

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!

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.

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# 2SD787, 2SD788

Silicon NPN Epitaxial

**RENESAS**

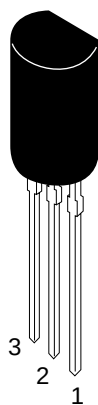
ADE-208-1139 (Z)  
1st. Edition  
Mar. 2001

## Application

- Low frequency power amplifier
- Complementary pair with 2SB738 and 2SB739

## Outline

TO-92MOD



1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings (Ta = 25°C)

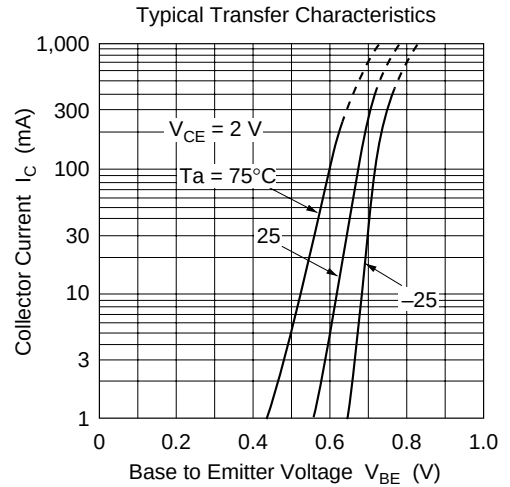
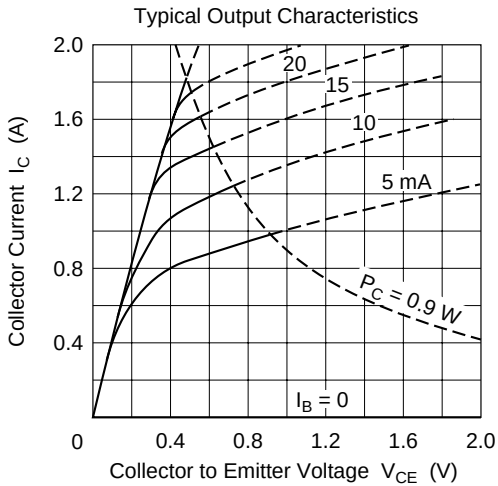
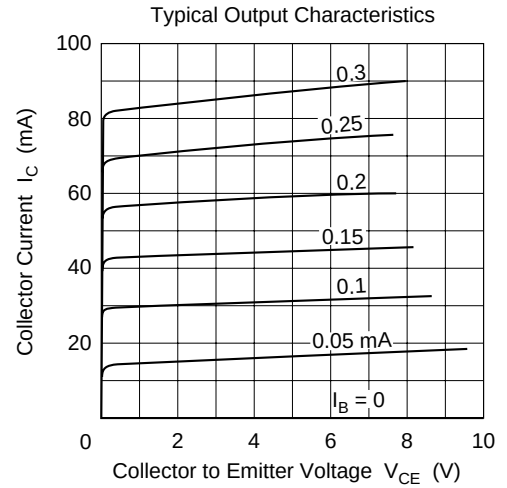
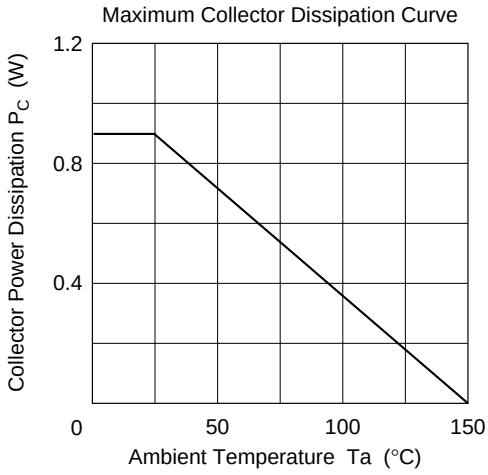
| Item                         | Symbol    | 2SD787      | 2SD788      | Unit |
|------------------------------|-----------|-------------|-------------|------|
| Collector to base voltage    | $V_{CBO}$ | 20          | 20          | V    |
| Collector to emitter voltage | $V_{CEO}$ | 16          | 20          | V    |
| Emitter to base voltage      | $V_{EBO}$ | 6           | 6           | V    |
| Collector current            | $I_C$     | 2           | 2           | A    |
| Collector power dissipation  | $P_C$     | 0.9         | 0.9         | W    |
| Junction temperature         | $T_j$     | 150         | 150         | °C   |
| Storage temperature          | $T_{stg}$ | −55 to +150 | −50 to +150 | °C   |

Electrical Characteristics (Ta = 25°C)

