

To all our customers

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

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# 2SD2122(L)/(S), 2SD2123(L)/(S)

Silicon NPN Epitaxial

**RENESAS**

ADE-208-926 (Z)  
1st. Edition  
September 2000

## Application

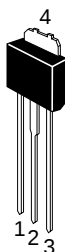
Low frequency power amplifier complementary pair with 2SB1409(L)/(S)

## Outline

DPAK



S Type



L Type

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

## 2SD2122(L)/(S), 2SD2123(L)/(S)

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

| Item                         | Symbol        | Ratings        |                | Unit |
|------------------------------|---------------|----------------|----------------|------|
|                              |               | 2SD2122(L)/(S) | 2SD2123(L)/(S) |      |
| Collector to base voltage    | $V_{CBO}$     | 180            | 180            | V    |
| Collector to emitter voltage | $V_{CEO}$     | 120            | 160            | V    |
| Emitter to base voltage      | $V_{EBO}$     | 5              | 5              | V    |
| Collector current            | $I_C$         | 1.5            | 1.5            | A    |
| Collector peak current       | $I_{C(peak)}$ | 3              | 3              | A    |
| Collector power dissipation  | $P_C^{*1}$    | 18             | 18             | W    |
| Junction temperature         | $T_j$         | 150            | 150            | °C   |
| Storage temperature          | $T_{stg}$     | –55 to +150    | –55 to +150    | °C   |

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

### Electrical Characteristics (Ta = 25°C)

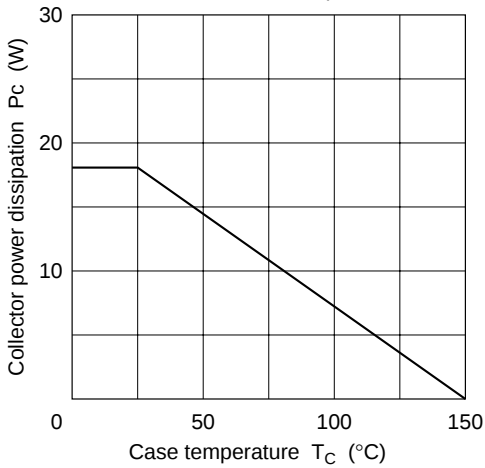
| Item                                    | Symbol         | 2SD2122(L)/(S) |     |     | 2SD2123(L)/(S) |     |     | Unit          | Test conditions                                            |
|-----------------------------------------|----------------|----------------|-----|-----|----------------|-----|-----|---------------|------------------------------------------------------------|
|                                         |                | Min            | Typ | Max | Min            | Typ | Max |               |                                                            |
| Collector to base breakdown voltage     | $V_{(BR)CBO}$  | 180            | —   | —   | 180            | —   | —   | V             | $I_C = 1\text{ mA}$ , $I_E = 0$                            |
| Collector to emitter breakdown voltage  | $V_{(BR)CEO}$  | 120            | —   | —   | 160            | —   | —   | V             | $I_C = 10\text{ mA}$ , $R_{BE} = \infty$                   |
| Emitter to base breakdown voltage       | $V_{(BR)EBO}$  | 5              | —   | —   | 5              | —   | —   | V             | $I_E = 1\text{ mA}$ , $I_C = 0$                            |
| Collector cutoff current                | $I_{CBO}$      | —              | —   | 10  | —              | —   | 10  | $\mu\text{A}$ | $V_{CB} = 160\text{ V}$ , $I_E = 0$                        |
| DC current transfer ratio               | $h_{FE1}^{*2}$ | 60             | —   | 200 | 60             | —   | 200 | A             | $V_{CE} = 5\text{ V}$ , $I_C = 150\text{ mA}^{*1}$         |
|                                         | $h_{FE2}$      | 30             | —   | —   | 30             | —   | —   |               | $V_{CE} = 5\text{ V}$ , $I_C = 500\text{ mA}^{*1}$         |
| Collector to emitter saturation voltage | $V_{CE(sat)}$  | —              | —   | 1   | —              | —   | 1   | V             | $I_C = 500\text{ mA}$ ,<br>$I_B = 50\text{ mA}^{*1}$       |
| Base to emitter voltage                 | $V_{BE}$       | —              | —   | 1.5 | —              | —   | 1.5 | V             | $V_{CE} = 5\text{ V}$ , $I_C = 150\text{ mA}^{*1}$         |
| Gain bandwidth product                  | $f_T$          | —              | 180 | —   | —              | 180 | —   | MHz           | $V_{CE} = 5\text{ V}$ , $I_C = 150\text{ mA}^{*1}$         |
| Collector output capacitance            | $C_{ob}$       | —              | 14  | —   | —              | 14  | —   | pF            | $V_{CB} = 10\text{ V}$ , $I_E = 0$ ,<br>$f = 1\text{ MHz}$ |

