



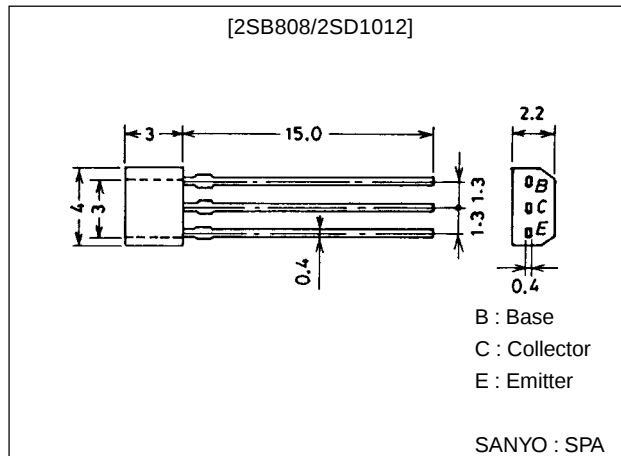
## 2SB808/2SD1012

### Low-Voltage Large-Current Amplifier Applications

#### Package Dimensions

unit:mm

2033



() : 2SB808

#### Specifications

##### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter                    | Symbol    | Conditions | Ratings     | Unit             |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |            | (-)20       | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |            | (-)15       | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |            | (-)5        | V                |
| Collector Current            | $I_C$     |            | (-)0.7      | A                |
| Collector Current (Pulse)    | $I_{CP}$  |            | (-)1.5      | A                |
| Collector Dissipation        | $P_C$     |            | 250         | mW               |
| Junction Temperature         | $T_J$     |            | 125         | $^\circ\text{C}$ |
| Storage Temperature          | $T_{stg}$ |            | -55 to +125 | $^\circ\text{C}$ |

##### Electrical Characteristics at $T_a = 25^\circ\text{C}$

| Parameter                      | Symbol    | Conditions                                       | Ratings |      |        | Unit          |
|--------------------------------|-----------|--------------------------------------------------|---------|------|--------|---------------|
|                                |           |                                                  | min     | typ  | max    |               |
| Collector Cutoff Current       | $I_{CBO}$ | $V_{CB}=(-)15\text{V}, I_E=0$                    |         |      | (-)1.0 | $\mu\text{A}$ |
| Emitter Cutoff Current         | $I_{EBO}$ | $V_{EB}=(-)4\text{V}, I_C=0$                     |         |      | (-)1.0 | $\mu\text{A}$ |
| DC Current Gain                | $h_{FE1}$ | $V_{CE}=(-)2\text{V}, I_C=(-)50\text{mA}$        | 160*    |      | 960*   |               |
|                                | $h_{FE2}$ | $V_{CE}=(-)2\text{V}, I_C=(-)500\text{mA Pulse}$ | 80      |      |        |               |
| Gain-Bandwidth Product         | $f_T$     | $V_{CE}=(-)10\text{V}, I_C=(-)50\text{mA}$       |         | 250  |        | MHz           |
| Common Base Output Capacitance | $C_{ob}$  | $V_{CB}=(-)10\text{V}, f=1\text{MHz}$            |         | (13) |        | pF            |
|                                |           |                                                  |         | 8    |        | pF            |

