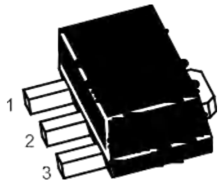
# 2SB1188U **Silicon Epitaxial Planar Transistor**

Medium power transistor



1.Base 2.Collector 3.Emitter

**SOT-89-3L**

**Marking；** P BCP
Q BCQ
R BCR

### Absolute Maximum Ratings ($T_a$ = 25 °C)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | -40 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | -32 | V |
| $V_{EBO}$ | Emitter-Base Voltage | -5 | V |
| $I_C$ | Collector Current -Continuous | -2 | A |
| $P_C$ | Collector Power Dissipation | 500 | mW |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient | 250 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance From Junction To Case | 45 | ℃/W |
| $T_J$,$T_{stg}$ | Operation Junction and Storage Temperature Range | -55~150 | ℃ |

### Characteristics at $T_a$ = 25 °C

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| DC Current Gain<br>at $-V_{CE}$ = 3 V, $-I_C$ =500 mA Current Gain Group P<br>Q<br>R | $h_{FE}$<br>$h_{FE}$<br>$h_{FE}$ | 82<br>120<br>180 | -<br>-<br>- | 180<br>270<br>390 | -<br>-<br>- |
| Collector Cutoff Current<br>at $-V_{CB}$ = 20 V | $-I_{CBO}$ | - | - | 1 | μA |
| Emitter Cutoff Current<br>at $-V_{EB}$ = 4 V | $-I_{EBO}$ | - | - | 1 | μA |
| Collector Base Breakdown Voltage<br>at $-I_C$ = 50 μA | $-V_{(BR)CBO}$ | 40 | - | - | V |
| Collector Emitter Breakdown Voltage<br>at $-I_C$ = 1 mA | $-V_{(BR)CEO}$ | 32 | - | - | V |
| Emitter Base Breakdown Voltage<br>at $-I_E$ = 50 μA | $-V_{(BR)EBO}$ | 5 | - | - | V |
| Collector Emitter Saturation Voltage<br>at $-I_C$ = 2 A, $-I_B$ = 200 mA | $-V_{CE(sat)}$ | - | - | 0.8 | V |
| Transition Frequency<br>at $-V_{CE}$ = 5 V, $I_E$ = 0.5 A, f = 100 MHz | $f_T$ | - | 100 | - | MHz |
| Output Capacitance<br>at $-V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz | $C_{ob}$ | - | 50 | - | pF |

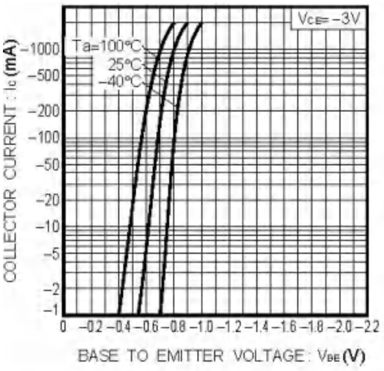


Fig.1 Grounded emitter propagation characteristics

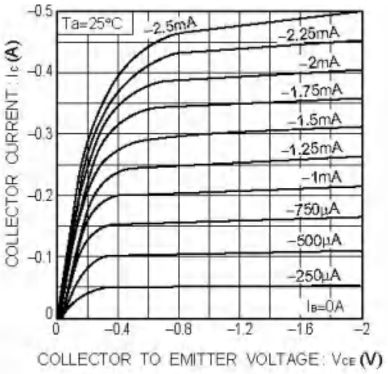


Fig.2 Grounded emitter output characteristics

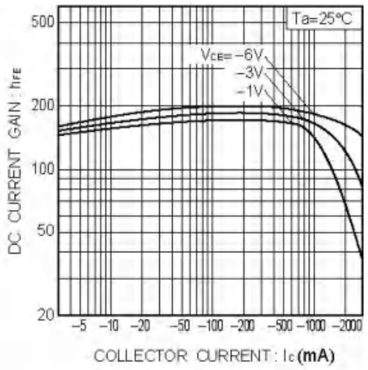


Fig.3 DC current gain vs. collector curren ( I )