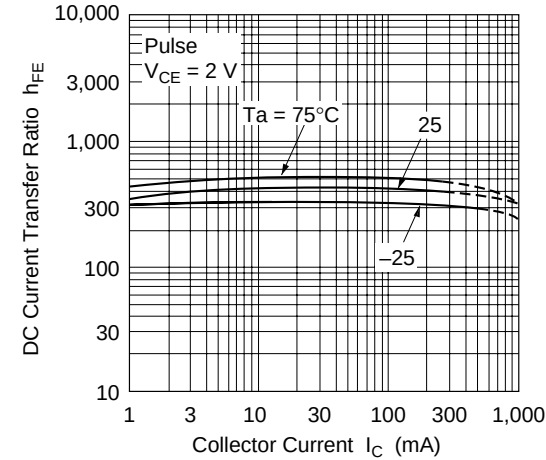
| Item                                    | Symbol        | 2SD787 |     |     | 2SD788 |     |     | Unit          | Test conditions                                            |
|-----------------------------------------|---------------|--------|-----|-----|--------|-----|-----|---------------|------------------------------------------------------------|
|                                         |               | Min    | Typ | Max | Min    | Typ | Max |               |                                                            |
| Collector to base breakdown voltage     | $V_{(BR)CBO}$ | 20     | —   | —   | 20     | —   | —   | V             | $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$                  |
| Collector to emitter breakdown voltage  | $V_{(BR)CEO}$ | 16     | —   | —   | 20     | —   | —   | V             | $I_C = 1\text{ mA}$ , $R_{BE} = \infty$                    |
| Emitter to base breakdown voltage       | $V_{(BR)EBO}$ | 6      | —   | —   | 6      | —   | —   | V             | $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$                  |
| Collector cutoff current                | $I_{CBO}$     | —      | —   | 2   | —      | —   | 2   | $\mu\text{A}$ | $V_{CB} = 16\text{ V}$ , $I_E = 0$                         |
| Emitter cutoff current                  | $I_{EBO}$     | —      | —   | 0.2 | —      | —   | 0.2 | $\mu\text{A}$ | $V_{EB} = 6\text{ V}$ , $I_C = 0$                          |
| DC current transfer ratio               | $h_{FE}^{*1}$ | 100    | —   | 800 | 100    | —   | 800 |               | $V_{CE} = 2\text{ V}$ , $I_C = 0.1\text{ A}$               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | —      | —   | 0.3 | —      | —   | 0.3 | V             | $I_C = 1\text{ A}$ , $I_B = 0.1\text{ A}$                  |
| Gain bandwidth product                  | $f_T$         | —      | 100 | —   | —      | 100 | —   | MHz           | $V_{CE} = 2\text{ V}$ ,<br>$I_C = 10\text{ mA}$            |
| Collector output capacitance            | $C_{ob}$      | —      | 20  | —   | —      | 20  | —   | pF            | $V_{CB} = 10\text{ V}$ , $I_E = 0$ ,<br>$f = 1\text{ MHz}$ |

Note: 1. The 2SD787 and 2SD788 are grouped by  $h_{FE}$  as follows.

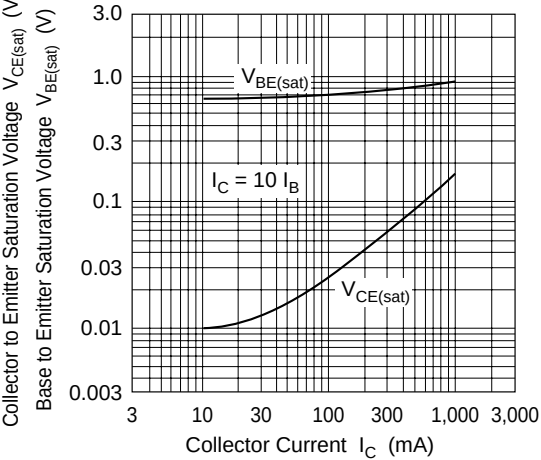
| B          | C          | D          | E          |
|------------|------------|------------|------------|
| 100 to 200 | 160 to 320 | 250 to 500 | 400 to 800 |



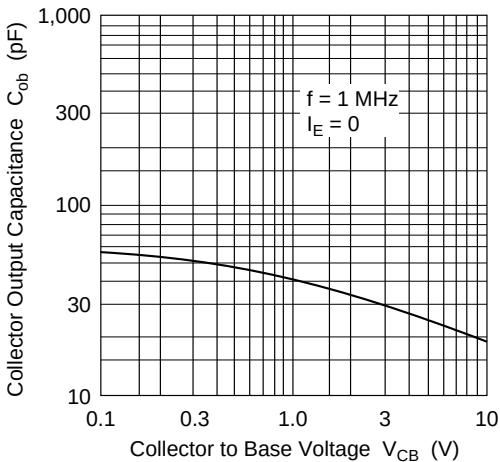
DC Current Transfer Ratio vs.  
Collector Current