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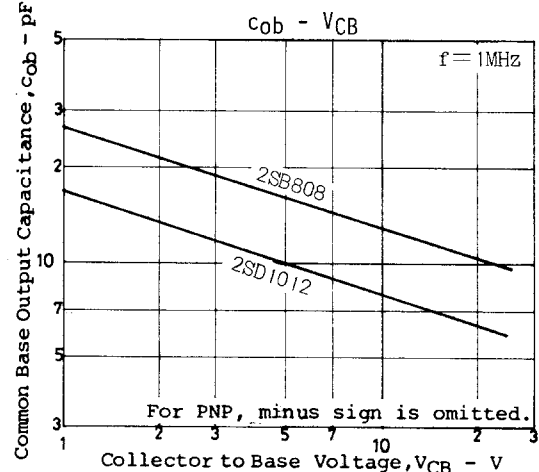
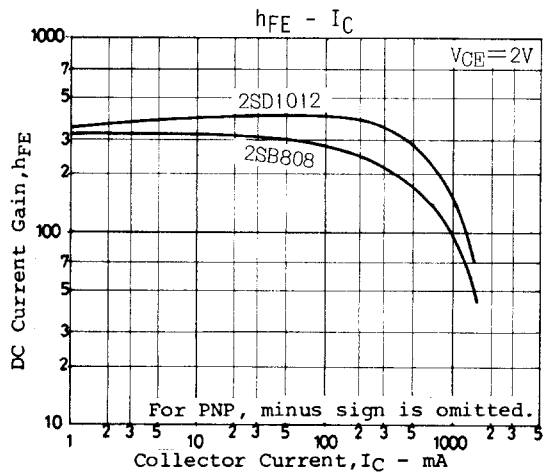
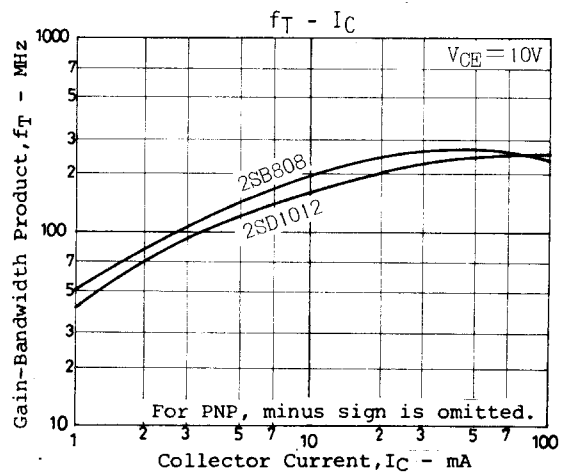
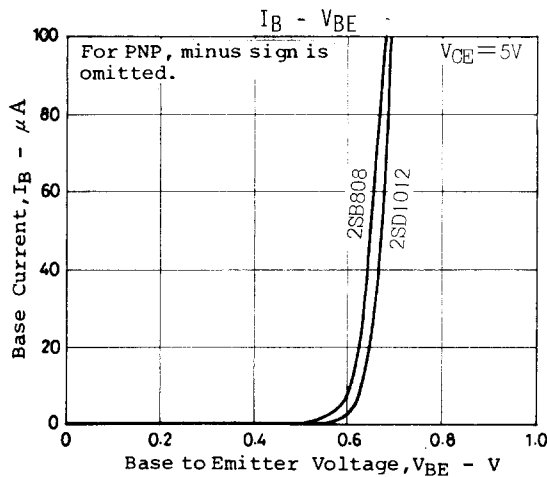
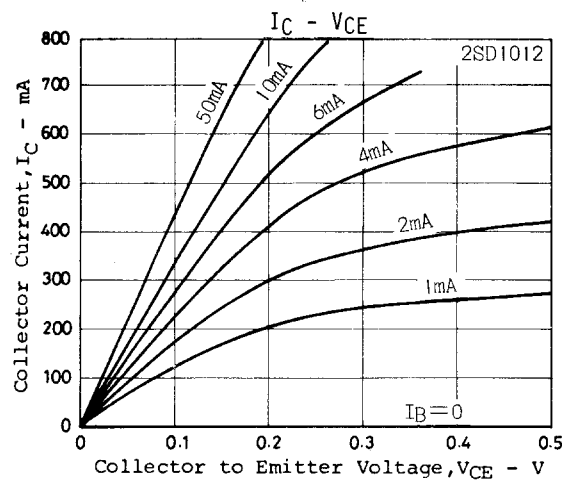
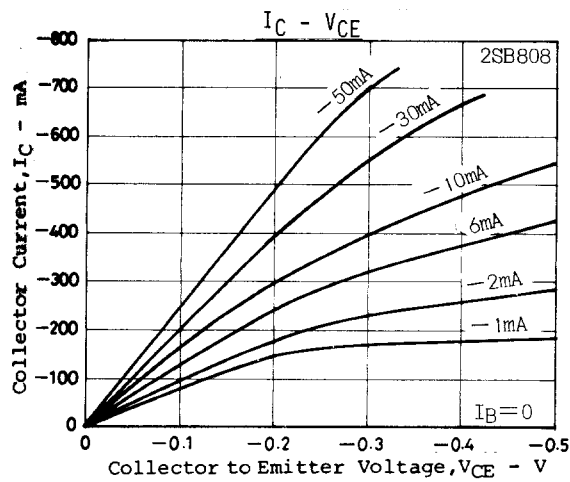
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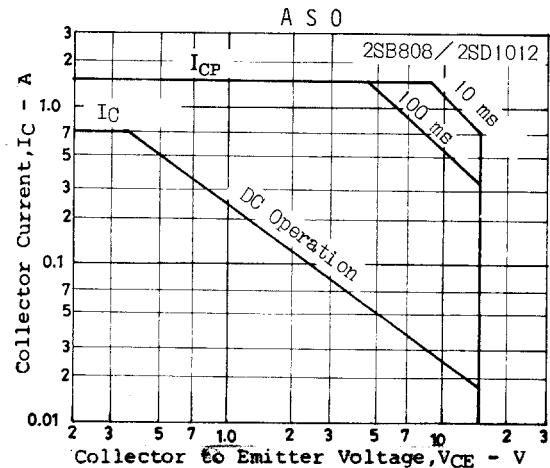
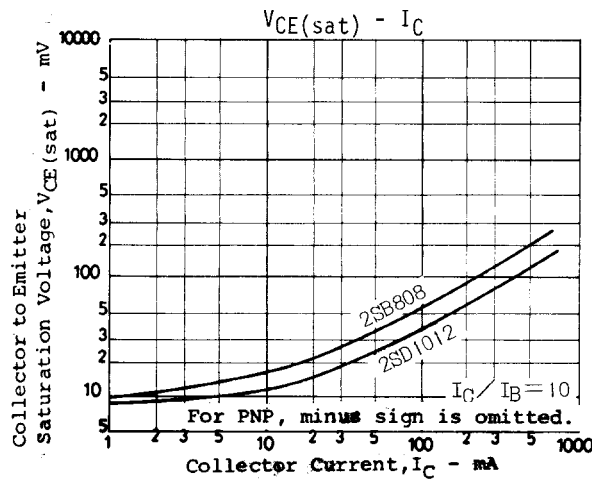
## 2SB808/2SD1012

