

PNP PLASTIC ENCAPSULATE TRANSISTORS

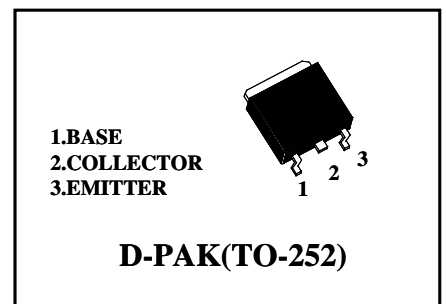
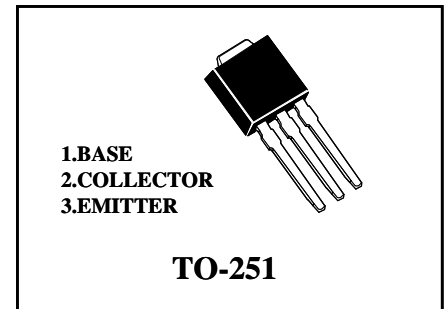
 **Lead(Pb)-Free**

Features:

* Low $V_{CE(sat)}$. $V_{CE(sat)} = -0.5V$ (Typ.) ($I_C/I_B = -2A / -0.2A$)

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

| Parameter | Symbol | Value | Unit |
|-------------------------------|-----------|-------------|-------------|
| Collector-Base Voltage | V_{CBO} | -60 | V |
| Collector-Emitter Voltage | V_{CEO} | -50 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Collector Current –Continuous | I_C | -3 | A |
| Collector Power Dissipation | P_C | 1 | W |
| Junction Temperature | T_j | +150 | $^{\circ}C$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | $^{\circ}C$ |


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

| Parameter | Symbol | Test Conditions | MIN | TYP | MAX | UNIT |
|--------------------------------------|---------------|----------------------------------|-----|-----|------|---------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C=-50\mu A, I_E=0$ | -60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C=-1mA, I_B=0$ | -50 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E=-50\mu A, I_C=0$ | -5 | | | V |
| Collector cut-off current | I_{CBO} | $V_{CB}=-40V, I_E=0$ | | | -1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB}=-4V, I_C=0$ | | | -1 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}=-3V, I_C=-0.5A$ | 82 | | 390 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=-2A, I_B=-0.2A$ | | | -1 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C=-1.5A, I_B=-0.15A$ | | | -1.2 | V |
| Transition frequency | f_T | $V_{CE}=-5V, I_C=-0.5A, f=30MHz$ | | 70 | | MHz |
| Collector output capacitance | C_{ob} | $V_{CB}=-10V, I_E=0, f=1MHz$ | | 50 | | pF |

CLASSIFICATION OF $h_{FE(1)}$

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

Typical Characteristics

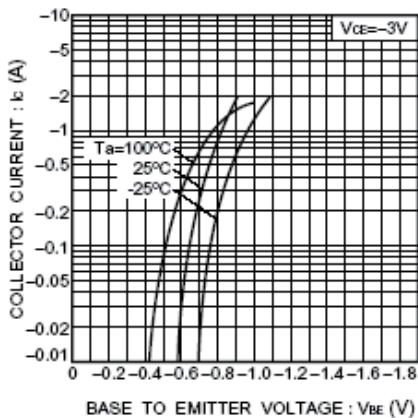


Fig.1 Grounded emitter propagation characteristics

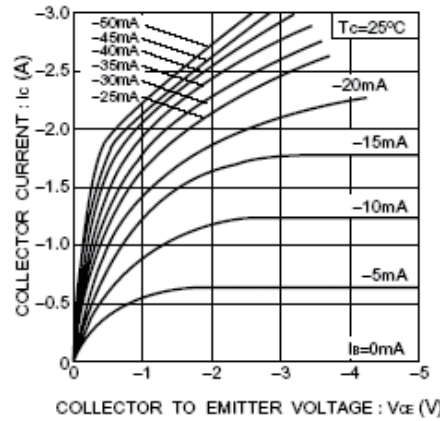


Fig.2 Grounded emitter output characteristics (I)

