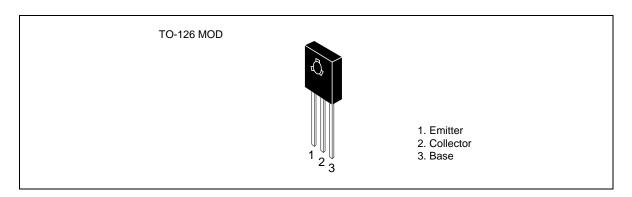
## Silicon PNP Epitaxial

## **HITACHI**

### **Application**

Low frequency high voltage amplifier complementary pair with 2SD668/A

#### Outline



### **Absolute Maximum Ratings** $(Ta = 25^{\circ}C)$

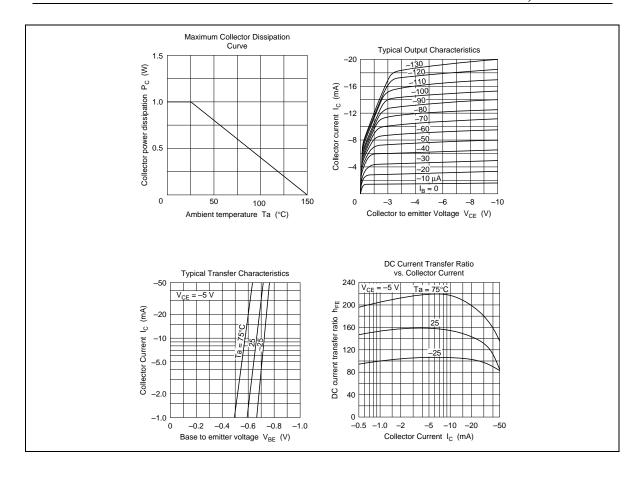
|                              |                               | Ratings     |             |      |  |
|------------------------------|-------------------------------|-------------|-------------|------|--|
| Item                         | Symbol                        | 2SB648      | 2SB648A     | Unit |  |
| Collector to base voltage    | V <sub>CBO</sub>              | -180        | -180        | V    |  |
| Collector to emitter voltage | V <sub>CEO</sub>              | -120        | -160        | V    |  |
| Emitter to base voltage      | $V_{\scriptscriptstyle{EBO}}$ | <b>-</b> 5  | <b>-</b> 5  | V    |  |
| Collector current            | I <sub>c</sub>                | -50         | <b>-</b> 50 | mA   |  |
| Collector peak current       | I <sub>C(peak)</sub>          | -100        | -100        | mA   |  |
| Collector power dissipation  | P <sub>c</sub>                | 1           | 1           | W    |  |
| Junction temperature         | Tj                            | 150         | 150         | °C   |  |
| Storage temperature          | Tstg                          | -55 to +150 | -55 to +150 | °C   |  |

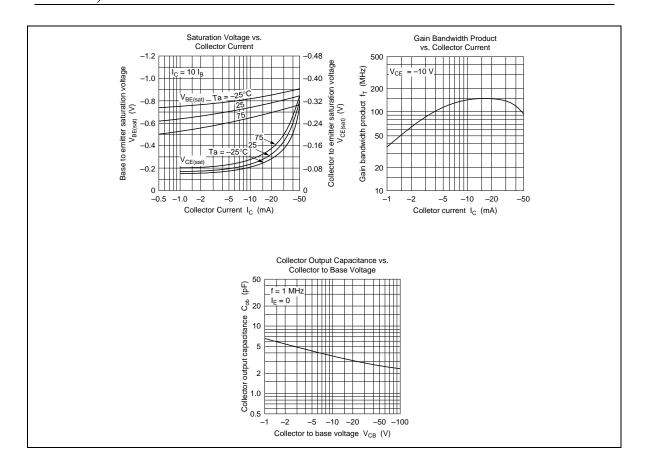
#### **Electrical Characteristics** (Ta = 25°C)

|   |                                  | 2SB6       | 48  |      | 2SB648A        |     |      |      |  |
|---|----------------------------------|------------|-----|------|----------------|-----|------|------|--|
| Item                                    | Symbol                           | Min        | Тур | Max  | Min            | Тур | Max  | Unit | Test conditions                                      |
| Collector to base breakdown voltage     | $V_{\text{(BR)CBO}}$             | -180       | _   | _    | -180           | _   | _    | V    | $I_{c} = -10 \mu\text{A},  I_{E} = 0$                |
| Collector to emitter breakdown voltage  | $V_{\scriptscriptstyle (BR)CEO}$ | -120       | _   | _    | -160           | _   | _    | V    | $I_{c} = -1 \text{ mA}, R_{BE} = \infty$             |
| Emitter to base breakdown voltage       | $V_{\text{(BR)EBO}}$             | <b>-</b> 5 | _   | _    | <del>-</del> 5 | _   | _    | V    | $I_{\rm E} = -10  \mu \text{A},  I_{\rm C} = 0$      |
| Collector cutoff current                | I <sub>CBO</sub>                 | _          | _   | -10  | _              | _   | -10  | μΑ   | $V_{CB} = -160 \text{ V}, I_{E} = 0$                 |
| DC current transfer ratio               | h <sub>FE1</sub> *1              | 60         | _   | 320  | 60             | _   | 200  |      | $V_{CE} = -5 \text{ V},$ $I_{C} = -10 \text{ mA}$    |
|   | h <sub>FE2</sub>                 | 30         | _   | _    | 30             | _   | _    |      | $V_{CE} = -5 \text{ V}, I_{C} = -1 \text{ mA}$       |
| Collector to emitter saturation voltage | $V_{\text{CE(sat)}}$             | _          | _   | -2   | _              | _   | -2   | V    | $I_{c} = -30 \text{ mA},$<br>$I_{B} = -3 \text{ mA}$ |
| Base to emitter voltage                 | $V_{BE}$                         | _          | _   | -1.5 | _              | _   | -1.5 | V    | $V_{ce} = -5 \text{ V},$ $I_c = -10 \text{ mA}$      |
| Gain bandwidth product                  | $f_{\scriptscriptstyle T}$       | _          | 140 | _    | _              | 140 | _    | MHz  | $V_{ce} = -10 \text{ V},$ $I_{c} = -10 \text{ mA}$   |
| Collector output capacitance            | Cob                              | _          | 4.5 | _    | _              | 4.5 | _    | pF   | $V_{CB} = -10 \text{ V}, I_{E} = 0,$<br>f = 1 MHz    |

Note: 1. The 2SB648 and 2SB648A are grouped by  $h_{\text{\tiny FE1}}$  as follows.

|         | В         | С          | D          |
|---------|-----------|------------|------------|
| 2SB648  | 60 to 120 | 100 to 200 | 160 to 320 |
| 2SB648A | 60 to 120 | 100 to 200 | _          |





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