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# 2SA673A(K)

Silicon PNP Epitaxial

# HITACHI

ADE-208-313A (Z)  
2nd. Edition  
Mar. 2001

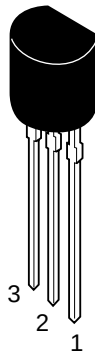
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## Application

- Low frequency amplifier
- Medium speed switching

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

2SA673A(K)

Absolute Maximum Ratings (Ta = 25°C)

| Item                         | Symbol           | Ratings     | Unit |
|------------------------------|------------------|-------------|------|
| Collector to base voltage    | V <sub>CBO</sub> | −50         | V    |
| Collector to emitter voltage | V <sub>CEO</sub> | −50         | V    |
| Emitter to base voltage      | V <sub>EBO</sub> | −4          | V    |
| Collector current            | I <sub>C</sub>   | −0.5        | A    |
| Collector power dissipation  | P <sub>C</sub>   | 0.4         | W    |
| Junction temperature         | T <sub>j</sub>   | 150         | °C   |
| Storage temperature          | T <sub>stg</sub> | −55 to +150 | °C   |

**Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

| Item                                    | Symbol        | Min | Typ   | Max  | Unit          | Test conditions                                                               |
|-----------------------------------------|---------------|-----|-------|------|---------------|-------------------------------------------------------------------------------|
| Collector to base breakdown voltage     | $V_{(BR)CBO}$ | -50 | —     | —    | V             | $I_C = -10\ \mu\text{A}$ , $I_E = 0$                                          |
| Collector to emitter breakdown voltage  | $V_{(BR)CEO}$ | -50 | —     | —    | V             | $I_C = -1\ \text{mA}$ , $R_{BE} = \infty$                                     |
| Emitter to base breakdown voltage       | $V_{(BR)EBO}$ | -4  | —     | —    | V             | $I_E = -10\ \mu\text{A}$ , $I_C = 0$                                          |
| Collector cutoff current                | $I_{CBO}$     | —   | —     | -0.5 | $\mu\text{A}$ | $V_{CE} = -20\ \text{V}$ , $I_E = 0$                                          |
| Emitter cutoff current                  | $I_{EBO}$     | —   | —     | -0.5 | $\mu\text{A}$ | $V_{EB} = -3\ \text{V}$ , $I_C = 0$                                           |
| Base to emitter voltage                 | $V_{BE}$      | —   | -0.64 | —    | V             | $V_{CE} = -3\ \text{V}$ , $I_C = -10\ \text{mA}$                              |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | —   | -0.2  | -0.6 | V             | $I_C = -150\ \text{mA}$ , $I_B = -15\ \text{mA}^{*2}$                         |
| Base to emitter saturation voltage      | $V_{BE(sat)}$ | —   | -0.87 | —    | V             | $I_C = -150\ \text{mA}$ , $I_B = -15\ \text{mA}^{*2}$                         |
| DC current transfer ratio               | $h_{FE}^{*1}$ | 60  | —     | 320  |               | $V_{CE} = -3\ \text{V}$ , $I_C = -10\ \text{mA}$                              |
|                                         | $h_{FE}$      | 10  | —     | —    |               | $V_{CE} = -3\ \text{V}$ , $I_C = -500\ \text{mA}^{*2}$                        |
| Gain bandwidth product                  | $f_T$         | —   | 120   | —    | MHz           | $V_{CE} = -3\ \text{V}$ , $I_C = -10\ \text{mA}$                              |
| Turn on time                            | $t_{on}$      | —   | 0.3   | —    | $\mu\text{s}$ | $V_{CC} = -10.3\ \text{V}$                                                    |
| Turn off time                           | $t_{off}$     | —   | 0.6   | —    | $\mu\text{s}$ | $I_C = 10\ \text{mA}$ , $I_{B1} = -10\ \text{mA}$ , $I_{B2} = -10\ \text{mA}$ |
| Storage time                            | $t_{stg}$     | —   | 0.4   | —    | $\mu\text{s}$ | $V_{CC} = -5\ \text{V}$ ,<br>$I_C = I_{B1} = I_{B2} = -20\ \text{mA}$         |

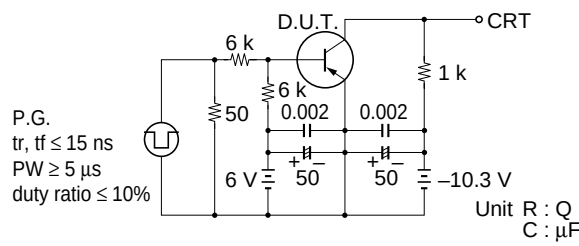
Notes: 1. The 2SA673A(K) is grouped by  $h_{FE}$  as follows.

