

# Medium Power Transistor (32V, 1A)

2SD1664 / 2SD1858

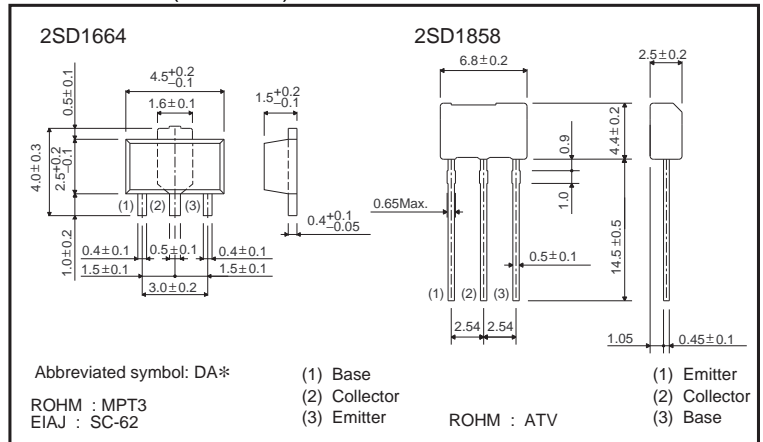
●Features

- 1) Low  $V_{CE(sat)} = 0.15V(Typ.)$   
( $I_C / I_B = 500mA / 50mA$ )
- 2) Compliments 2SB1132 / 2SB1237

●Structure

Epitaxial planar type  
NPN silicon transistor

●Dimensions (Unit : mm)



\* Denotes hFE

●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           | $I_C$              | 1           | A (DC)       |      |
|                             |                    | 2           | A (Pulse) *1 |      |
| Collector power dissipation | 2SD1664<br>2SD1858 | $P_C$       | 0.5          | W *2 |
|                             |                    |             | 2            |      |
|                             |                    |             | 1            | *3   |
| Junction temperature        | $T_j$              | 150         | °C           |      |
| Storage temperature         | $T_{stg}$          | -55 to +150 | °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       | $I_C=50\mu A$                     |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 32   | —    | —    | V       | $I_C=1mA$                         |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 5    | —    | —    | V       | $I_E=50\mu A$                     |
| Collector cutoff current             | $I_{CBO}$     | —    | —    | 0.5  | $\mu A$ | $V_{CB}=20V$                      |
| Emitter cutoff current               | $I_{EBO}$     | —    | —    | 0.5  | $\mu A$ | $V_{EB}=4V$                       |
| DC current transfer ratio            | $h_{FE}$      | 120  | —    | 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                 | $f_T$         | —    | 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 hFE

| Type    | hFE | Package                      | Taping |      |
|---------|-----|------------------------------|--------|------|
|         |     | Code                         | T100   | TV2  |
|         |     | Basic ordering unit (pieces) | 1000   | 2500 |
| 2SD1664 | QR  |                              | ○      | —    |
| 2SD1858 | QR  |                              | —      | ○    |

hFE values are classified as follows :

| Item | Q          | R          |
|------|------------|------------|
| hFE  | 120 to 270 | 180 to 390 |

●Electrical characteristics curves

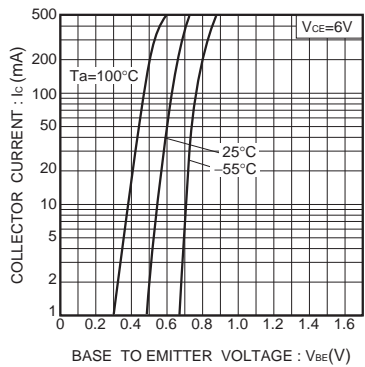


Fig.1 Grounded emitter propagation characteristics

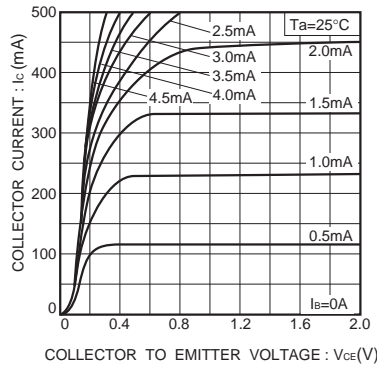


Fig.2 Grounded emitter output characteristics

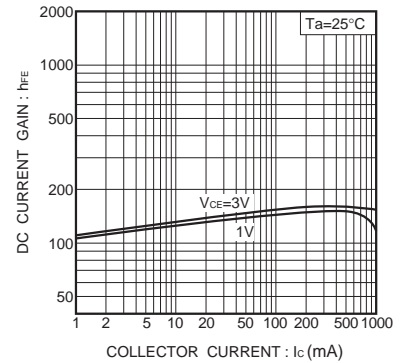


Fig.3 DC current gain vs. collector current ( I )

