    |

Note: 1. Value at  $T_C = 25^\circ\text{C}$ .

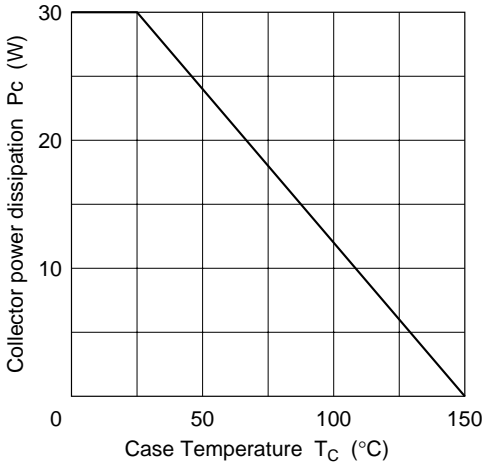
## Electrical Characteristics (Ta = 25°C)

| Item                                    | Symbol         | Min  | Typ | Max   | Unit          | Test Conditions                                    |
|---|----------------|------|-----|-------|---------------|--|
| Collector to base breakdown voltage     | $V_{(BR)CBO}$  | -120 | —   | —     | V             | $I_C = -0.1\text{ mA}$ , $I_E = 0$                 |
| Collector to emitter breakdown voltage  | $V_{(BR)CEO}$  | -120 | —   | —     | V             | $I_C = -25\text{ mA}$ , $R_{BE} = \infty$          |
| Emitter to base breakdown voltage       | $V_{(BR)EBO}$  | -7   | —   | —     | V             | $I_E = -50\text{ mA}$ , $I_C = 0$                  |
| Collector cutoff current                | $I_{CBO}$      | —    | —   | -10   | $\mu\text{A}$ | $V_{CB} = -100\text{ V}$ , $I_E = 0$               |
|   | $I_{CEO}$      | —    | —   | -10   |               | $V_{CE} = -100\text{ V}$ , $R_{BE} = \infty$       |
| DC current transfer ratio               | $h_{FE}$       | 1000 | —   | 20000 |               | $V_{CE} = -3\text{ V}$ , $I_C = -5\text{ A}^{*1}$  |
| Collector to emitter saturation voltage | $V_{CE(sat)1}$ | —    | —   | -1.5  | V             | $I_C = -5\text{ A}$ , $I_B = 10\text{ mA}^{*1}$    |
|   | $V_{CE(sat)2}$ | —    | —   | -3.0  |               | $I_C = -10\text{ A}$ , $I_B = -100\text{ mA}^{*1}$ |
| Base to emitter saturation voltage      | $V_{BE(sat)1}$ | —    | —   | -2.0  | V             | $I_C = -5\text{ A}$ , $I_B = 10\text{ mA}^{*1}$    |
|   | $V_{BE(sat)2}$ | —    | —   | -3.5  |               | $I_C = -10\text{ A}$ , $I_B = -100\text{ mA}^{*1}$ |
| C to E diode forward voltage            | $V_D$          | —    | —   | 3.0   | V             | $I_D = 10\text{ A}^{*1}$                           |

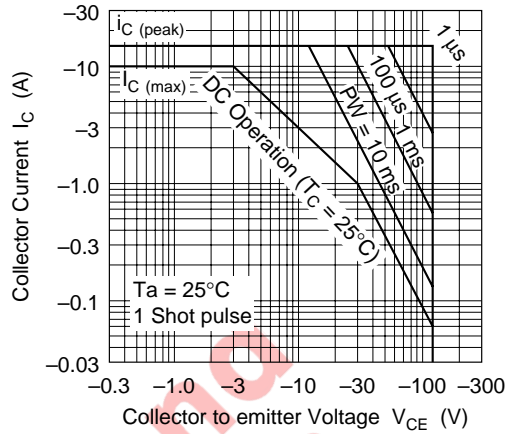
Note: 1. Pulse Test.

See switching characteristic curve of 2SB955(K).