2. Pulse test

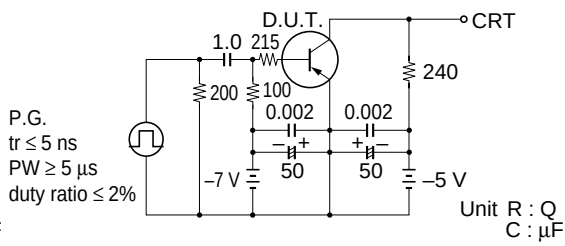
| B         | C          | D          |
|-----------|------------|------------|
| 60 to 120 | 100 to 200 | 160 to 320 |

See 2SA673A except for the above – mentioned characteristic curves.

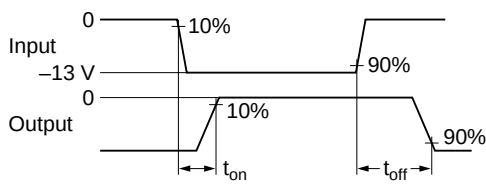
Switching Time Test Circuit  
 $t_{on}$ ,  $t_{off}$  Test Circuit



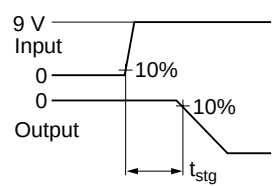
Switching Time Test Circuit  
 $t_{stg}$  Test Circuit

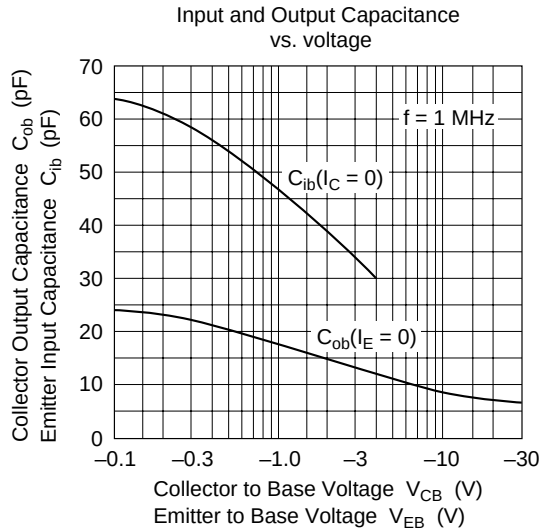
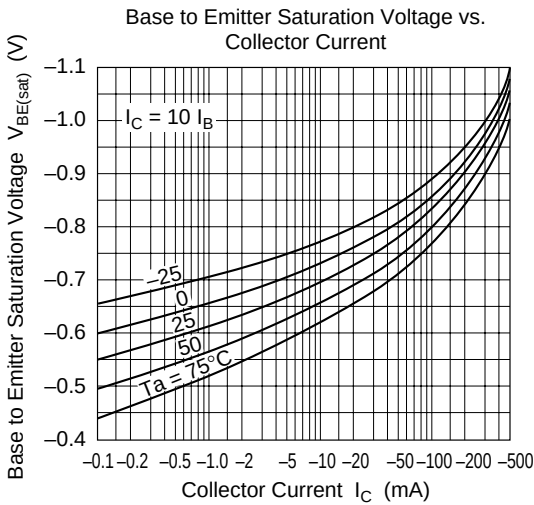
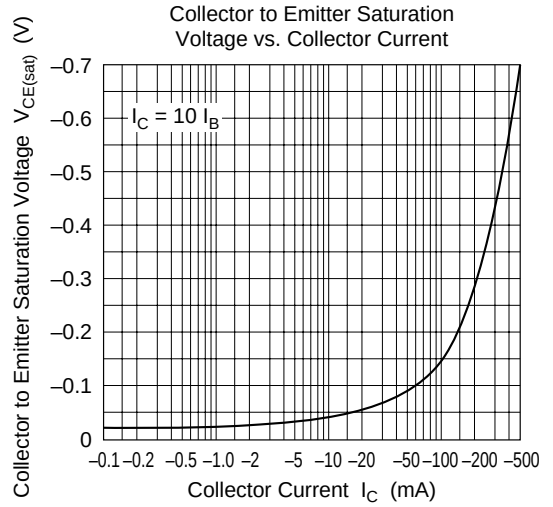
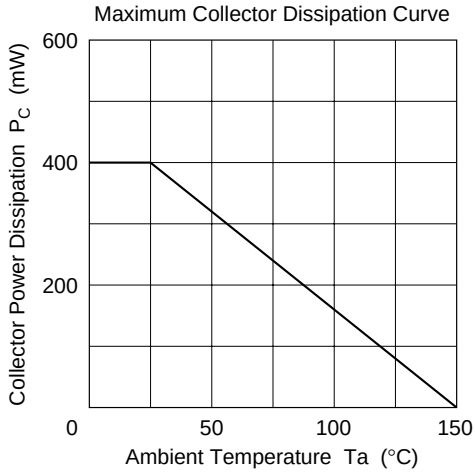