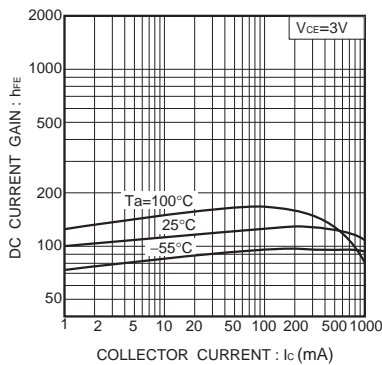


Fig.4 DC current gain vs. collector current (II)

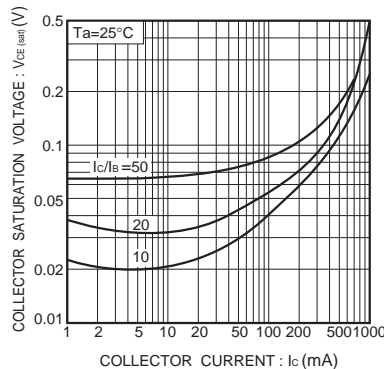


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

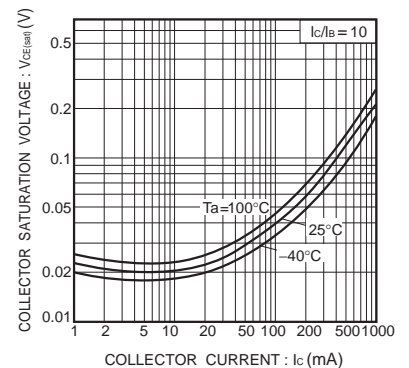


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

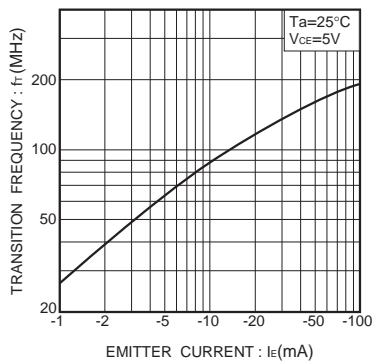


Fig.7 Gain bandwidth product vs. emitter current

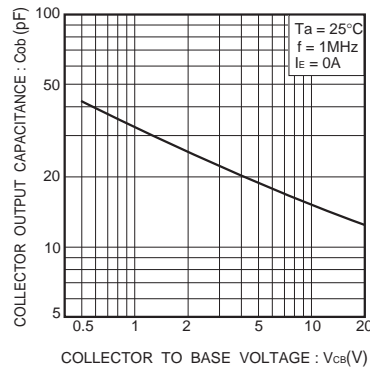


Fig.8 Collector output capacitance vs. collector-base voltage

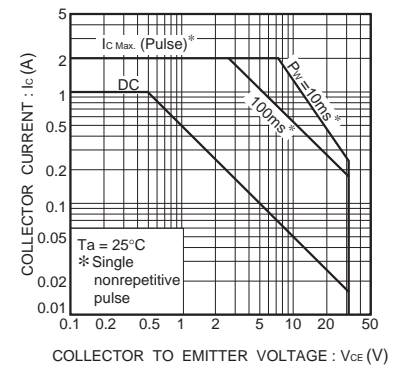


Fig.9 Safe operating area (2SD1664)

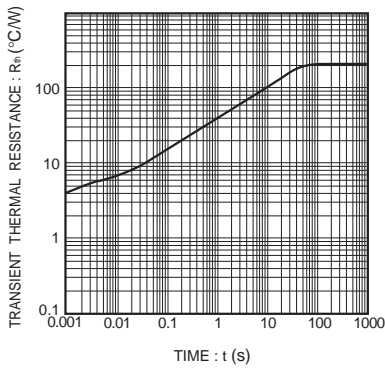


Fig.10 Transient thermal resistance (2SD1664)

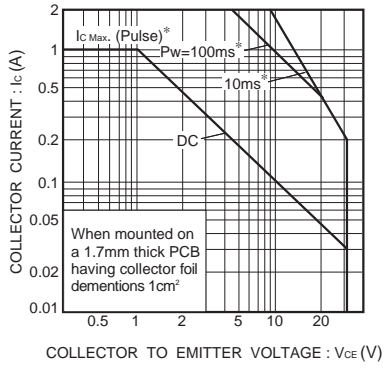


Fig.11 Safe operating area (2SD1858)

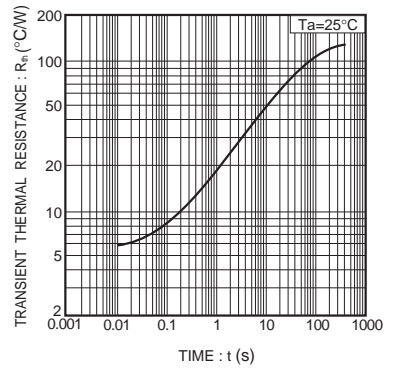


Fig.12 Transient thermal resistance (2SD1858)

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