

**TRANSISTOR (PNP)****FEATURES**

- Low  $V_{CE(sat)}$ : -0.2V(Typ)  $I_C/I_B=-500mA/-50mA$
- Compliments 2SD1664

**MAXIMUM RATINGS** ( $T_A=25^{\circ}C$  unless otherwise noted)

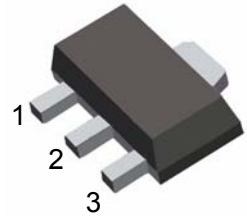
| Symbol    | Parameter                     | Value   | Units       |
|-----------|-------------------------------|---------|-------------|
| $V_{CBO}$ | Collector-Base Voltage        | -40     | V           |
| $V_{CEO}$ | Collector-Emitter Voltage     | -32     | V           |
| $V_{EBO}$ | Emitter-Base Voltage          | -5      | V           |
| $I_C$     | Collector Current -Continuous | -1      | A           |
| $P_C$     | Collector Power Dissipation   | 500     | mW          |
| $T_J$     | Junction Temperature          | 150     | $^{\circ}C$ |
| $T_{stg}$ | Storage Temperature           | -55-150 | $^{\circ}C$ |

**SOT-89**

1. BASE

2. COLLECTOR

3. EMITTER

**ELECTRICAL CHARACTERISTICS** ( $T_{amb}=25^{\circ}C$  unless otherwise specified)

| Parameter                            | Symbol        | Test conditions                  | MIN | TYP  | MAX  | UNIT    |
|--------------------------------------|---------------|----------------------------------|-----|------|------|---------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=-50\mu A, I_E=0$            | -40 |      |      | V       |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=-1mA, I_B=0$                | -32 |      |      | V       |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=-50\mu A, I_C=0$            | -5  |      |      | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=-20V, I_E=0$             |     |      | -0.5 | $\mu A$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=-4V, I_C=0$              |     |      | -0.5 | $\mu A$ |
| DC current gain                      | $h_{FE}$      | $V_{CE}=-3V, I_C=-100mA$         | 82  |      | 390  |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=-500mA, I_B=-50mA$          |     | -0.2 | -0.5 | V       |
| Transition frequency                 | $f_T$         | $V_{CE}=-5V, I_C=-50mA, f=30MHz$ |     | 150  |      | MHz     |
| Collector output capacitance         | $C_{ob}$      | $V_{CB}=-10V, I_E=0, f=1MHz$     |     | 20   | 30   | pF      |

**CLASSIFICATION OF  $h_{FE}$** 

| Rank    | P      | Q       | R       |
|---------|--------|---------|---------|
| Range   | 82-180 | 120-270 | 180-390 |
| Marking | BAP    | BAQ     | BAR     |

# TRANSISTOR (PNP)

## Typical Characteristics

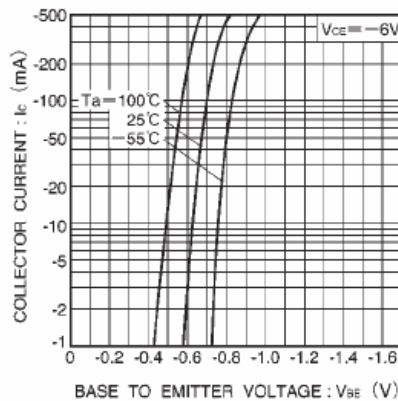


Fig.1 Grounded emitter propagation characteristics

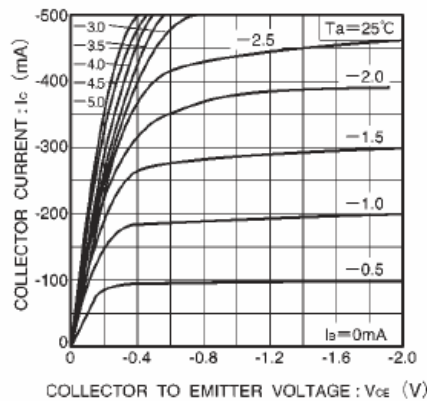


Fig.2 Grounded emitter output characteristics

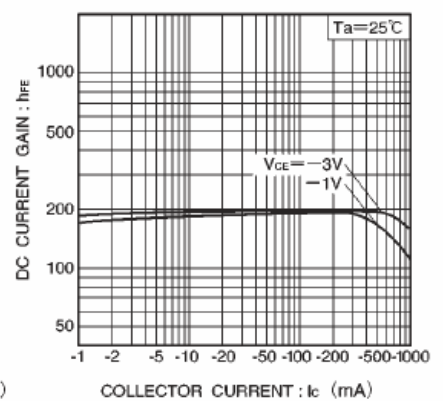


Fig.3 DC current gain vs. collector current ( $I_c$ )

