

# High-voltage Switching Transistor (-400V, -2A)

## 2SA1862

### ●Features

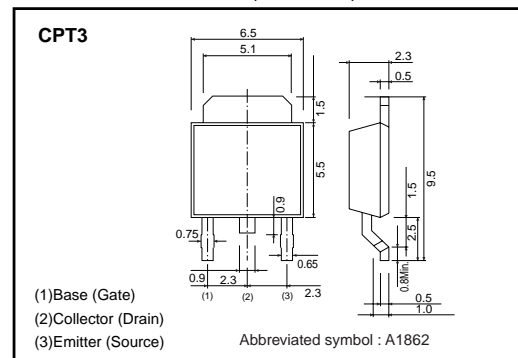
- 1) High breakdown voltage. ( $BV_{CEO} = -400V$ )
- 2) Low saturation voltage.  
(Max.  $V_{CE(sat)} = -0.5V$  at  $I_C / I_B = -500mA / -100mA$ )
- 3) High switching speed, typically  $t_f = 0.4\mu s$  at  $I_C = -1A$ .
- 4) Wide SOA (safe operating area).

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

| Parameter                   | Symbol    | Limits      | Unit                   |
|-----------------------------|-----------|-------------|------------------------|
| Collector-base voltage      | $V_{CB0}$ | -400        | V                      |
| Collector-emitter voltage   | $V_{CE0}$ | -400        | V                      |
| Emitter-base voltage        | $V_{EB0}$ | -7          | V                      |
| Collector current           | $I_C$     | -2          | A (DC)                 |
|                             |           | -4          | A (Pulse) *            |
| Collector power dissipation | $P_C$     | 1           | W                      |
|                             |           | 10          | W ( $T_C=25^\circ C$ ) |
| Junction temperature        | $T_J$     | 150         | $^\circ C$             |
| Storage temperature         | $T_{stg}$ | -55 to +150 | $^\circ C$             |

\* Single pulse,  $P_w=10ms$

### ●External dimensions (Unit : mm)



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

|                              |         |
|------------------------------|---------|
| Type                         | 2SA1862 |
| Package                      | CPT3    |
| $h_{FE}$                     | P       |
| Code                         | TL      |
| Basic ordering unit (pieces) | 2500    |

### ●Electrical characteristics ( $T_a=25^\circ C$ )

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit    | Conditions                            |
|--------------------------------------|---------------|------|------|------|---------|---------------------------------------|
| Collector-base breakdown voltage     | $BV_{CB0}$    | -400 | -    | -    | V       | $I_C = -50\mu A$                      |
| Collector-emitter breakdown voltage  | $BV_{CE0}$    | -400 | -    | -    | V       | $I_C = -1mA$                          |
| Emitter-base breakdown voltage       | $BV_{EB0}$    | -7   | -    | -    | V       | $I_E = -50\mu A$                      |
| Collector cutoff current             | $I_{CB0}$     | -    | -    | -10  | $\mu A$ | $V_{CB} = -400V$                      |
| Emitter cutoff current               | $I_{EB0}$     | -    | -    | -10  | $\mu A$ | $V_{EB} = -5V$                        |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | -    | -    | -0.5 | V       | $I_C/I_B = -0.5A / -0.1A$             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | -    | -    | -1.2 | V       | $I_C/I_B = -0.5A / -0.1A$             |
| DC current transfer ratio            | $h_{FE}$      | 82   | -    | 180  | -       | $V_{CE} = -5V, I_C = -0.1A$           |
| Transition frequency                 | $f_T$         | -    | 18   | -    | MHz     | $V_{CB} = -10V, I_E = 0.1A, f = 5MHz$ |
| Output capacitance                   | $C_{ob}$      | -    | 30   | -    | pF      | $V_{CE} = -10V, I_E = 0A, f = 1MHz$   |
| Turn-on time                         | $t_{on}$      | -    | 0.2  | -    | $\mu s$ | $I_C = -1A, R_L = 150\Omega$          |
| Storage time                         | $t_{stg}$     | -    | 1.8  | -    | $\mu s$ | $I_{B1} = -I_{B2} = -0.2A$            |
| Fall time                            | $t_f$         | -    | 0.4  | -    | $\mu s$ | $V_{CC} = -150V$                      |

