

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!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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# 2SD1868, 2SD1869

Silicon NPN Epitaxial

**RENESAS**

ADE-208-1159 (Z)  
1st. Edition  
Mar. 2001

## Application

Low frequency high voltage amplifier

## Outline

TO-92MOD



1. Emitter
2. Collector
3. Base

## 2SD1868, 2SD1869

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

Item	Symbol	2SA1868	2SA1869	Unit
Collector to base voltage	$V_{CBO}$	160	200	V
Collector to emitter voltage	$V_{CEO}$	160	200	V
Emitter to base voltage	$V_{EBO}$	5	5	V
Collector current	$I_C$	100	100	mA
Collector power dissipation	$P_C$	0.9	0.9	W
Junction temperature	$T_j$	150	150	°C
Storage temperature	$T_{stg}$	-55 to +150	-55 to +150	°C

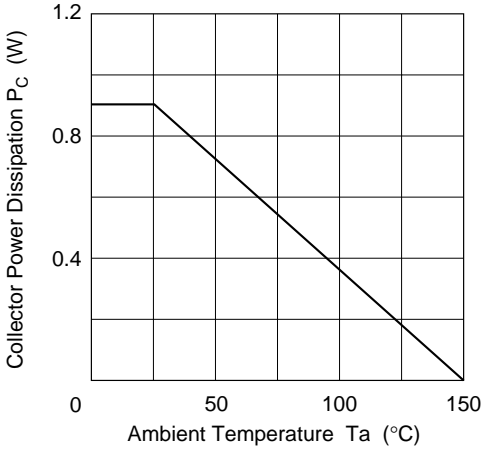
### Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	2SD1868 $V_{(BR)CBO}$	160	—	—	V	$I_C = 10 \mu A, I_E = 0$
	2SD1869	200	—	—		
Collector to emitter breakdown voltage	2SD1868 $V_{(BR)CEO}$	160	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
	2SD1869	200	—	—		
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	2SD1868 $I_{CBO}$	—	—	10	$\mu A$	$V_{CB} = 140 \text{ V}, I_E = 0$
	2SD1869	—	—	—		$V_{CB} = 160 \text{ V}, I_E = 0$
DC current transfer ratio	$h_{FE1}^{*1}$	60	—	320		$V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$
	$h_{FE2}$	30	—	—		$V_{CE} = 5 \text{ V}, I_C = 1 \text{ mA}$
Base to emitter voltage	$V_{BE}$	—	—	1.5	V	$V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	2	V	$I_C = 30 \text{ mA}, I_B = 3 \text{ mA}$
Gain bandwidth product	$f_T$	—	140	—	MHz	$V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	3.8	—	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$

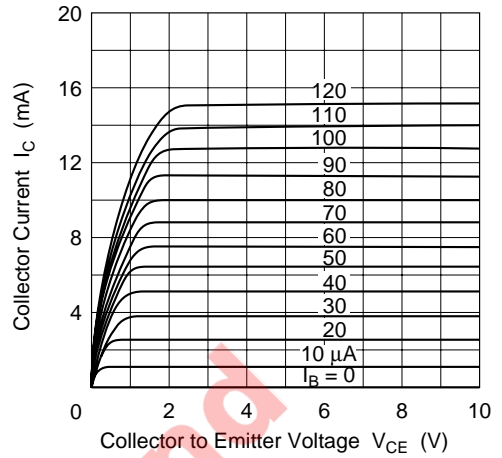
Note: 1. The 2SD1868 and 2SD1869 are grouped by  $h_{FE1}$  as follows.

