

To all our customers

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

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# 2SA1084, 2SA1085

Silicon PNP Epitaxial

**RENESAS**

ADE-208-1007A (Z)  
2nd. Edition  
Mar. 2001

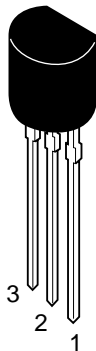
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## Application

- Low frequency low noise amplifier

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

2SA1084, 2SA1085

Absolute Maximum Ratings (Ta = 25°C)zz

Item	Symbol	2SA1084	2SA1085	Unit
Collector to base voltage	V <sub>CBO</sub>	−90	−120	V
Collector to emitter voltage	V <sub>CEO</sub>	−90	−120	V
Emitter to base voltage	V <sub>EB0</sub>	−5	−5	V
Collector current	I <sub>C</sub>	−100	−100	mA
Emitter current	I <sub>E</sub>	100	100	mA
Collector power dissipation	P <sub>C</sub>	400	400	mW
Junction temperature	T <sub>j</sub>	150	150	°C
Storage temperature	T <sub>stg</sub>	−55 to +150	−55 to +150	°C

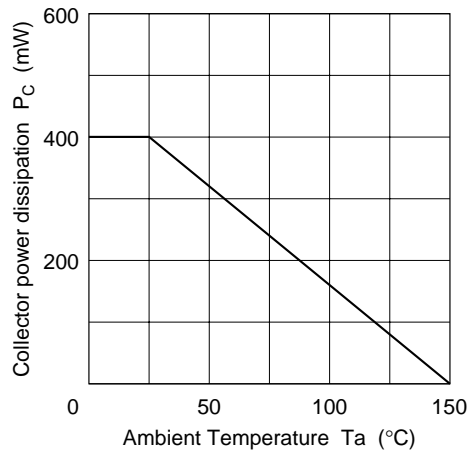
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	2SA1084			2SA1085			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	-90	—	—	-120	—	—	V	$I_C = -10\text{ }\mu\text{A}$ , $I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	-90	—	—	-120	—	—	V	$I_C = -1\text{ mA}$ , $R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	-5	—	—	-5	—	—	V	$I_E = -10\text{ }\mu\text{A}$ , $I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	-0.1	—	—	-0.1	$\mu\text{A}$	$V_{CB} = -50\text{ V}$ , $I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	-0.1	—	—	-0.1	$\mu\text{A}$	$V_{EB} = -2\text{ V}$ , $I_C = 0$
DC current transfer ratio	$h_{FE}^{*1}$	250	—	800	250	—	800		$V_{CE} = -12\text{ V}$ , $I_C = -2\text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	-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	—	V	$V_{CE} = -12\text{ V}$ , $I_C = -2\text{ mA}$
Gain bandwidth product	$f_T$	—	90	—	—	90	—	MHz	$V_{CE} = -12\text{ V}$ , $I_C = -2\text{ mA}$
Collector output capacitance	$C_{ob}$	—	3.5	—	—	3.5	—	pF	$V_{CB} = -10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$
Noise voltage referred to input	$e_n$	—	0.5	—	—	0.5	—	$\text{nV}/\sqrt{\text{Hz}}$	$V_{CE} = -6\text{ V}$ , $I_C = -10\text{ mA}$ , $f = 1\text{ kHz}$ , $R_g = 0$ , $\Delta f = 1\text{ Hz}$

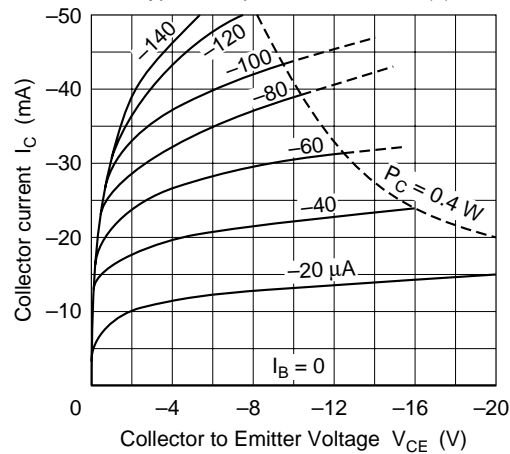
Note: 1. The 2SA1084 and 2SA1085 are grouped by  $h_{FE}$  as follows.

