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Medium Power Transistor (32V, 1A)

2SD1664 / 2SD1858

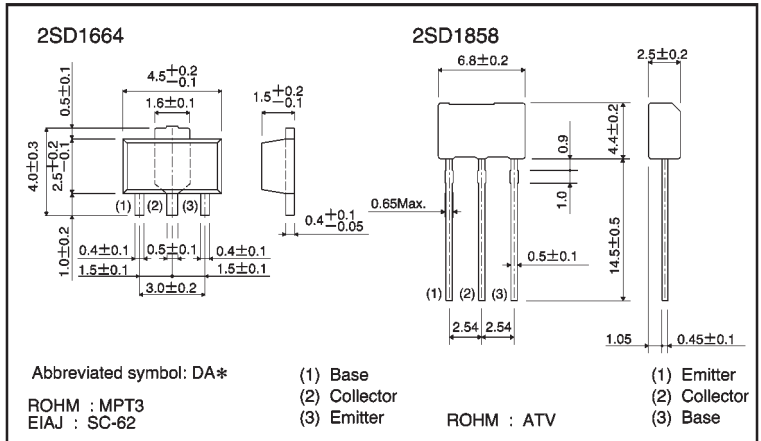
●Features

- 1) Low $V_{CE(sat)}$, $V_{CE(sat)} = 0.15V$ (typical).
($I_c/I_b = 500mA/50mA$)
- 2) Complements the
2SB1132 / 2SB1237.

●Structure

Epitaxial planar type
NPN silicon transistor

●External dimensions (Units: mm)



●Absolute maximum ratings ($T_a = 25^\circ C$)

| 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 | 1 | A (DC) |
| | | 2 | A (Pulse) *1 |
| Collector power dissipation | 2SD1664 | 0.5 | W *2 |
| | | 2 | |
| | 2SD1858 | 1 | *3 |
| Junction temperature | T_j | 150 | $^\circ C$ |
| Storage temperature | T_{stg} | -55~+150 | $^\circ C$ |

*1 $P_w=20ms$, $duty=1/2$

*2 When mounted on a 40×40×0.7 mm ceramic board.

*3 When it is mounted on the copper clad PCB (1.7mm thick) with land size for collector 1 square CM or larger.

●Electrical characteristics (Ta = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-base breakdown voltage | BV _{CBO} | 40 | — | — | V | I _c =50 μA |
| Collector-emitter breakdown voltage | BV _{CEO} | 32 | — | — | V | I _c =1mA |
| Emitter-base breakdown voltage | BV _{EBO} | 5 | — | — | V | I _E =50 μA |
| Collector cutoff current | I _{cBO} | — | — | 0.5 | μA | V _{CB} =20V |
| Emitter cutoff current | I _{EBO} | — | — | 0.5 | μA | V _{EB} =4V |
| DC current transfer ratio | h _{FE} | 82 | — | 390 | — | V _{CE} =3V, I _c =100mA |
| Collector-emitter saturation voltage | V _{CE(sat)} | — | 0.15 | 0.4 | V | I _c /I _B =500mA/50mA |
| Transition frequency | f _r | — | 150 | — | MHz | V _{CE} =5V, I _E =-50mA, f=100MHz |
| Output capacitance | C _{ob} | — | 15 | — | pF | V _{CB} =10V, I _E =0A, f=1MHz |

●Packaging specifications and h_{FE}

| Type | h _{FE} | Package | Taping | |
|---------|-----------------|------------------------------|--------|------|
| | | Code | T100 | TV2 |
| | | Basic ordering unit (pieces) | 1000 | 2500 |
| 2SD1664 | PQR | ○ | — | — |
| 2SD1858 | PQR | — | ○ | — |

h_{FE} values are classified as follows :

| Item | P | Q | R |
|-----------------|--------|---------|---------|
| h _{FE} | 82~180 | 120~270 | 180~390 |

●Electrical characteristic curves

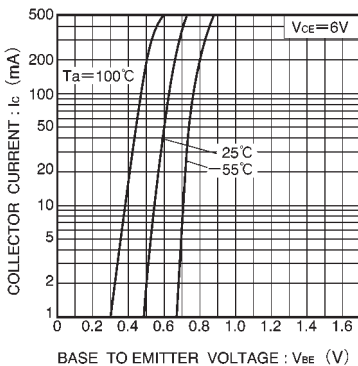


Fig.1 Grounded emitter propagation characteristics

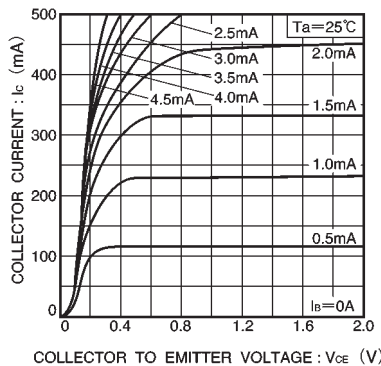


Fig.2 Grounded emitter output characteristics

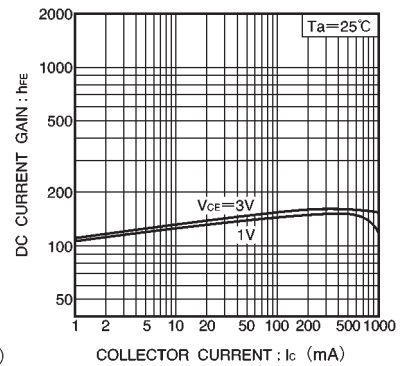


Fig.3 DC current gain vs. collector current (I)