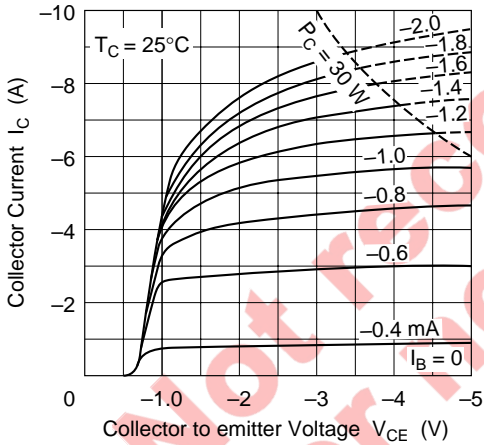
Maximum Collector Dissipation Curve



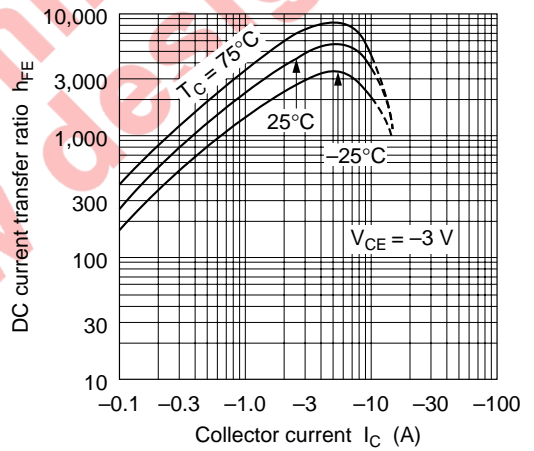
Area of Safe Operation

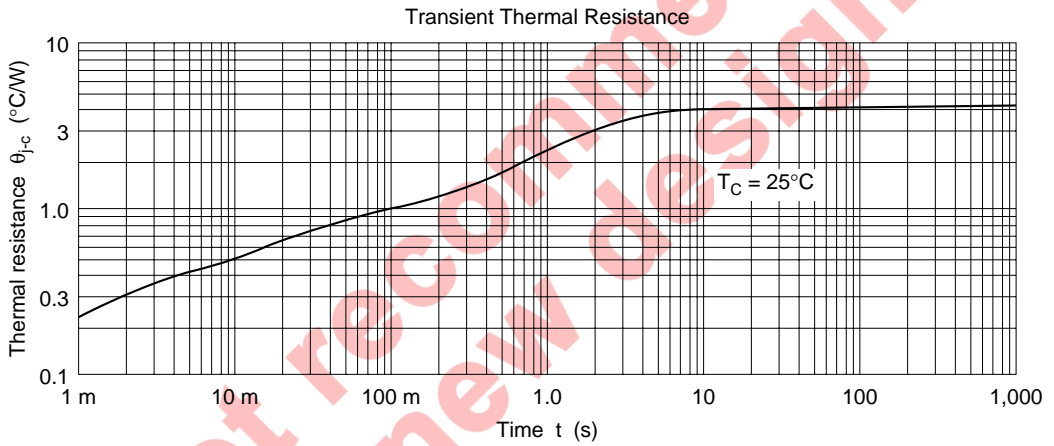
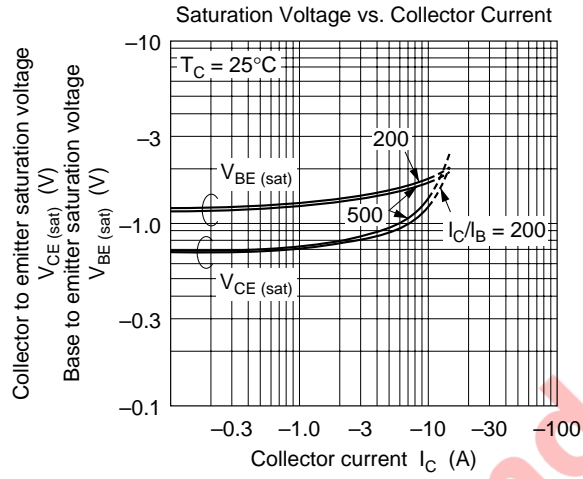


Typical Output Characteristics



DC Current Transfer Ratio vs. Collector Current





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