D	E
250 to 500	400 to 800

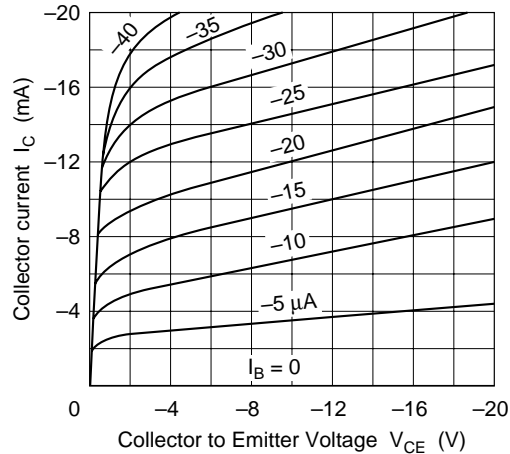
Maximum Collector Dissipation Curve



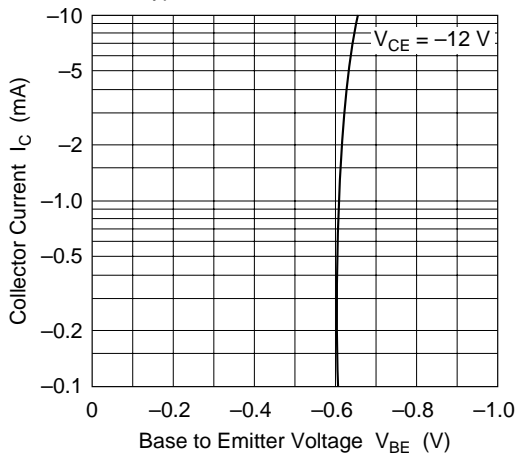
Typical Output Characteristics (1)



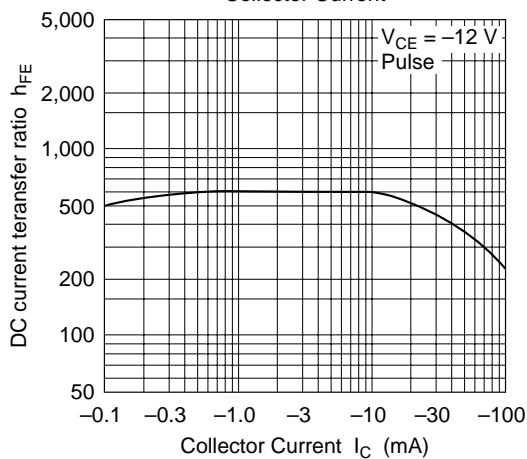
Typical Output Characteristics (2)