Notes: 1. Pulse test

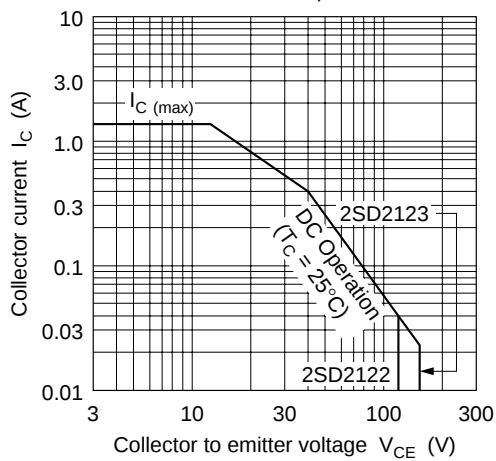
2. The 2SD2122(L)/(S) and 2SD2123(L)/(S) are grouped by  $h_{FE1}$  as follows.

| B         | C          |
|-----------|------------|
| 60 to 120 | 100 to 200 |

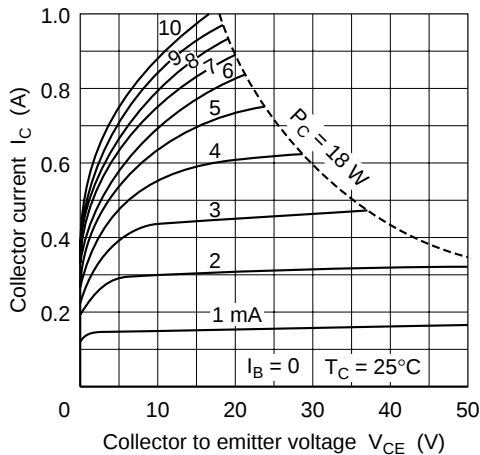
Maximum Collector Dissipation Curve



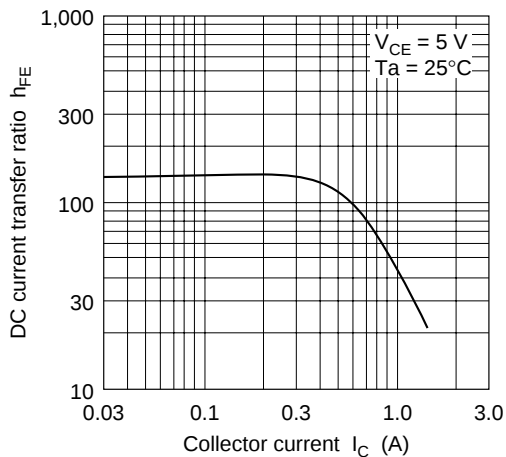
Area of Safe Operation

