

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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Keep safety first in your circuit designs!

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# 2SA673A(K)

Silicon PNP Epitaxial

**RENESAS**

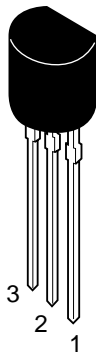
ADE-208-313A (Z)  
2nd. Edition  
Mar. 2001

## Application

- Low frequency amplifier
- Medium speed switching

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

**Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

<b>Item</b>	<b>Symbol</b>	<b>Ratings</b>	<b>Unit</b>
Collector to base voltage	$V_{\text{CBO}}$	-50	V
Collector to emitter voltage	$V_{\text{CEO}}$	-50	V
Emitter to base voltage	$V_{\text{EBO}}$	-4	V
Collector current	$I_{\text{C}}$	-0.5	A
Collector power dissipation	$P_{\text{C}}$	0.4	W
Junction temperature	$T_{\text{J}}$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$

## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	-50	—	—	V	$I_C = -10 \mu A, I_E = 0$
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	$I_E = -10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	-0.5	$\mu A$	$V_{CE} = -20 \text{ V}, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	-0.5	$\mu A$	$V_{EB} = -3 \text{ V}, I_C = 0$
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	—	$\mu s$	$V_{CC} = -10.3 \text{ V}$
Turn off time	$t_{off}$	—	0.6	—	$\mu s$	$I_C = 10 \text{ mA}, I_{B1} = -10 \text{ mA}, I_{B2} = -10 \text{ mA}$
Storage time	$t_{stg}$	—	0.4	—	$\mu s$	$V_{CC} = -5 \text{ V}, I_C = I_{B1} = I_{B2} = -20 \text{ mA}$

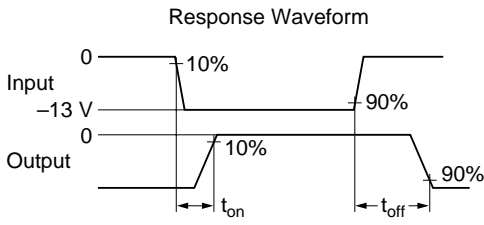
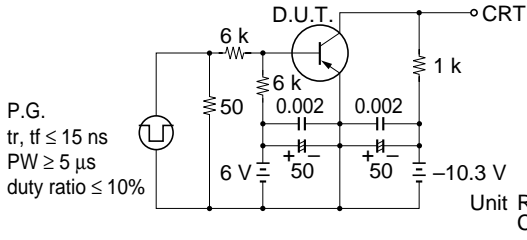
Notes: 1. The 2SA673A(K) is grouped by  $h_{FE}$  as follows.

2. Pulse test

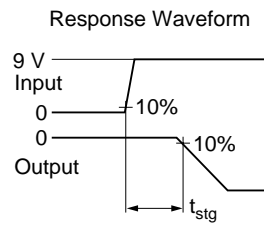
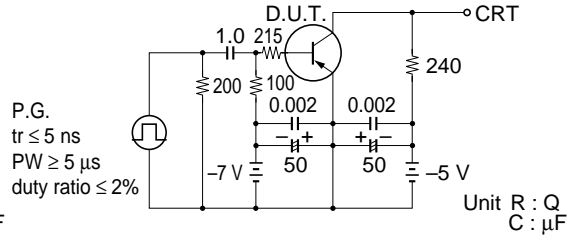
B	C	D
60 to 120	100 to 200	160 to 320