| Parameter                               | Symbol          | Conditions                  | Ratings |        |        | Unit |
|-----------------------------------------|-----------------|-----------------------------|---------|--------|--------|------|
|                                         |                 |                             | min     | typ    | max    |      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}^1$ | $I_C=(-)5mA, I_B=(-)0.5mA$  |         | (-15)  | (-35)  | mV   |
|                                         |                 |                             |         | 10     | 25     | mV   |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}^2$ | $I_C=(-)100mA, I_B=(-)10mA$ |         | (-60)  | (-120) | mV   |
|                                         |                 |                             |         | 30     | 80     | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$   | $I_C=(-)100mA, I_B=(-)10mA$ |         | (-)0.8 | (-)1.2 | V    |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$   | $I_C=(-)10\mu A, I_E=0$     | (-)20   |        |        | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$   | $I_C=(-)1mA, R_{BE}=\infty$ | (-)15   |        |        | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$   | $I_E=(-)10\mu A, I_C=0$     | (-)5    |        |        | V    |

\* : The 2SB808/2SD1012 are classified by 50mA  $h_{FE}$  as follows :

|         |           |           |           |
|---------|-----------|-----------|-----------|
| 2SB808  | 160 F 320 | 280 G 560 |           |
| 2SD1012 | 160 F 320 | 280 G 560 | 480 H 960 |