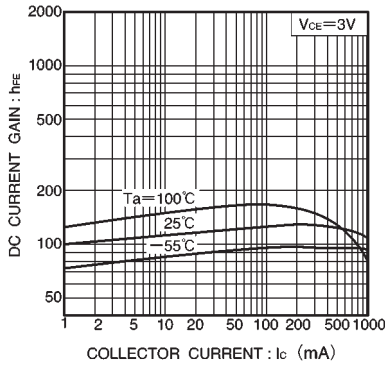


Fig.4 DC current gain vs. collector current (II)

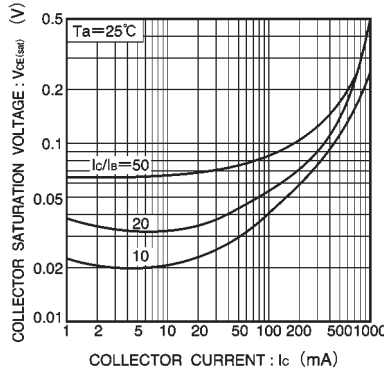


Fig.5 Collector-emitter saturation voltage vs. collector current (I)

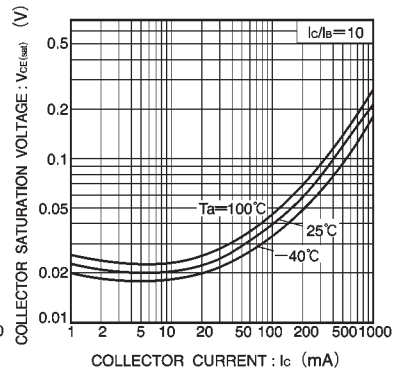


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

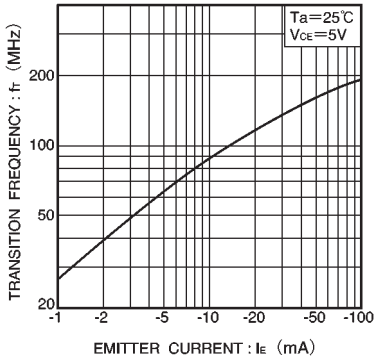


Fig.7 Gain bandwidth product vs. emitter current

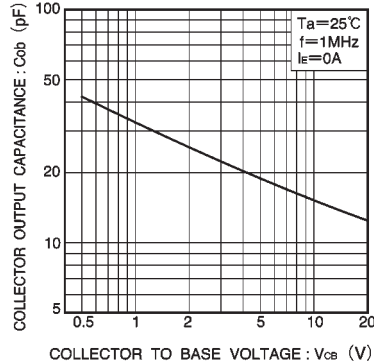


Fig.8 Collector output capacitance vs. collector-base voltage

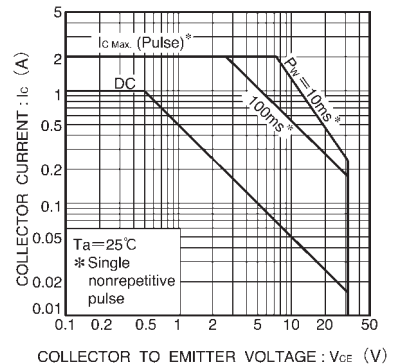


Fig.9 Safe operating area (2SD1664)

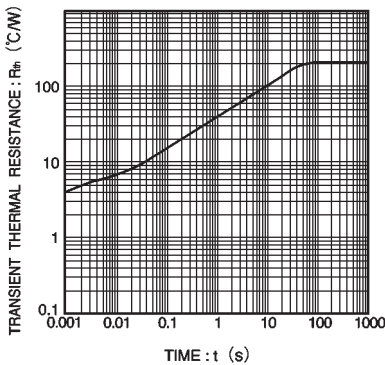


Fig.10 Transient thermal resistance (2SD1664)

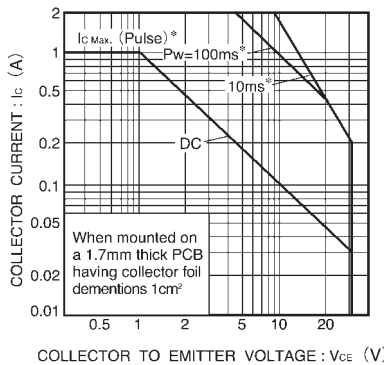


Fig.11 Safe operating area (2SD1858)

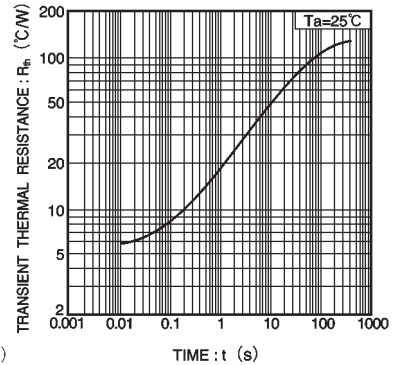


Fig.12 Transient thermal resistance (2SD1858)