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# 2SC2309

Silicon NPN Epitaxial

# HITACHI

ADE-208-1061 (Z)  
1st. Edition  
Mar. 2001

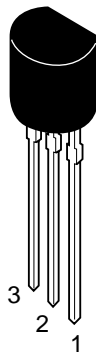
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## Application

Low frequency amplifier

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

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

Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{\text{CBO}}$	55	V
Collector to emitter voltage	$V_{\text{CEO}}$	50	V
Emitter to base voltage	$V_{\text{EBO}}$	5	V
Collector current	$I_{\text{C}}$	100	mA
Collector power dissipation	$P_{\text{C}}$	200	mW
Junction temperature	$T_{\text{j}}$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$

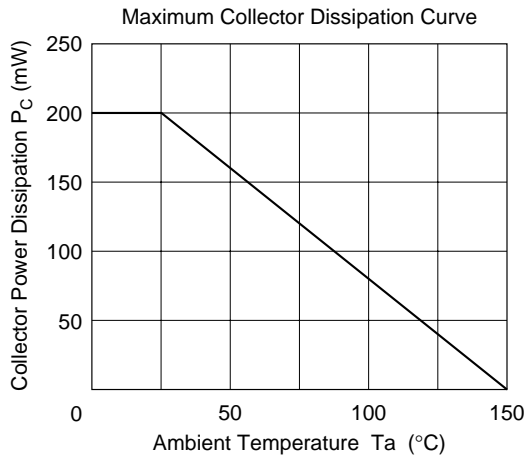
**Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	55	—	—	V	$I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$
Collector to emitter breakdown voltage	$V_{(\text{BR})\text{CEO}}$	50	—	—	V	$I_{\text{C}} = 1 \text{ mA}, R_{\text{BE}} = \infty$
Emitter to base breakdown voltage	$V_{(\text{BR})\text{EBO}}$	5	—	—	V	$I_{\text{E}} = 10 \mu\text{A}, I_{\text{C}} = 0$
Collector cutoff current	$I_{\text{CBO}}$	—	—	0.5	$\mu\text{A}$	$V_{\text{CB}} = 18 \text{ V}, I_{\text{E}} = 0$
Emitter cutoff current	$I_{\text{EBO}}$	—	—	0.5	$\mu\text{A}$	$V_{\text{EB}} = 2 \text{ V}, I_{\text{C}} = 0$
DC current transfer ratio	$h_{\text{FE}}^{*1}$	250	—	1200		$V_{\text{CE}} = 12 \text{ V}, I_{\text{C}} = 2 \text{ mA}$
Base to emitter voltage	$V_{\text{BE}}$	—	—	0.75	V	$V_{\text{CE}} = 12 \text{ V}, I_{\text{C}} = 2 \text{ mA}$
Collector to emitter saturation voltage	$V_{\text{CE}(\text{sat})}$	—	—	0.2	V	$I_{\text{C}} = 10 \text{ mA}, I_{\text{B}} = 1 \text{ mA}$
Gain bandwidth product	$f_{\text{T}}$	—	230	—	MHz	$V_{\text{CE}} = 12 \text{ V}, I_{\text{C}} = 2 \text{ mA}$
Collector output capacitance	$C_{\text{ob}}$	—	1.8	3.5	pF	$V_{\text{CB}} = 10 \text{ V}, I_{\text{E}} = 0, f = 1 \text{ MHz}$

Note: 1. The 2SC2309 is grouped by  $h_{\text{FE}}$  as follows.

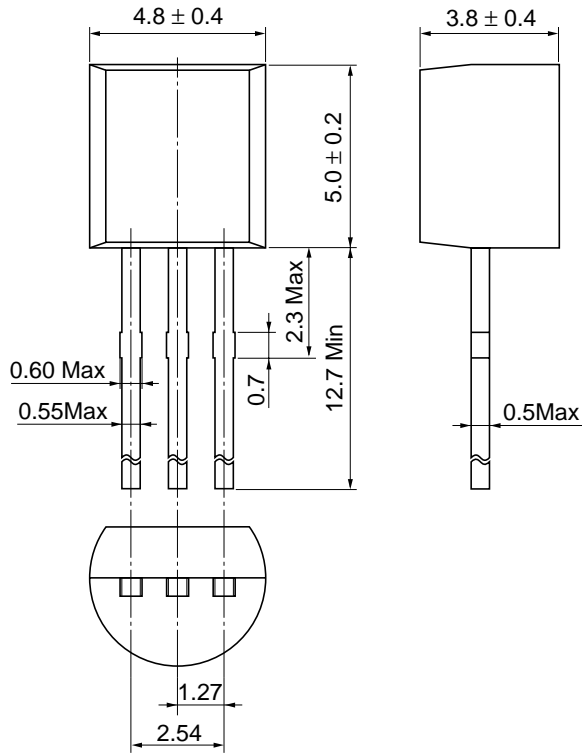
D	E	F
250 to 500	400 to 800	600 to 1200

See characteristic curves of 2SC1345.



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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# HITACHI

## Hitachi, Ltd.

Semiconductor & Integrated Circuits.  
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan  
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL	NorthAmerica	: <a href="http://semiconductor.hitachi.com/">http://semiconductor.hitachi.com/</a>
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### For further information write to:

Hitachi Semiconductor  
(America) Inc.  
179 East Tasman Drive,  
San Jose, CA 95134  
Tel: <1> (408) 433-1990  
Fax: <1> (408) 433-0223

Hitachi Europe GmbH  
Electronic Components Group  
Dornacher Straße 3  
D-85622 Feldkirchen, Munich  
Germany  
Tel: <49> (89) 9 9180-0  
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.  
Electronic Components Group.  
Whitebrook Park  
Lower Cookham Road  
Maidenhead  
Berkshire SL6 8YA, United Kingdom  
Tel: <44> (1628) 585000  
Fax: <44> (1628) 585160

Hitachi Asia Ltd.  
Hitachi Tower  
16 Collyer Quay #20-00,  
Singapore 049318  
Tel: <65>-538-6533/538-8577  
Fax: <65>-538-6933/538-3877  
URL: <http://www.hitachi.com.sg>

Hitachi Asia Ltd.  
(Taipei Branch Office)  
4/F, No. 167, Tun Hwa North Road,  
Hung-Kuo Building,  
Taipei (105), Taiwan  
Tel: <886>-(2)-2718-3666  
Fax: <886>-(2)-2718-8180  
Telex: 23222 HAS-TP  
URL: <http://www.hitachi.com.tw>

Hitachi Asia (Hong Kong) Ltd.  
Group III (Electronic Components)  
7/F., North Tower,  
World Finance Centre,  
Harbour City, Canton Road  
Tsim Sha Tsui, Kowloon,  
Hong Kong  
Tel: <852>-(2)-735-9218  
Fax: <852>-(2)-730-0281  
URL: <http://www.hitachi.com.hk>

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