

# Power transistor (−30V, −2A)

## 2SA2087

### ●Features

- 1) High speed switching. (Tf : Typ. : 20ns at  $I_c = -2A$ )
- 2) Low saturation voltage, typically  
(Typ. : −200mV at  $I_c = -1.0A, I_B = -100mA$ )
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Complements the 2SC5875

### ●Applications

Low frequency amplifier  
High speed switching

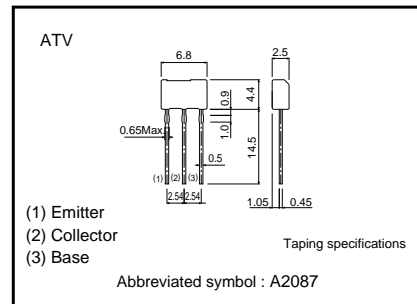
### ●Structure

PNP Silicon epitaxial planar transistor

### ●Packaging specifications

| Type    | Package                      | Taping |
|---------|------------------------------|--------|
|         | Code                         | TV2    |
|         | Basic ordering unit (pieces) | 2500   |
| 2SA2087 |                              | ○      |

### ●External dimensions (Unit : mm)



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

| Parameter                    | Symbol    | Limits     | Unit |      |
|------------------------------|-----------|------------|------|------|
| Collector-base voltage       | $V_{CBO}$ | −30        | V    |      |
| Collector-emitter voltage    | $V_{CEO}$ | −30        | V    |      |
| Emitter-base voltage         | $V_{EBO}$ | −6         | V    |      |
| Collector current            | DC        | $I_c$      | −2   | A    |
|                              | Pulsed    | $I_{CP}$   | −4   | A *1 |
| Power dissipation            | $P_c$     | 1.0        | W *2 |      |
| Junction temperature         | $T_j$     | 150        | °C   |      |
| Range of storage temperature | $T_{stg}$ | −55 to 150 | °C   |      |

\*1  $P_w=10ms$

\*2 Each terminal mounted on a recommended land

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●Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit          | Condition   |
|--------------------------------------|---------------|------|------|------|---------------|---|
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | -30  | -    | -    | V             | $I_C = -1\text{mA}$   |
| Collector-base breakdown voltage     | $BV_{CBO}$    | -30  | -    | -    | V             | $I_C = -100\mu\text{A}$   |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | -6   | -    | -    | V             | $I_E = -100\mu\text{A}$   |
| Collector cut-off current            | $I_{CBO}$     | -    | -    | -1.0 | $\mu\text{A}$ | $V_{CB} = -20\text{V}$  |
| Emitter cut-off current              | $I_{EBO}$     | -    | -    | -1.0 | $\mu\text{A}$ | $V_{EB} = -4\text{V}$   |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | -    | -200 | -500 | mV            | $I_C = -1.0\text{A}$<br>$I_B = -100\text{mA}$                             |
| DC current gain                      | $h_{FE}$      | 120  | -    | 390  | -             | $V_{CE} = -2\text{V}$<br>$I_C = -100\text{mA}$                            |
| Transition frequency                 | $f_T$         | -    | 350  | -    | MHz           | $V_{CE} = -10\text{V}$<br>$I_E = 100\text{mA}$<br>$f = 10\text{MHz}$      |
| Corrector output capacitance         | $C_{ob}$      | -    | 25   | -    | pF            | $V_{CB} = -10\text{V}$<br>$I_E = 0\text{mA}$<br>$f = 1\text{MHz}$         |
| Turn-on time                         | $T_{on}$      | -    | 25   | -    | ns            | $I_C = -2\text{A}$<br>$I_{B1} = -200\text{mA}$<br>$I_{B2} = 200\text{mA}$ |
| Storage time                         | $T_{stg}$     | -    | 100  | -    | ns            | $V_{CC} = -25\text{V}$  |
| Fall time                            | $T_f$         | -    | 20   | -    | ns            |   |

\*Non repetitive pulse

● $h_{FE}$  RANK

| Q       | R       |
|---------|---------|
| 120-270 | 180-390 |

●Electrical characteristic curves

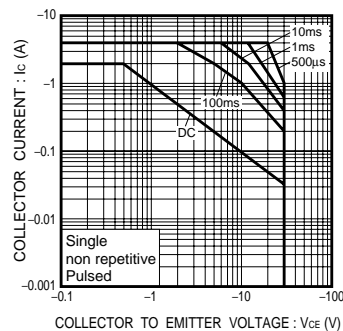


Fig.1 Safe Operating Area

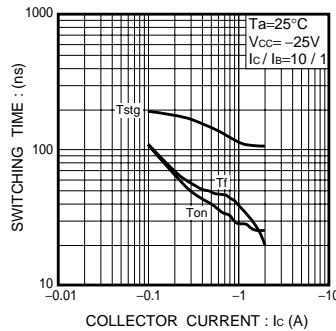


Fig.2 Switching Time

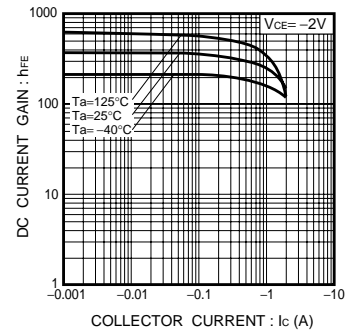


Fig.3 DC Current Gain vs. Collector Current (I)