Transistors

●Electrical characteristic curves

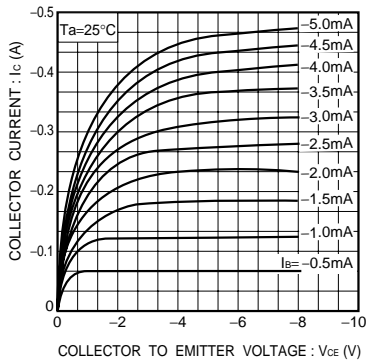


Fig.1 Ground emitter output characteristics

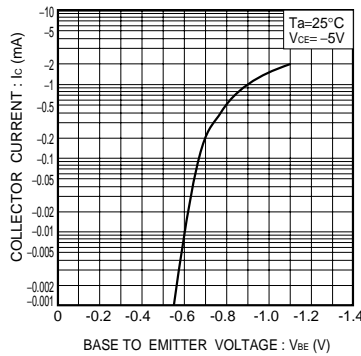


Fig.2 Grounded emitter propagation characteristics

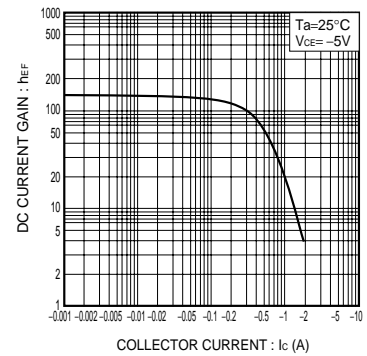


Fig.3 DC current gain vs. collector current

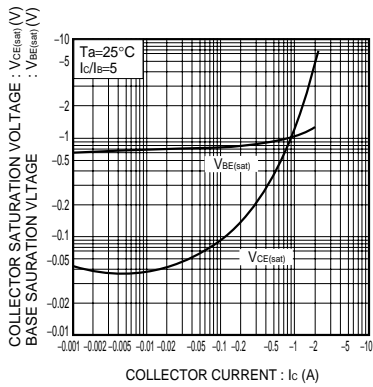


Fig.4 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage vs. collector current

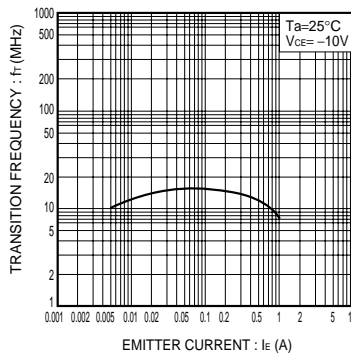


Fig.5 Gain bandwidth product vs. emitter current

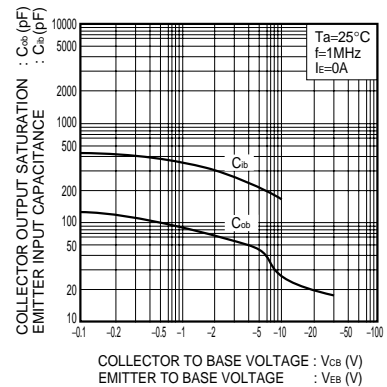


Fig.6 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

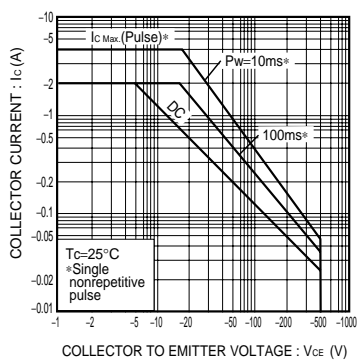


Fig.7 Safe operating area

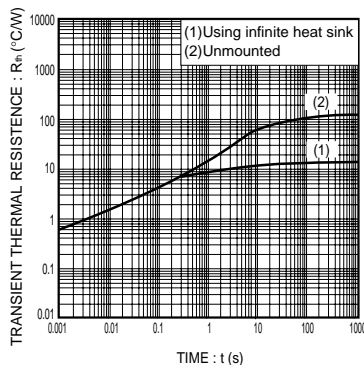


Fig.8 Transient thermal resistance

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