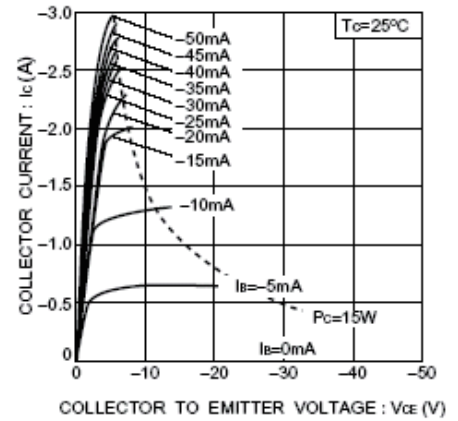


Fig.3 Grounded emitter output characteristics (II)

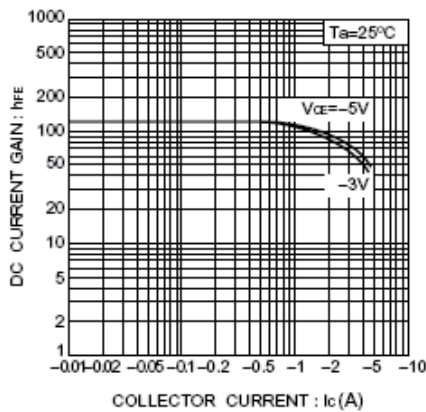


Fig.4 DC current gain vs. collector current (I)

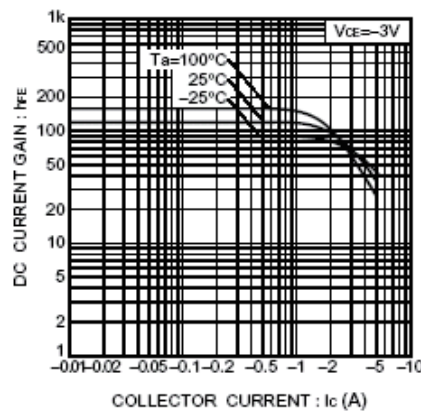


Fig.5 DC current gain vs. collector current (II)

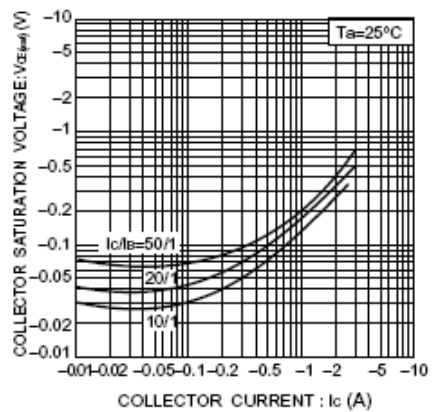


Fig.6 Collector-emitter saturation voltage vs. collector current

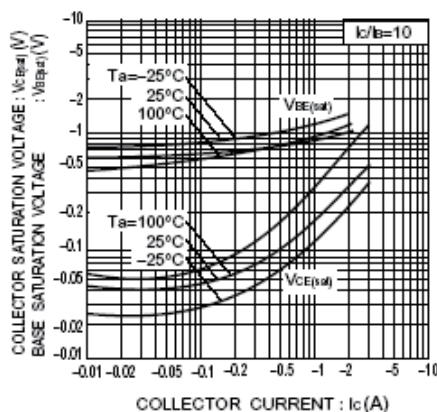


Fig.7 Collector-emitter saturation voltage vs. collector current
Base-emitter saturation voltage vs. collector current