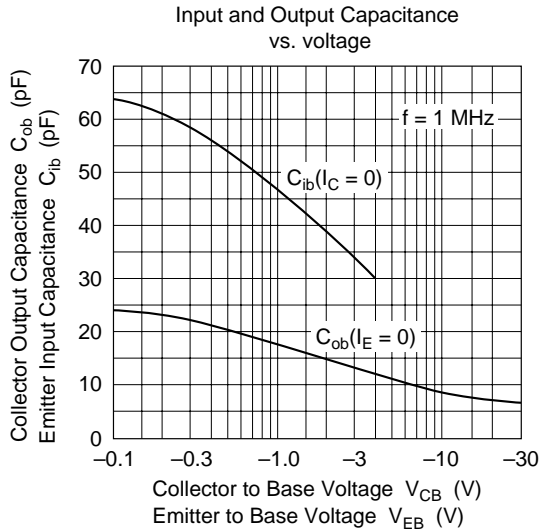
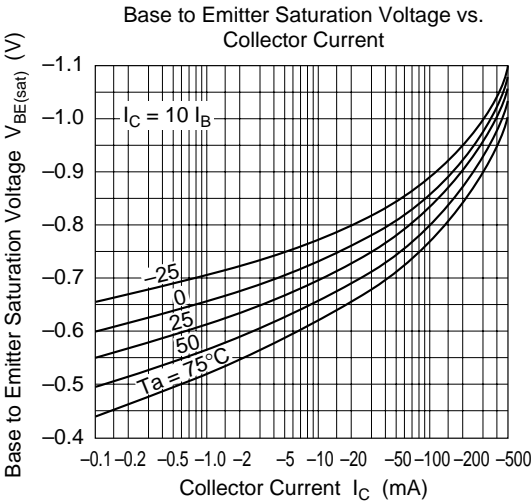
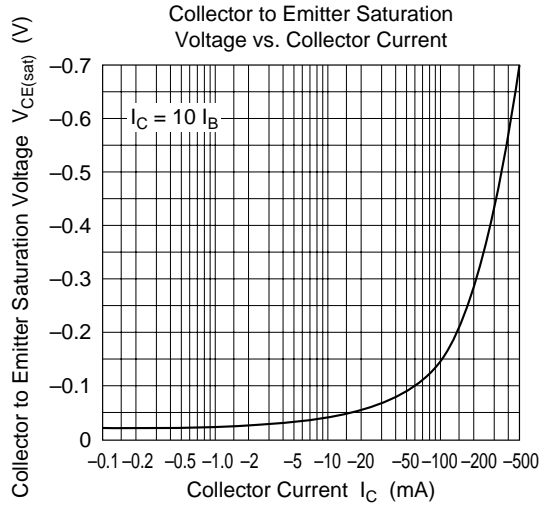
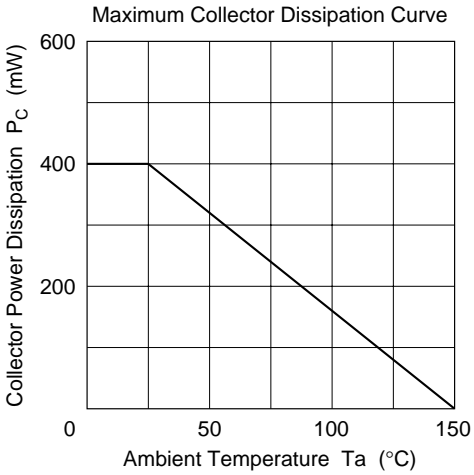
See 2SA673A except for the above – mentioned characteristic curves.

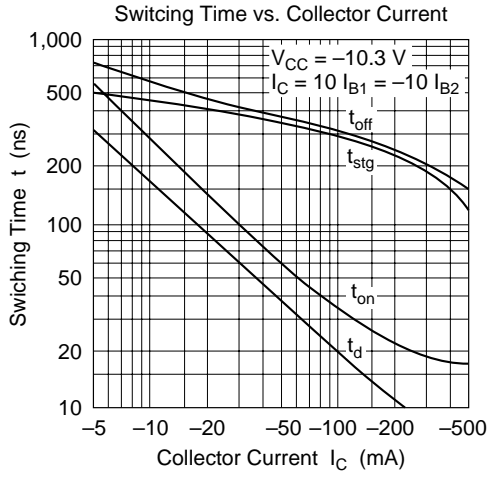
Switching Time Test Circuit  
 $t_{on}$ ,  $t_{off}$  Test Circuit



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



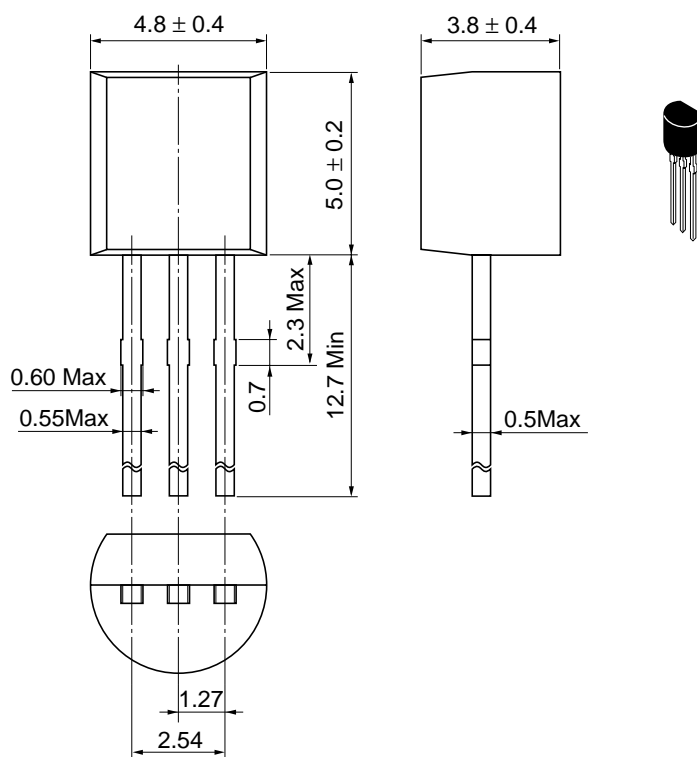






Package Dimensions

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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