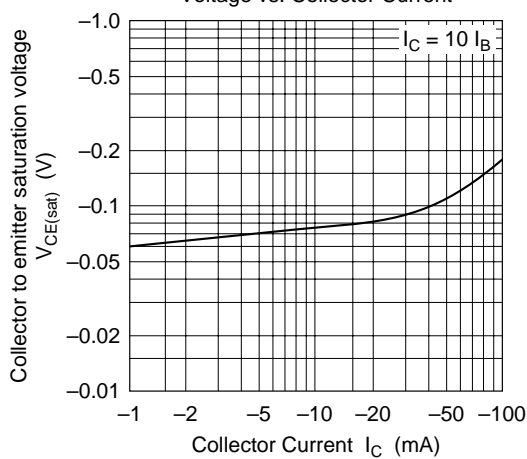
Typical Transfer Characteristics



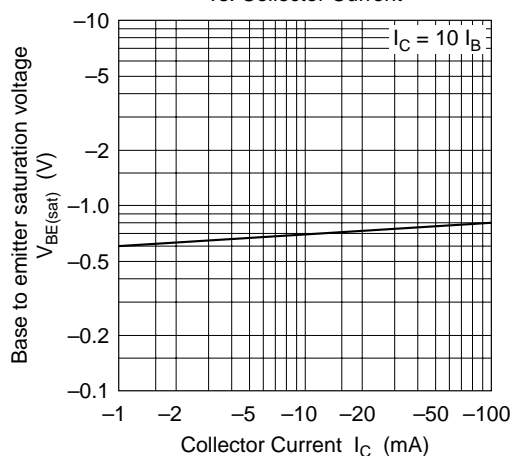
DC Current Transfer Ratio vs.  
Collector Current



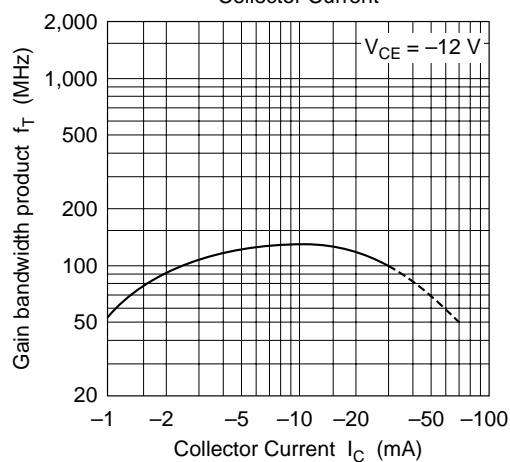
Collector to Emitter Saturation  
Voltage vs. Collector Current



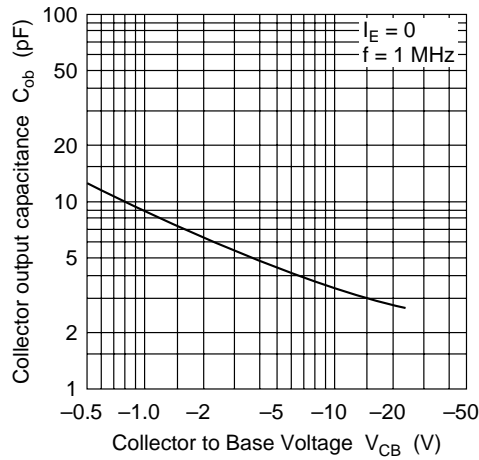
Base to Emitter Saturation Voltage  
vs. Collector Current



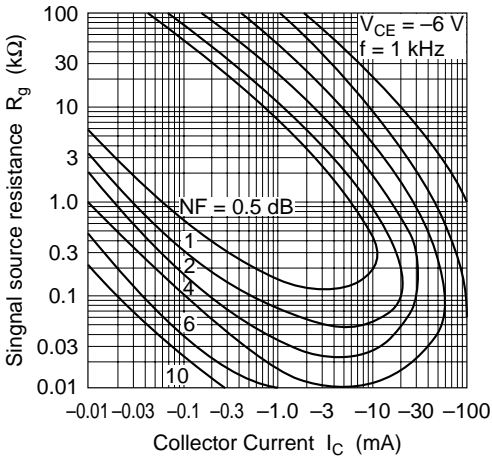
Gain Bandwidth Product vs.  
Collector Current



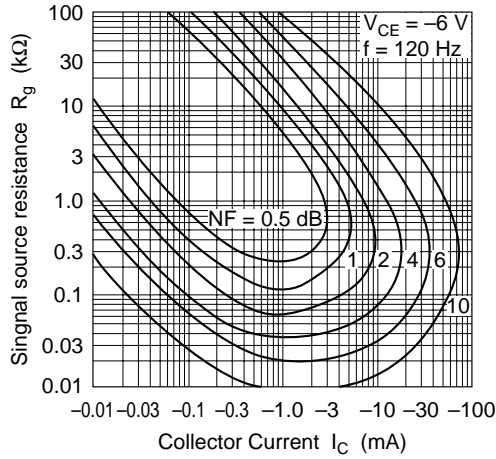
Collector Output Capacitance vs.  
Collector to Base Voltage