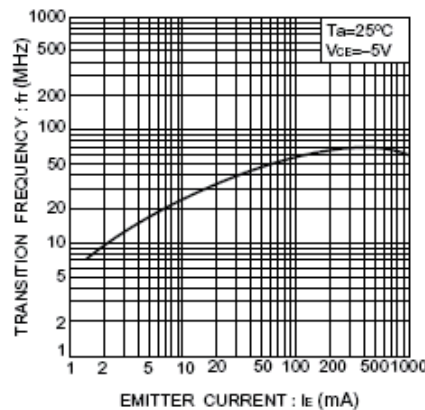


Fig.8 Gain bandwidth product vs. emitter current

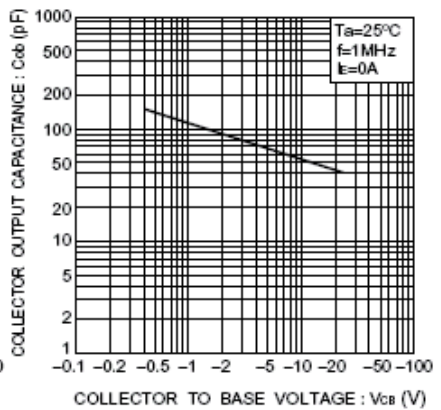


Fig.9 Collector output capacitance vs. collector base voltage

Typical Characteristics

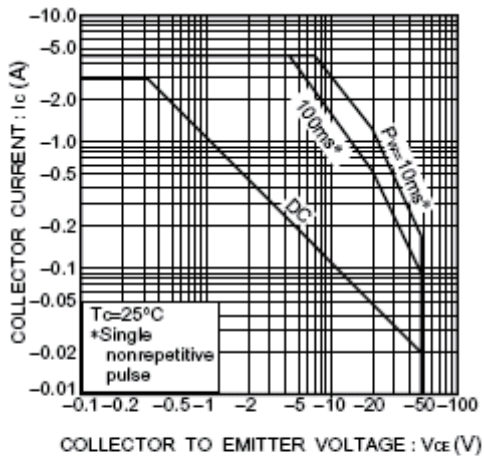
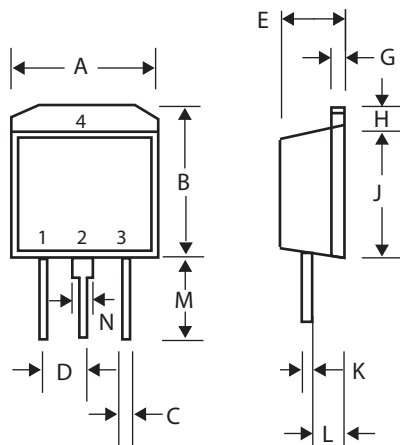


Fig.10 Safe operation area (2SB1184)

TO-251 Outline Dimensions

unit:mm

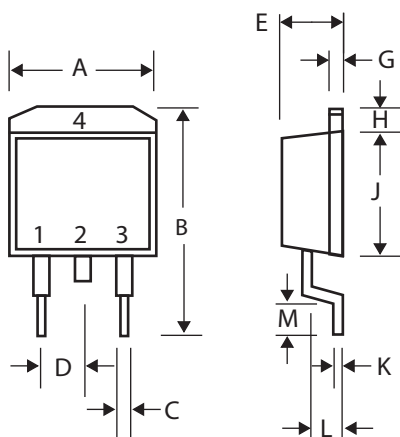


| TO-251 | | |
|--------|------|------|
| Dim | Min | Max |
| A | 6.40 | 6.80 |
| B | 6.80 | 7.20 |
| C | 0.50 | 0.80 |
| D | - | 2.30 |
| E | 2.20 | 2.50 |
| G | 0.45 | 0.55 |
| H | 1.00 | 1.60 |
| J | 5.40 | 5.80 |
| K | 0.45 | 0.69 |
| L | 0.90 | 1.50 |
| M | 6.50 | - |
| N | - | 0.90 |

1. Emitter
2. Base
3. Collector

TO-252 Outline Dimensions

unit:mm



| TO-252 | | |
|--------|------|-------|
| Dim | Min | Max |
| A | 6.40 | 6.80 |
| B | 9.00 | 10.00 |
| C | 0.50 | 0.80 |
| D | - | 2.30 |
| E | 2.20 | 2.50 |
| G | 0.45 | 0.55 |
| H | 1.00 | 1.60 |
| J | 5.40 | 5.80 |
| K | 0.30 | 0.64 |
| L | 0.70 | 1.70 |
| M | 0.90 | 1.50 |