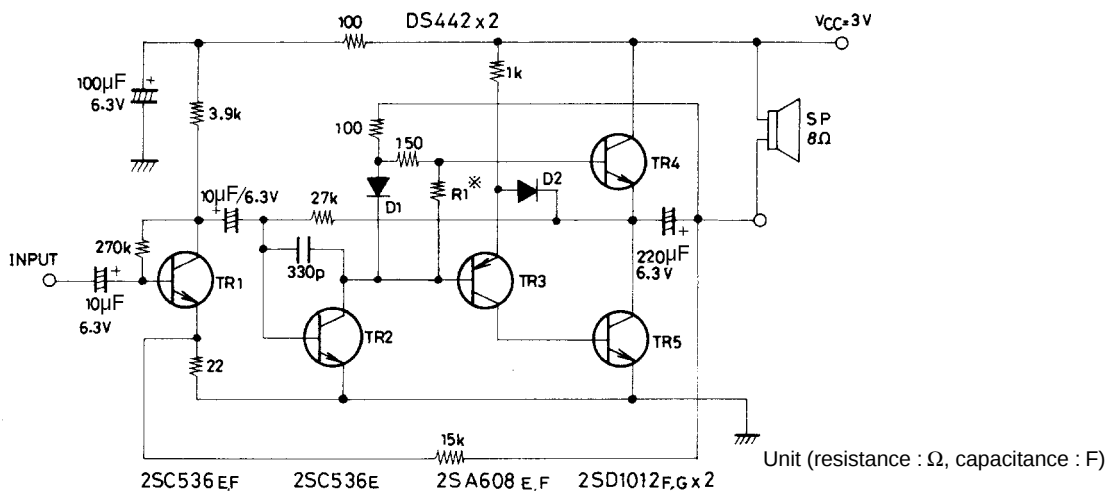




**Sample Application Circuit :** Low-voltage 3V ( $P_O$  120mW) ITL-OTL power amplifier.

· Circuit configuration

For obtaining an output of more than 100mW, the middle-point voltage at the output stage and the collector voltage of the driver transistor must be  $V_{CC}/2$ . Therefore, the output stage is of quasi complementary configuration composed of npn/npn transistors. The phase is reversed by the 2SA608 and the middle-point voltage are the output stage and the collector voltage of the driver transistor are more to be  $V_{CC}/2$  so that the output can be maximized.