Grade	B	C	D
$h_{FE1}$	60 to 120	100 to 200	160 to 320

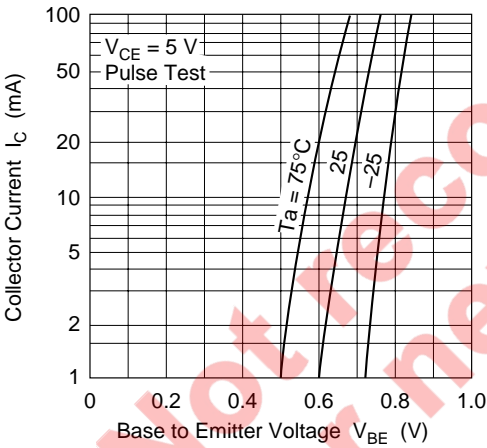
Maximum Collector Dissipation Curve



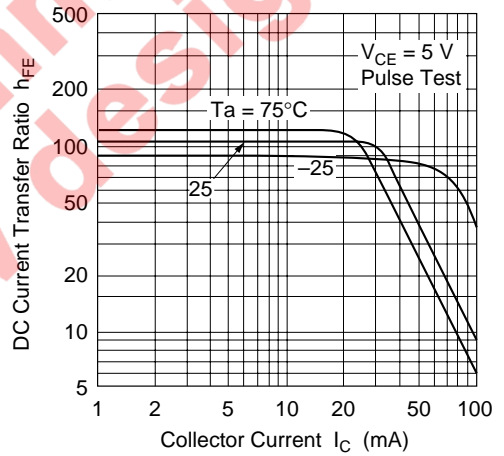
Typical Output Characteristics

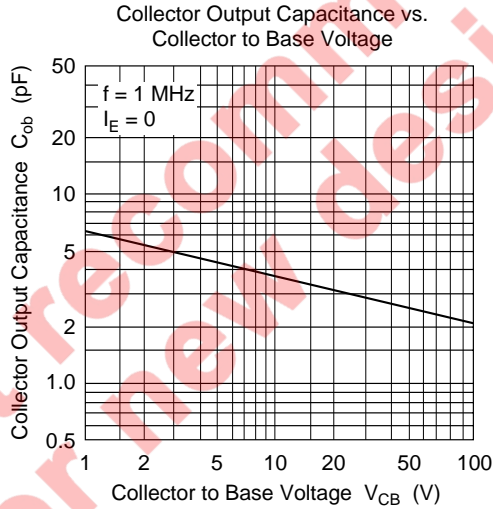
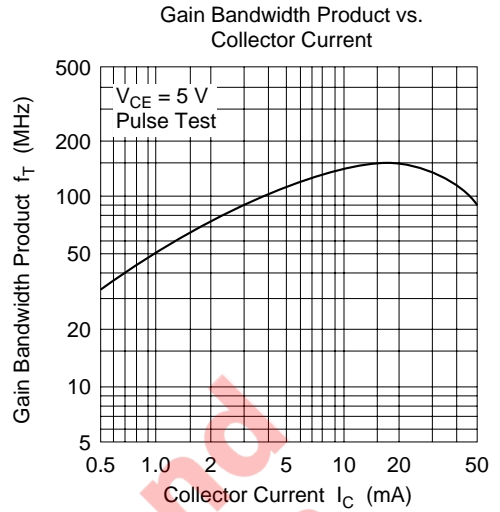
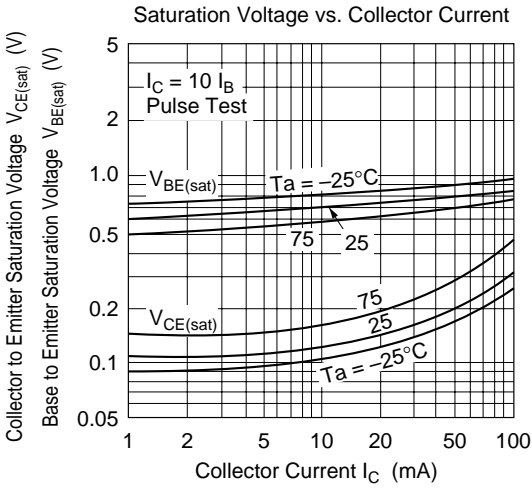


Typical Transfer Characteristics



DC Current Transfer Ratio vs. Collector Current

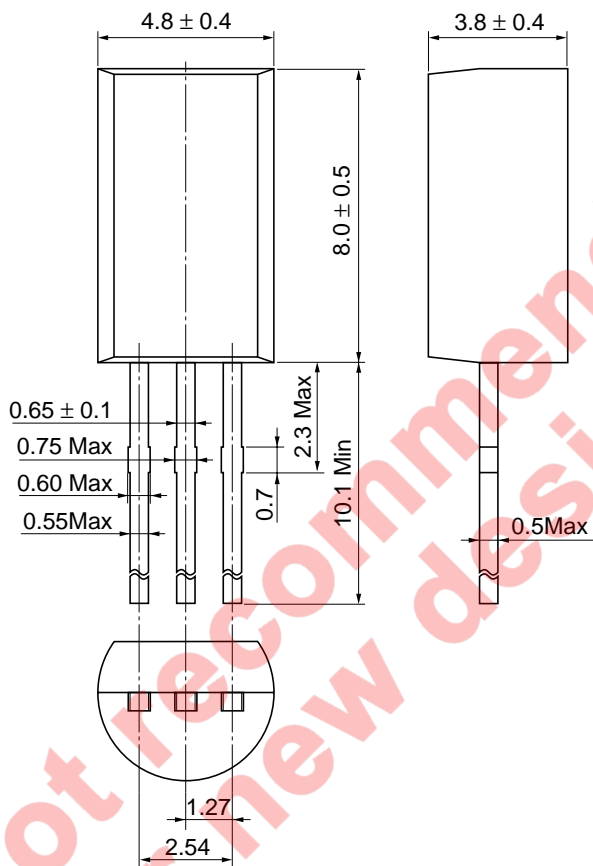




Package Dimensions

As of January, 2001

Unit: mm



Hitachi Code	TO-92 Mod
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.35 g

## Cautions

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