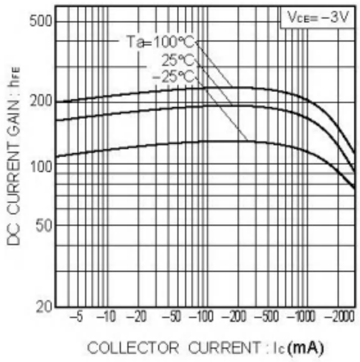


Fig.4 DC current gain vs. collector current (II)

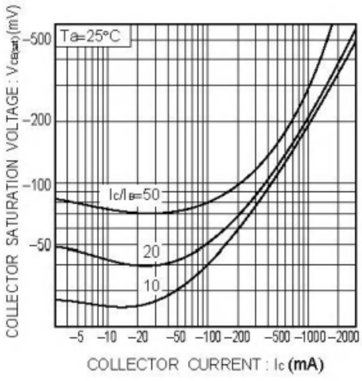


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

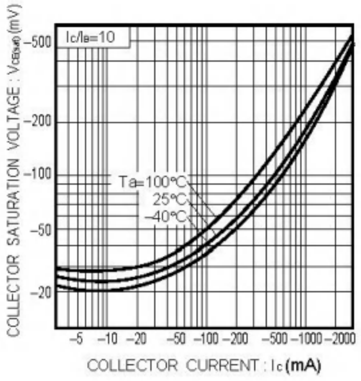


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

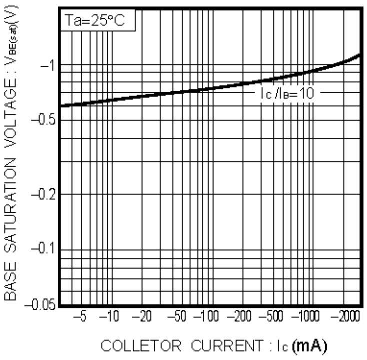


Fig.7 Base-emitter saturation voltage vs. collector current

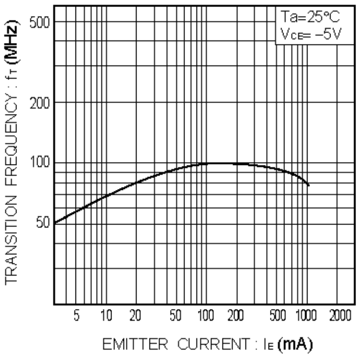


Fig.8 Gain bandwidth product vs. emitter current

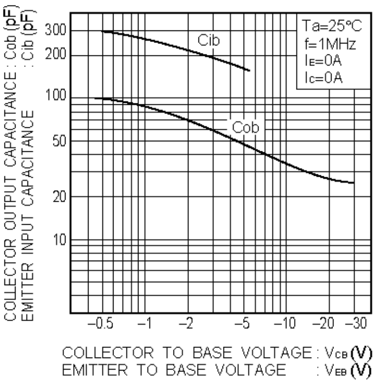
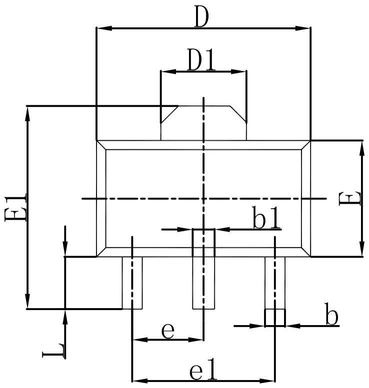
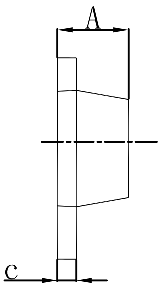
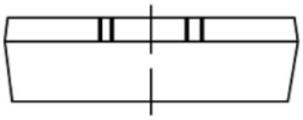


Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

## SOT-89-3L Outlines Dimensions







| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF. | | 0.061 REF. | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP. | | 0.060 TYP. | |
| e1 | 3.000 TYP. | | 0.118 TYP. | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |