# Medium power transistor (32V, 2A)

## 2SD1758 / 2SD1862

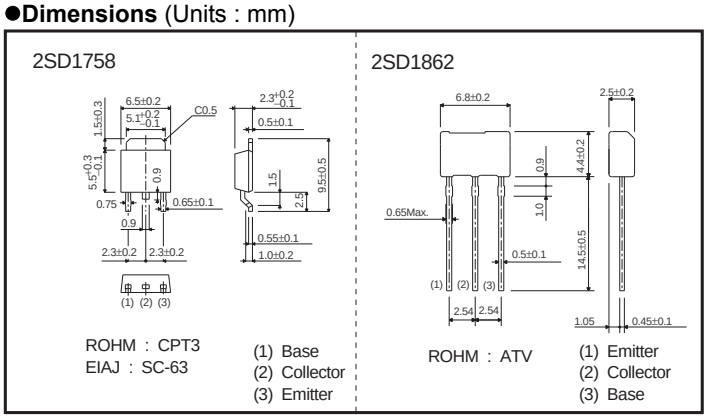
### ●Features

1) Low $V_{CE(sat)}$.
   $V_{CE(sat)}$ = 0.5V (Typ.)
   ($I_C/I_B$ = 2A / 0.2A)
2) Complements the 2SB1182 / 2SB1240

### ●Structure

Epitaxial planar type NPN silicon transistor

### ●Dimensions (Units : mm)




### ●Absolute maximum ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Collector-base voltage | | $V_{CBO}$ | 40 | V |
| Collector-emitter voltage | | $V_{CEO}$ | 32 | V |
| Emitter-base voltage | | $V_{EBO}$ | 5 | V |
| Collector current | | $I_C$ | 2 | A (DC) |
| | | | 2.5 | A (Pulse) ∗1 |
| Collector power dissipation | 2SD1758 | $P_C$ | 10 | W ($T_C$=25°C) |
| | 2SD1862 | | 1 | W ∗2 |
| Junction temperature | | Tj | 150 | °C |
| Storage temperature | | Tstg | −55 to +150 | °C |

∗1 Single pulse, $P_W$=20ms
∗2 Printed circuit board: 1.7 mm thick, collector copper plating 1 $cm^2$ or lager.

### ●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | 40 | – | – | V | $I_C$=50μA |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | 32 | – | – | V | $I_C$=1mA |
| Emitter-base breakdown voltage | $BV_{EBO}$ | 5 | – | – | V | $I_E$=50μA |
| Collector cutoff current | $I_{CBO}$ | – | – | 1 | μA | $V_{CB}$=20V |
| Emitter cutoff current | $I_{EBO}$ | – | – | 1 | μA | $V_{EB}$=4V |
| DC current transfer ratio | $h_{FE}$ | 120 | – | 390 | – | $V_{CE}$=3V, $I_C$=0.5A ∗ |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | – | 0.5 | 0.8 | V | $I_C/I_B$=2A/0.2A ∗ |
| Transition frequency | $f_T$ | – | 100 | – | MHz | $V_{CE}$=5V, $I_E$=−50mA, f=100MHz ∗ |
| Output capacitance | Cob | – | 30 | – | pF | $V_{CB}$=10V, $I_E$=0A, f=1MHz |

∗ Measured using pulse current.


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## ●Packaging specifications and $h_{FE}$

| Type | $h_{FE}$ | Package | Taping | |
|---|---|---|---|---|
| | | Code | TL | TV2 |
| | | Basic ordering unit (pieces) | 2500 | 2500 |
| 2SD1758 | QR | | ○ | – |
| 2SD1862 | QR | | – | ○ |

$h_{FE}$ values are classified as follows :

| Item | Q | R |
|---|---|---|
| $h_{FE}$ | 120 to 270 | 180 to 390 |

## ●Electrical characteristic curves

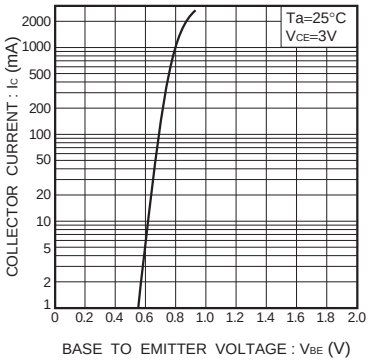



Fig.1 Grounded emitter propagation characteristics

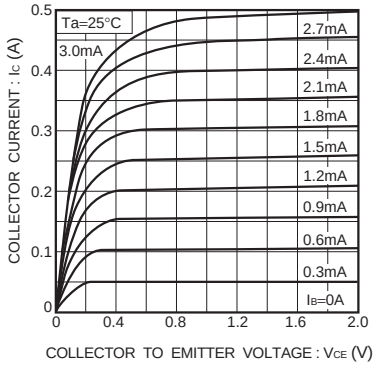



Fig.2 Grounded emitter output characteristics

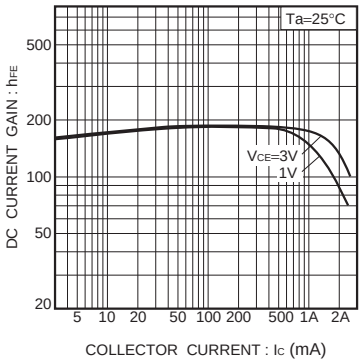



Fig.3 DC current gain vs. collector current

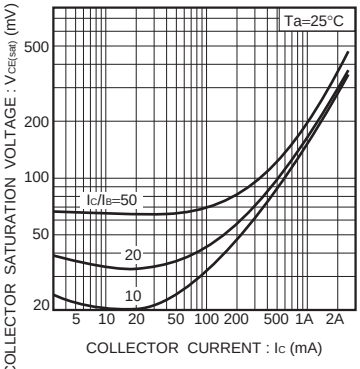



Fig.4 Collector-emitter saturation voltage vs. collector current

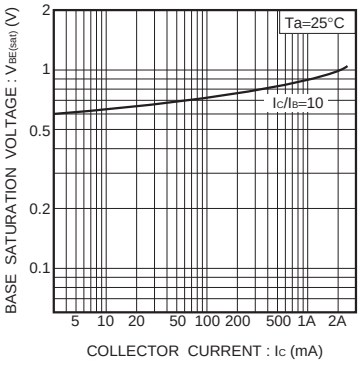



Fig.5 Collector-emitter saturation voltage vs. collector current

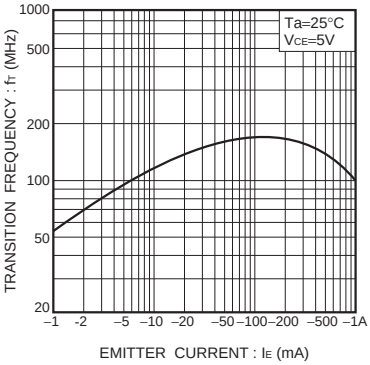



Fig.6 Transition frequency vs. emitter current

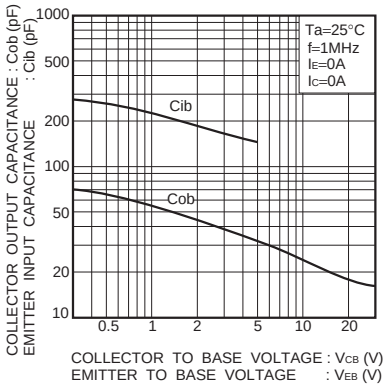



Fig.7 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

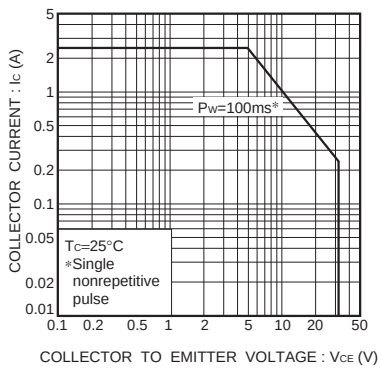



Fig.8 Safe operating area (2SD1758)

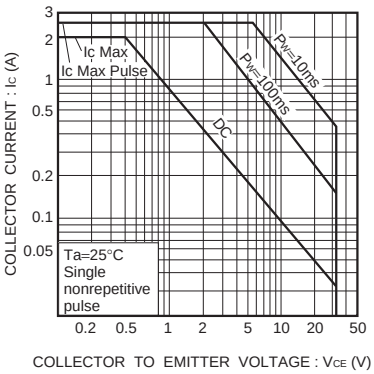



Fig.9 Safe operating area (2SD1862)


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