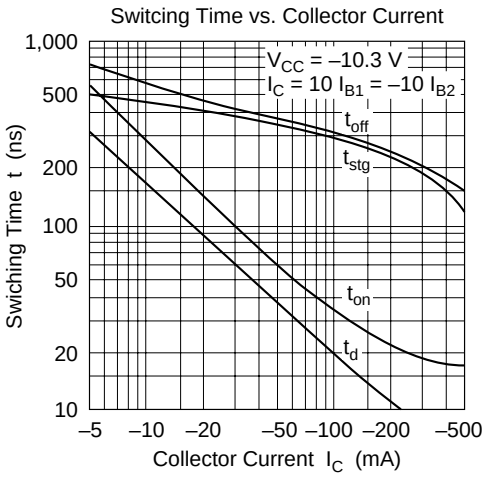
Response Waveform



Response Waveform



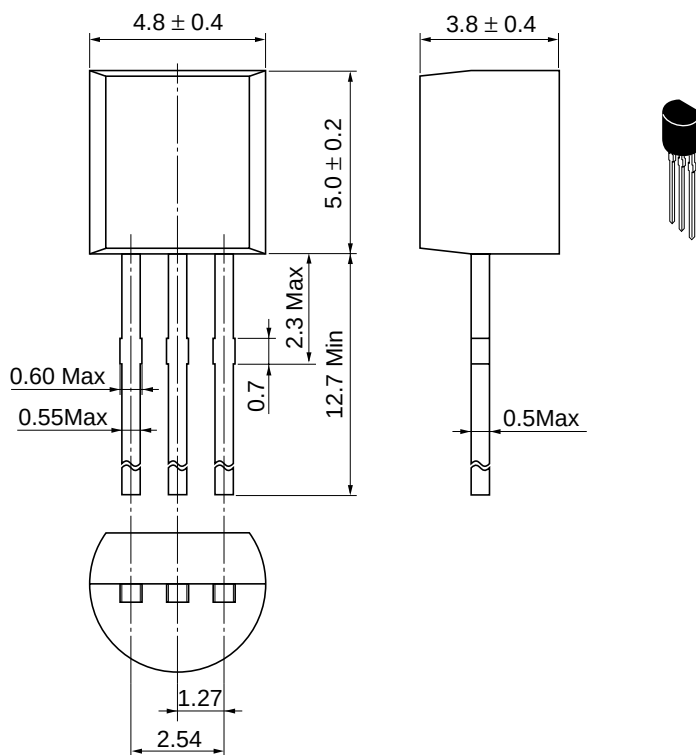




## Package Dimensions

As of January, 2001

Unit: mm



|                        |           |
|------------------------|-----------|
| Hitachi Code           | TO-92 (1) |
| JEDEC                  | Conforms  |
| EIAJ                   | Conforms  |
| Mass (reference value) | 0.25 g    |

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