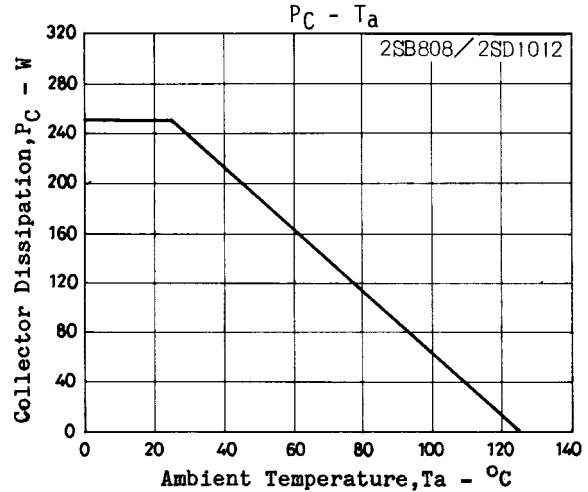
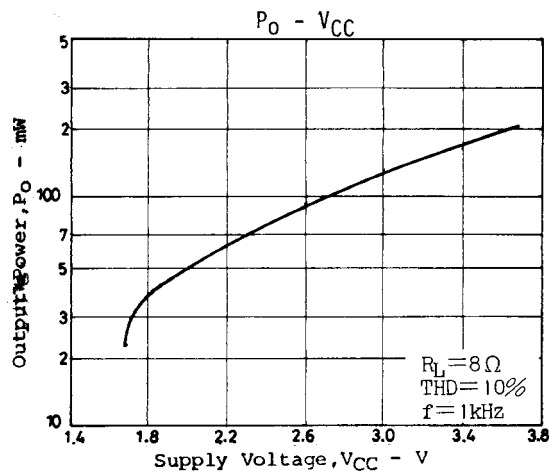
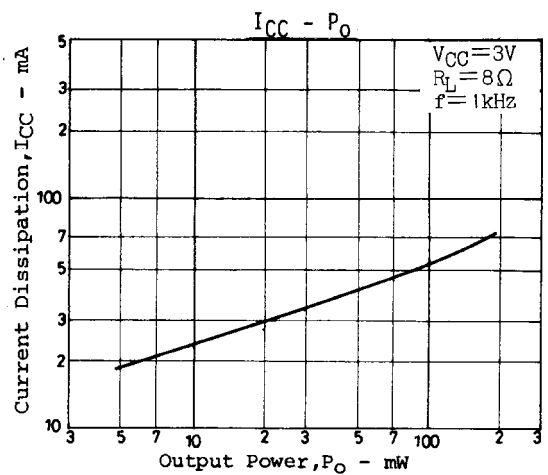
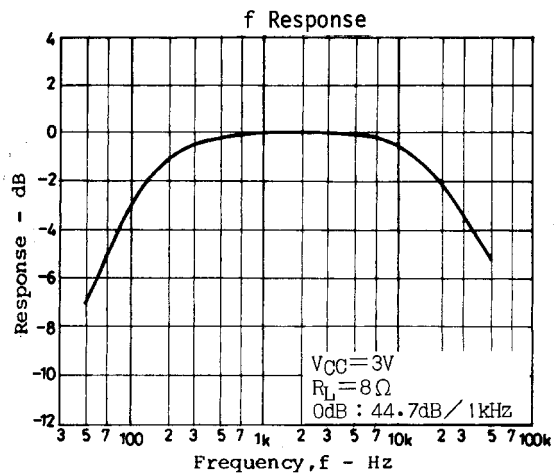
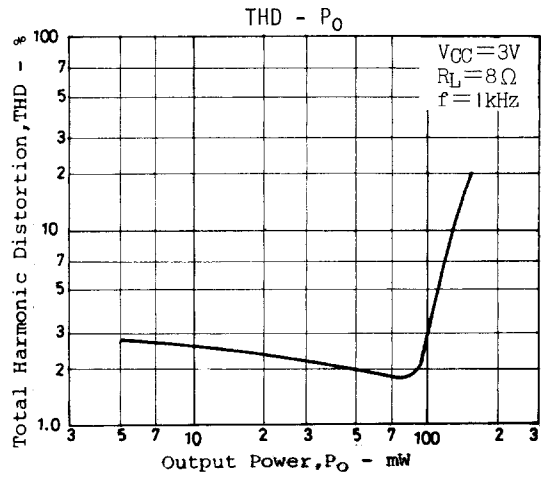
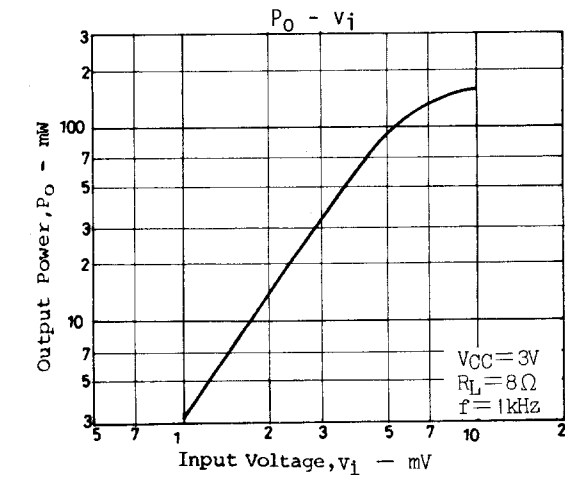


$R_1$  : Used control idle current  
 For  $R_1=820\Omega$ , use rank F for [TR4, 5 (2SD1012)].  
 For  $R_1=680\Omega$ , use rank G for [TR4, 5 (2SD1012)].

**Main Specifications**

| Characteristic            | Conditions                           | f=400Hz      | f=1kHz       | Unit       |
|---------------------------|--------------------------------------|--------------|--------------|------------|
| Current dissipation       | Quiescent, total current dissipation | 11.0 to 15.5 | 11.0 to 15.5 | mA         |
| Output power              | THD=10%                              | 120 to 125   | 127 to 130   | mW         |
| Voltage gain              | $P_O=10\text{mW}$                    | 43.3 to 45.5 | 43.5 to 45.7 | dB         |
| Total harmonic distortion | $P_O=50\text{mW}$                    | 1.4 to 2.6   | 1.3 to 2.5   | %          |
| Input resistance          | $P_O=10\text{mW}$                    | 10.4 to 20.5 | 11.0 to 21.0 | k $\Omega$ |

Note : for above-mentioned  $h_{FE}$  rank.



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