

# High voltage discharge, High speed switching, Low Noise (–60V, –3A)

## 2SA2072

### ●Features

- 1) High speed switching. (  $t_f$  : Typ. : 20ns at  $I_c = -3A$  )
- 2) Low saturation voltage, typically.  
(Typ. : –200mV at  $I_c = -2.0A$ ,  $I_B = -200mA$  )
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Low Noise.

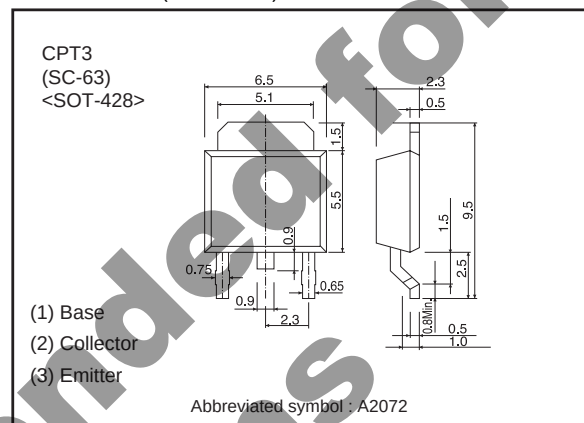
### ●Applications

High speed switching, Low noise

### ●Structure

PNP silicon epitaxial planar transistor

### ●Dimensions (Unit : mm)



### ●Packaging specifications

| Type    | Package                      | Taping |
|---------|------------------------------|--------|
|         | Code                         | TL     |
|         | Basic ordering unit (pieces) | 2500   |
| 2SA2072 |                              | ○      |

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

| Parameter                    | Symbol    | Limits      | Unit |
|------------------------------|-----------|-------------|------|
| Collector-base voltage       | $V_{CBO}$ | –60         | V    |
| Collector-emitter voltage    | $V_{CEO}$ | –60         | V    |
| Emitter-base voltage         | $V_{EBO}$ | –6          | V    |
| Collector current            | DC        | $I_C$       | –3   |
|                              | Pulsed    | $I_{CP}$ *1 | –6   |
| Power dissipation            | $P_C$     | 1.0         | W    |
|                              |           | 10.0        | W    |
| Junction temperature         | $t_j$     | 150         | °C   |
| Range of storage temperature | $t_{stg}$ | –55 to 150  | °C   |

\*1  $P_W = 100ms$

\*2  $T_a = 25^\circ C$

\*3  $T_c = 25^\circ C$

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

| Parameter                            | Symbol                      | Min. | Typ. | Max. | Unit          | Condition                                                                                           |
|--------------------------------------|-----------------------------|------|------|------|---------------|-----------------------------------------------------------------------------------------------------|
| Collector-emitter breakdown voltage  | $BV_{CEO}$                  | -60  | -    | -    | V             | $I_C = -1\text{mA}$                                                                                 |
| Collector-base breakdown voltage     | $BV_{CBO}$                  | -60  | -    | -    | 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 | $V_{CE(sat)}$ <sup>*1</sup> | -    | -200 | -500 | mV            | $I_C = -2\text{A}$<br>$I_B = -0.2\text{A}$                                                          |
| DC current gain                      | $h_{FE}$                    | 120  | -    | 270  | -             | $V_{CE} = -2\text{V}$<br>$I_C = -100\text{mA}$                                                      |
| Transistor frequency                 | $f_T$ <sup>*1</sup>         | -    | 180  | -    | MHz           | $V_{CE} = -10\text{V}$<br>$I_E = 100\text{mA}$<br>$f = 10\text{MHz}$                                |
| Collector output capacitance         | $C_{ob}$                    | -    | 50   | -    | pF            | $V_{CB} = -10\text{V}$<br>$I_E = 0\text{mA}$<br>$f = 1\text{MHz}$                                   |
| Turn-on time                         | $t_{on}$ <sup>*2</sup>      | -    | 20   | -    | ns            | $I_C = -3\text{A}$<br>$I_{B1} = -300\text{mA}$<br>$I_{B2} = 300\text{mA}$<br>$V_{CC} = -25\text{V}$ |
| Storage time                         | $t_{stg}$ <sup>*2</sup>     | -    | 150  | -    | ns            |                                                                                                     |
| Fall time                            | $t_f$ <sup>*2</sup>         | -    | 20   | -    | ns            |                                                                                                     |

\*1 Non repetitive pulse

\*2 See switching characteristics measurement circuits

## ●hFE RANK

| Q       |
|---------|
| 120-270 |

## ●Electrical characteristics curves

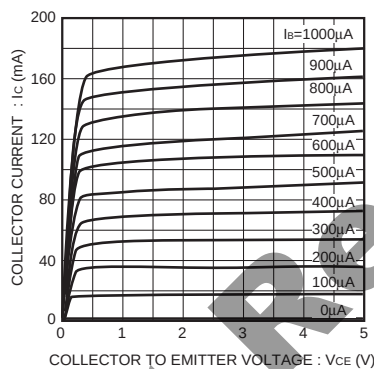


Fig.1 Typical output characteristics

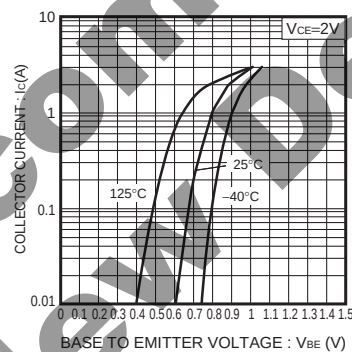


Fig.2 Grounded emitter propagation characteristics

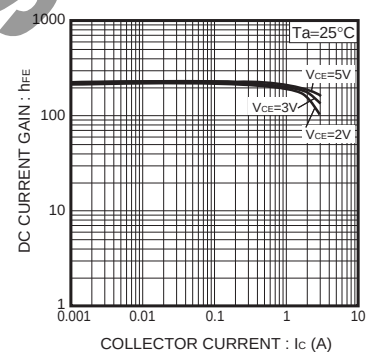


Fig.3 DC current gain vs. collector current (I)