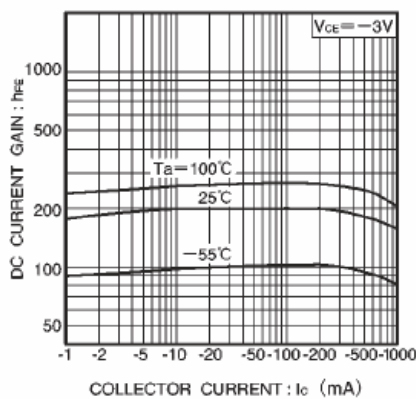


Fig.4 DC current gain vs. collector current ( $I_c$ )

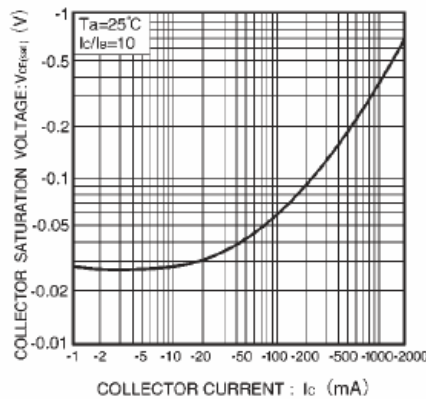


Fig.5 Collector-emitter saturation voltage vs. collector current

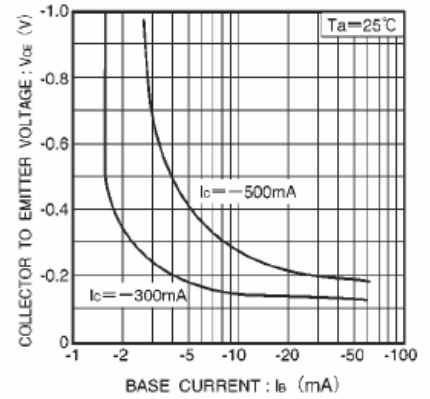


Fig.6 Collector-emitter saturation voltage vs. base current

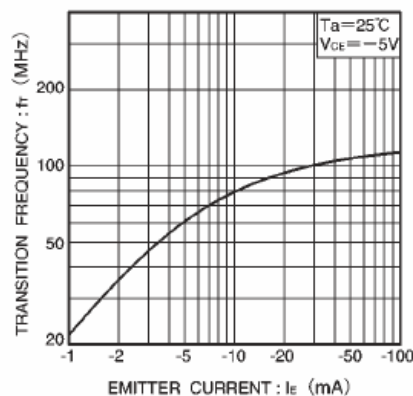


Fig.7 Gain bandwidth product vs. emitter current

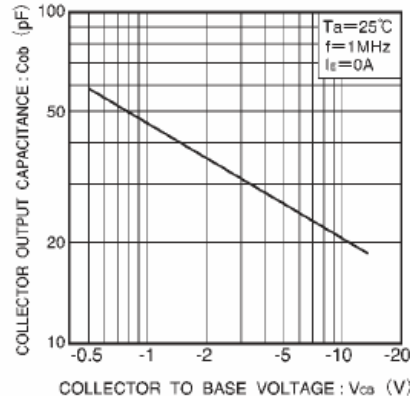


Fig.8 Collector output capacitance vs. collector-base voltage

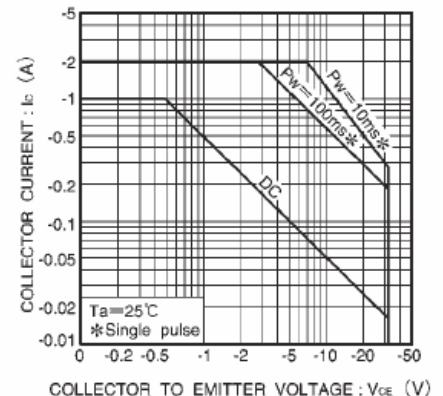


Fig.9 Safe operation area



## TRANSISTOR (PNP)

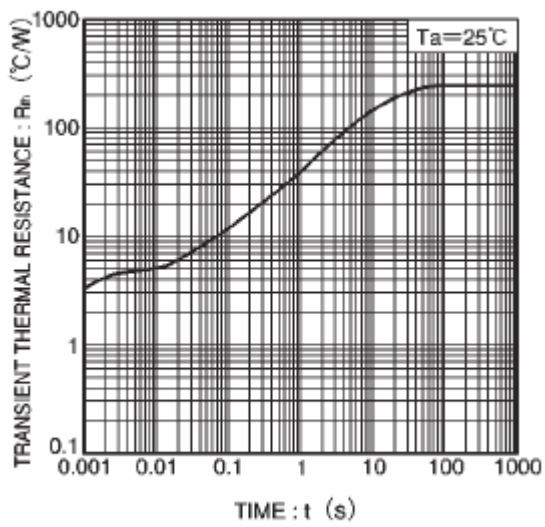
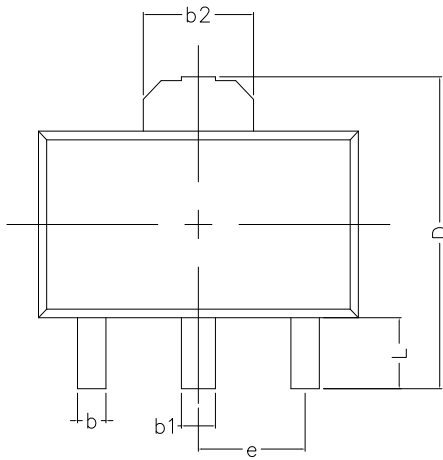
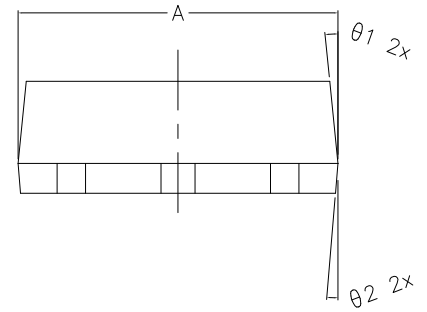
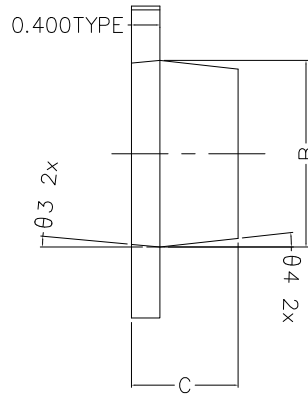


Fig.10 Transient thermal resistance

**TRANSISTOR (PNP)****SOT-89-3L Package Outline Dimensions (Units: mm)**

TOP VIEW



| COMMON DIMENSIONS<br>(UNITS OF MEASURE IS mm) |           |        |       |
|-----------------------------------------------|-----------|--------|-------|
|                                               | MIN       | NORMAL | MAX   |
| A                                             | 4.450     | 4.550  | 4.650 |
| B                                             | 2.450     | 2.550  | 2.650 |
| C                                             | 1.400     | 1.500  | 1.600 |
| D                                             | 4.100     | 4.200  | 4.300 |
| L                                             | 0.850     | 0.950  | 1.050 |
| b                                             | 0.350     | 0.400  | 0.450 |
| b1                                            | 0.430     | 0.480  | 0.530 |
| b2                                            | 1.500     | 1.550  | 1.600 |
| e                                             | 1.500TYPE |        |       |
| $\theta_1$                                    | 6° TYPE   |        |       |
| $\theta_2$                                    | 5° TYPE   |        |       |
| $\theta_3$                                    | 5° TYPE   |        |       |
| $\theta_4$                                    | 6° TYPE   |        |       |