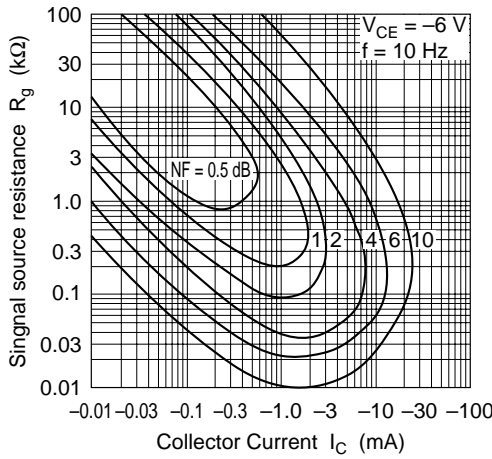
Contours of Constant Noise Figure (1)



Contours of Constant Noise Figure (2)



Contours of Constant Noise Figure (3)

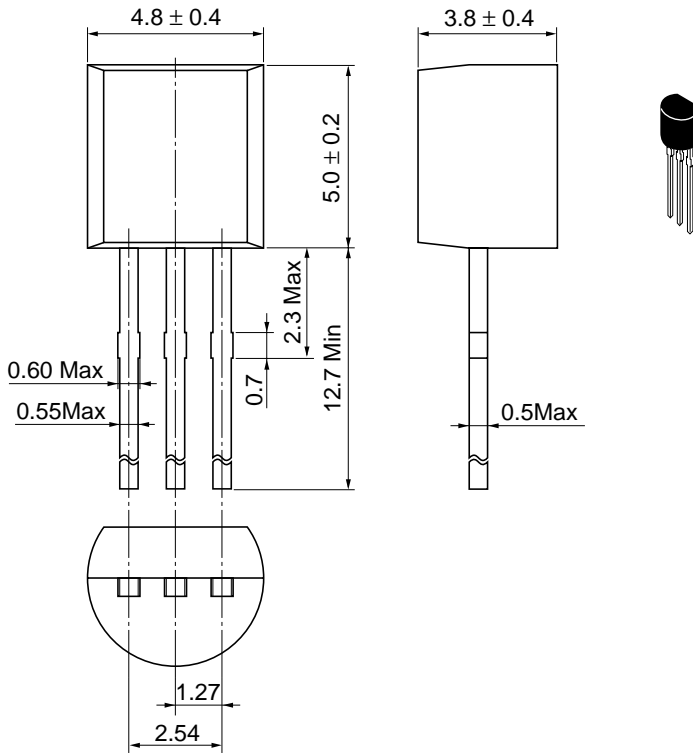




# Package Dimensions

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 &amp; 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>
	Europe	: <a href="http://www.hitachi-eu.com/hel/ecg">http://www.hitachi-eu.com/hel/ecg</a>
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**For further information write to:**Hitachi Semiconductor  
(America) Inc.179 East Tasman Drive,  
San Jose, CA 95134

Tel: &lt;1&gt; (408) 433-1990

Fax: &lt;1&gt; (408) 433-0223

Hitachi Europe GmbH  
Electronic Components GroupDornacher Straße 3  
D-85622 Feldkirchen, Munich

Germany

Tel: &lt;49&gt; (89) 9 9180-0

Fax: &lt;49&gt; (89) 9 29 30 00

Hitachi Europe Ltd.

Electronic Components Group.

Whitebrook Park

Lower Cookham Road

Maidenhead

Berkshire SL6 8YA, United Kingdom

Tel: &lt;44&gt; (1628) 585000

Fax: &lt;44&gt; (1628) 585160

Hitachi Asia Ltd.

Hitachi Tower

16 Collyer Quay #20-00,

Singapore 049318

Tel: &lt;65&gt;-538-6533/538-8577

Fax: &lt;65&gt;-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: &lt;886&gt;-(2)-2718-3666

Fax: &lt;886&gt;-(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: &lt;852&gt;-(2)-735-9218

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