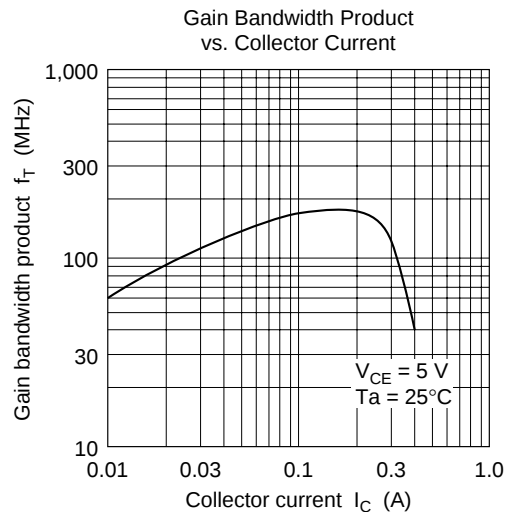
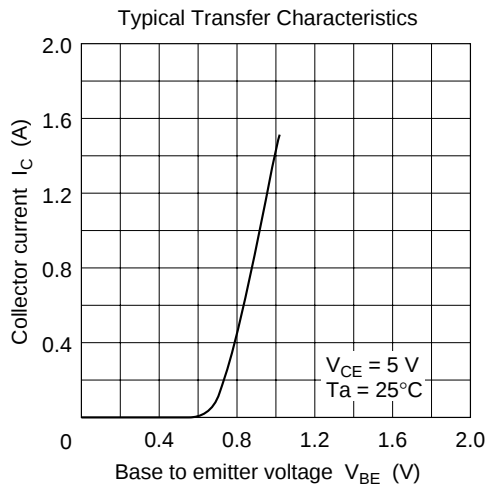
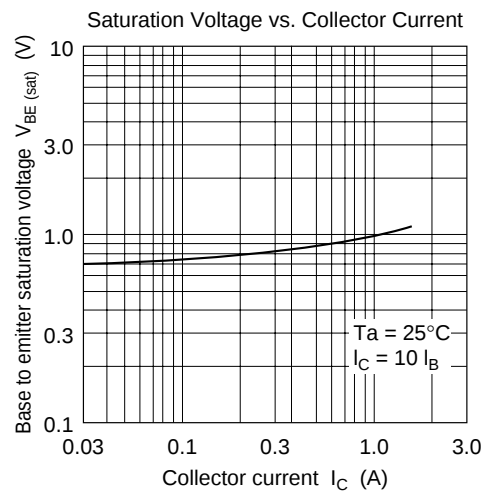
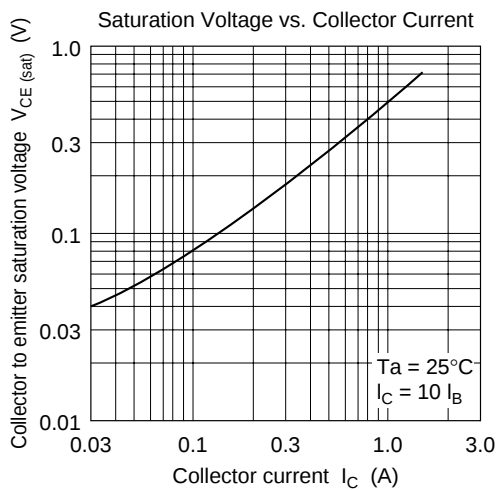


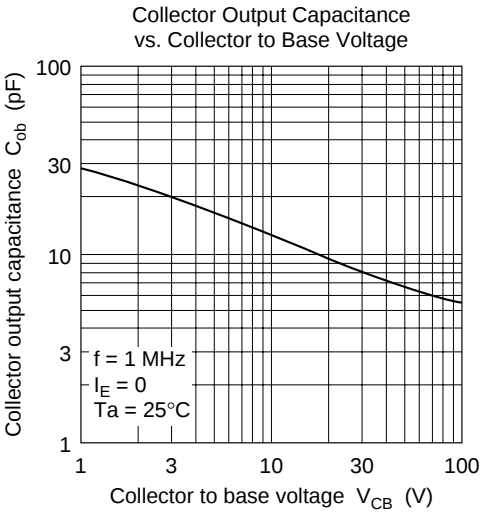
Typical Output Characteristics



DC Current Transfer Ratio vs. Collector Current







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