

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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# 2SC2396, 2SC2543, 2SC2544

Silicon NPN Epitaxial

**RENESAS**

ADE-208-1062A (Z)  
2nd. Edition  
Mar. 2001

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## Application

- Low frequency amplifier

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

## 2SC2396, 2SC2543, 2SC2544

### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	2SC2396	2SC2543	2SC2544	Unit
Collector to base voltage	$V_{CBO}$	60	90	120	V
Collector to emitter voltage	$V_{CEO}$	60	90	120	V
Emitter to base voltage	$V_{EBO}$	5	5	5	V
Collector current	$I_C$	100	100	100	mA
Emitter current	$I_E$	-100	-100	-100	mA
Collector power dissipation	$P_C$	400	400	400	mW
Junction temperature	$T_j$	150	150	150	°C
Storage temperature	$T_{stg}$	-55 to +150	-55 to +150	-55 to +150	°C

### Electrical Characteristics (Ta = 25°C)

Item	Symbol	2SC2396			2SC2543			2SC2544			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	60	—	—	90	—	—	120	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	60	—	—	90	—	—	120	—	—	V	$I_C = 1 \text{ mA}, R_{BE} =$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	5	—	—	5	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.1	—	—	0.1	—	—	0.1	$\mu A$	$V_{CB} = 50 \text{ V}, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	0.1	—	—	0.1	—	—	0.1	$\mu A$	$V_{EB} = 2 \text{ V}, I_C = 0$
DC current transfer ratio	$h_{FE}^{*1}$	250	—	1200	250	—	1200	250	—	800		$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.2	—	—	0.2	—	—	0.2	V	$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$
Base to emitter voltage	$V_{BE}$	—	0.6	—	—	0.6	—	—	0.6	—	V	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Gain bandwidth product	$f_T$	—	90	—	—	90	—	—	90	—	MHz	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	3.0	—	—	3.0	—	—	3.0	—	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$

Note: 1. The 2SC2396, 2SC2543 and 2SC2544 are grouped by  $h_{FE1}$  as follows.

	D	E	F
2SC2396, 2SC2543	250 to 500	400 to 800	600 to 1200
2SC2544	250 to 500	400 to 800	—

See characteristic curves of 2SC2545, 2SC2546 and 2SC2547.

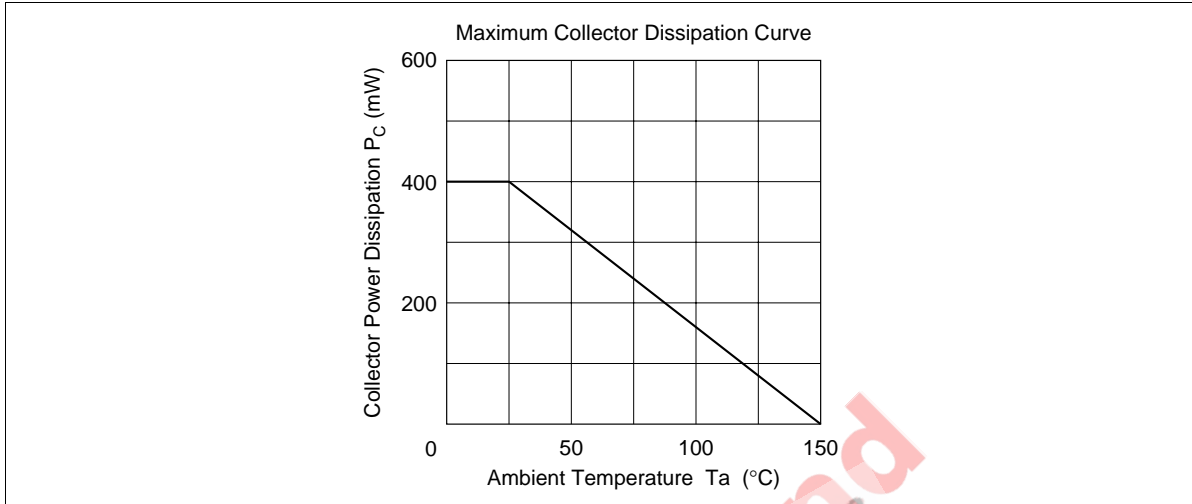
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**2SC2396, 2SC2543, 2SC2544**

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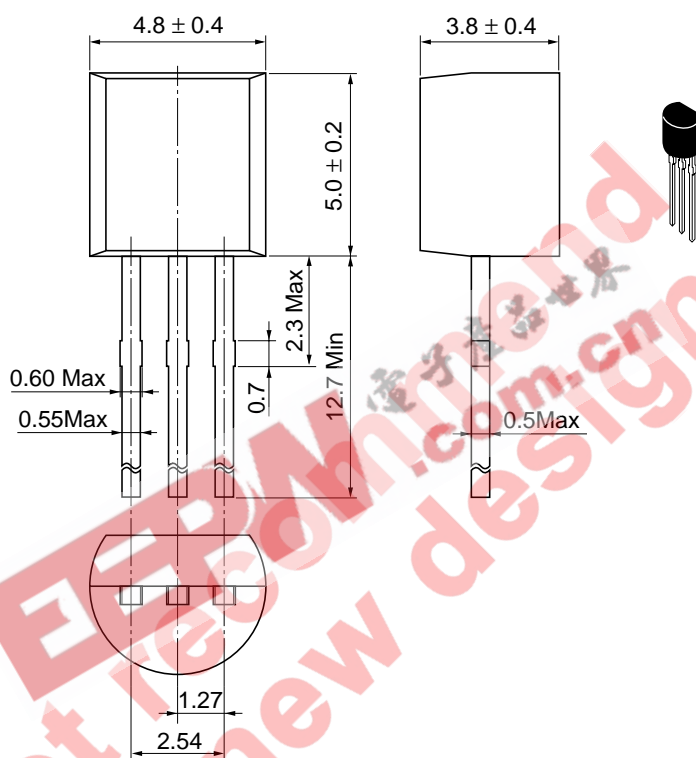


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## 2SC2396, 2SC2543, 2SC2544

### 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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