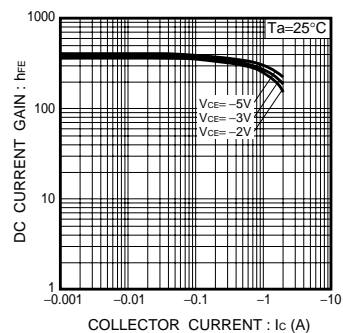


Fig.4 DC Current Gain vs. Collector Current (II)

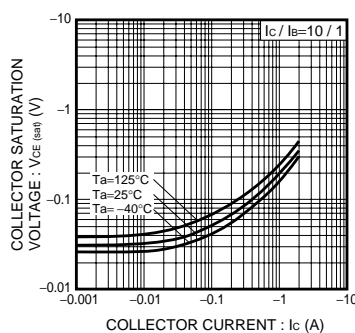


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (I)

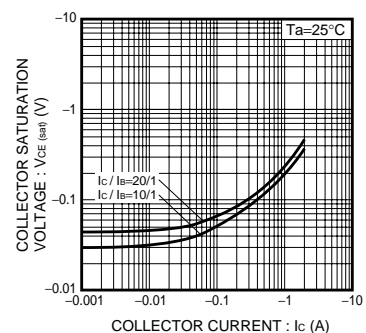


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

Transistors

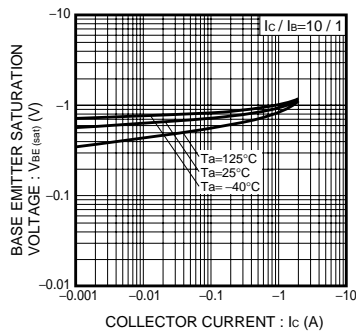


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

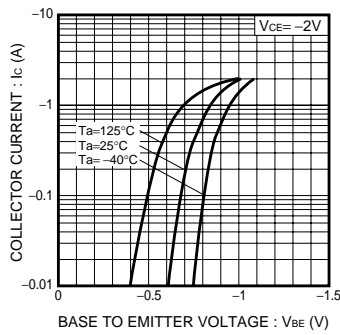


Fig.8 Grounded Emitter Propagation Characteristics

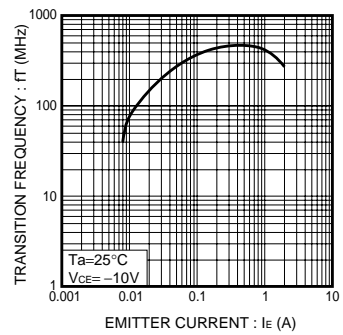


Fig.9 Transition Frequency

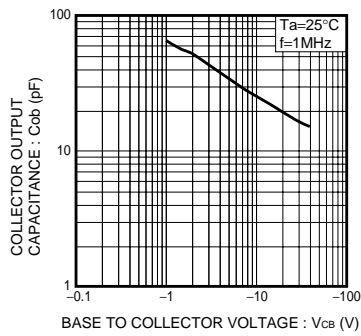
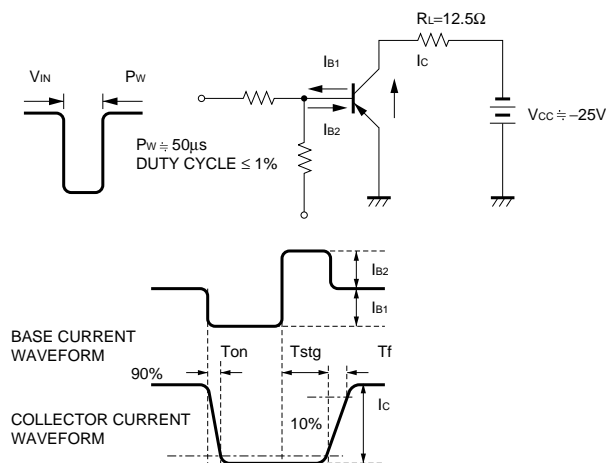


Fig.10 Collector Output Capacitance

●Switching characteristics measurement circuits



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