Saturation Voltage vs. Collector Current

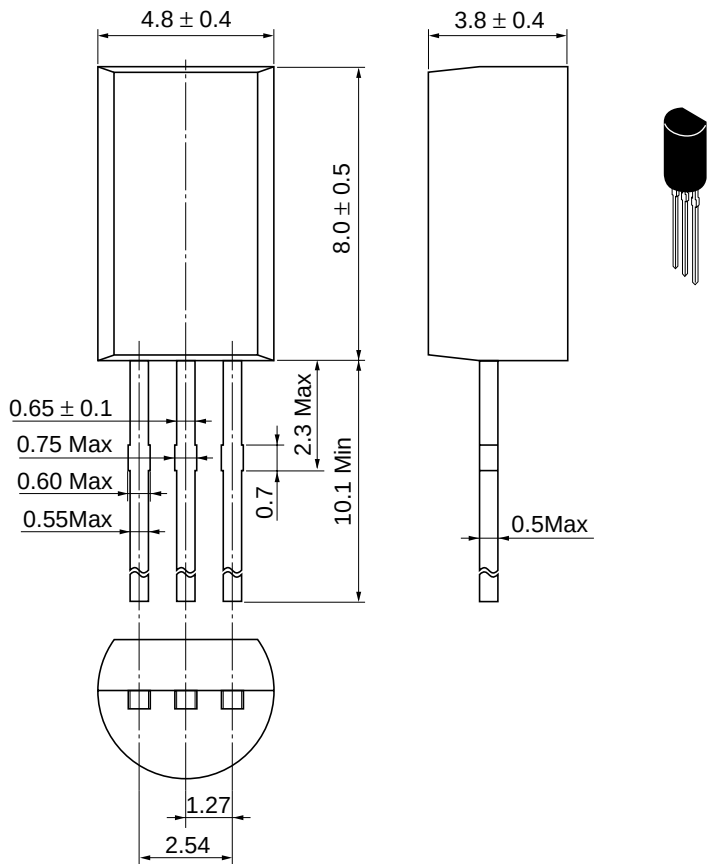


Collector Output Capacitance vs.  
Collector to Base Voltage



Package Dimensions

As of January, 2001  
Unit: mm



|                        |           |
|------------------------|-----------|
| Hitachi Code           | TO-92 Mod |
| JEDEC                  | —         |
| EIAJ                   | Conforms  |
| Mass (reference value) | 0.35 g    |

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# HITACHI

## Hitachi, Ltd.

Semiconductor & Integrated Circuits.

Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

|     |              |   |                                                                                             |
|-----|--------------|---|---------------------------------------------------------------------------------------------|
| URL | NorthAmerica | : | <a href="http://semiconductor.hitachi.com/">http://semiconductor.hitachi.com/</a>           |
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## For further information write to:

Hitachi Semiconductor  
(America) Inc.

179 East Tasman Drive,  
San Jose, CA 95134

Tel: <1> (408) 433-1990

Fax: <1> (408) 433-0223

Hitachi Europe GmbH  
Electronic Components Group

Dornacher Straße 3  
D-85622 Feldkirchen, Munich

Germany

Tel: <49> (89) 9 9180-0

Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.  
Electronic Components Group.

Whitebrook Park

Lower Cookham Road

Maidenhead

Berkshire SL6 8YA, United Kingdom

Tel: <44> (1628) 585000

Fax: <44> (1628) 585160

Hitachi Asia Ltd.

Hitachi Tower

16 Collyer Quay #20-00,

Singapore 049318

Tel: <65>-538-6533/538-8577

Fax: <65>-538-6933/538-3877

URL: <http://www.hitachi.com.sg>

Hitachi Asia Ltd.

(Taipei Branch Office)

4/F, No. 167, Tun Hwa North Road,

Hung-Kuo Building,

Taipei (105), Taiwan

Tel: <886>-(2)-2718-3666

Fax: <886>-(2)-2718-8180

Telex: 23222 HAS-TP

URL: <http://www.hitachi.com.tw>

Hitachi Asia (Hong Kong) Ltd.

Group III (Electronic Components)

7/F., North Tower,

World Finance Centre,

Harbour City, Canton Road

Tsim Sha Tsui, Kowloon,

Hong Kong

Tel: <852>-(2)-735-9218

Fax: <852>-(2)-730-0281

URL: <http://www.hitachi.com.hk>