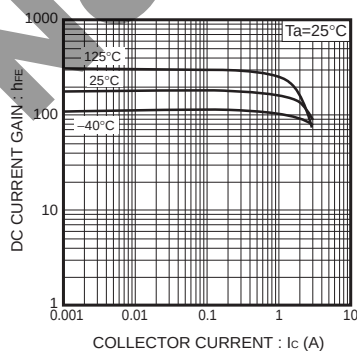


Fig.4 DC current gain vs. collector current (II)

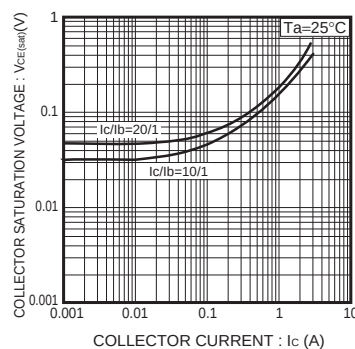


Fig.5 Collector-emitter saturation voltage vs. collector current (I)

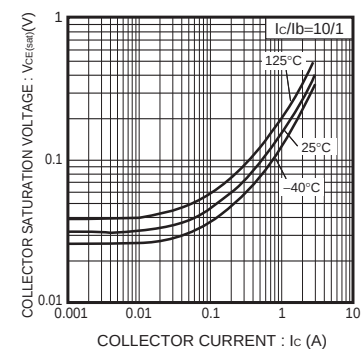


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

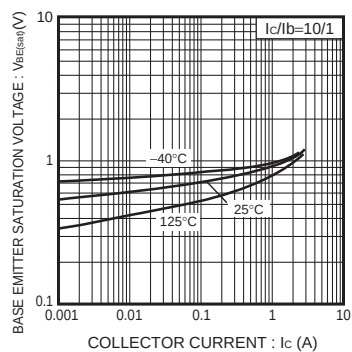


Fig.7 Base-emitter saturation voltage vs. collector current

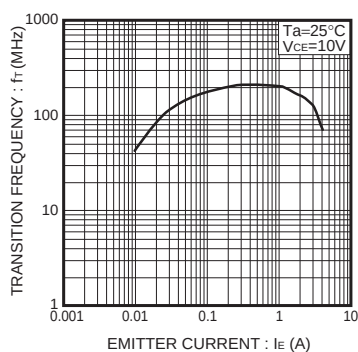


Fig.8 Transition frequency

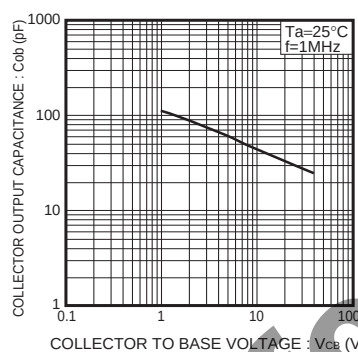


Fig.9 Collector output capacitance

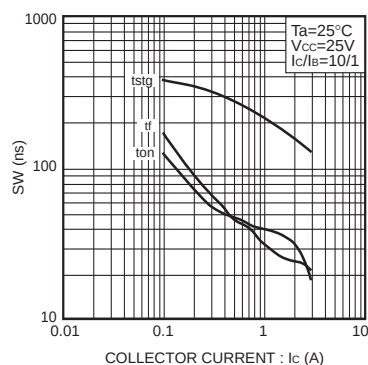
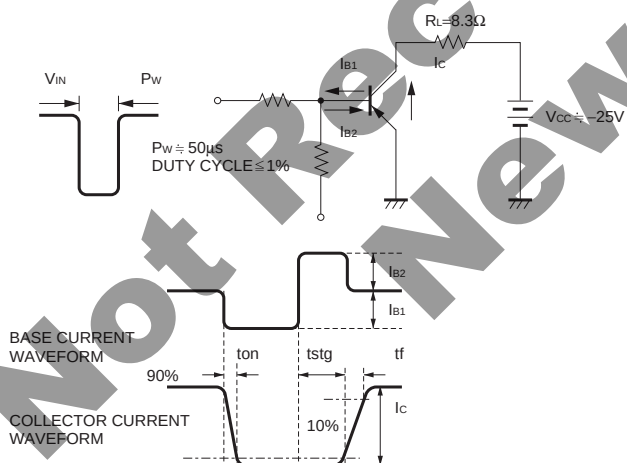


Fig.10 Switching Time

#### ●Switching characteristics measurement circuits



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| JAPAN     | USA       | EU         | CHINA     |
|-----------|-----------|------------|-----------|
| CLASS III | CLASS III | CLASS II b | CLASS III |
| CLASS IV  |           | CLASS III  |           |

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  - Use of the Products in places subject to dew condensation
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- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
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- Confirm that operation temperature is within the specified range described in the product specification.
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This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of ionizer, friction prevention and temperature / humidity control).

## Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
  - [a] the Products are exposed to sea winds or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

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