

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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# 2SC2855, 2SC2856

Silicon NPN Epitaxial

**RENESAS**

ADE-208-1079 (Z)

1st. Edition

Mar. 2001

## Application

- Low frequency low noise amplifier
- Complementary pair with 2SA1190 and 2SA1191

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	2SC2855	2SC2856	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

Not recommended  
for new design

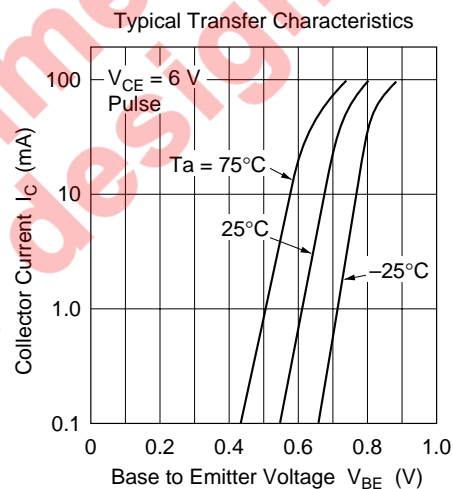
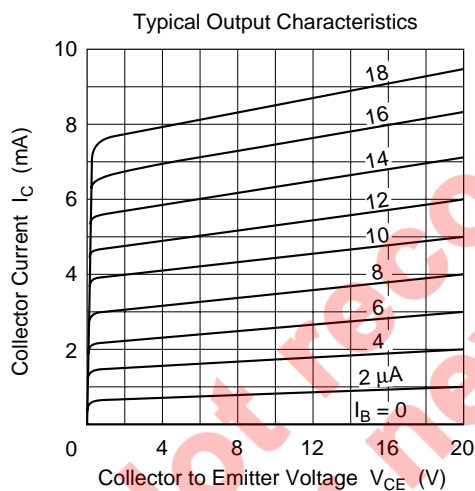
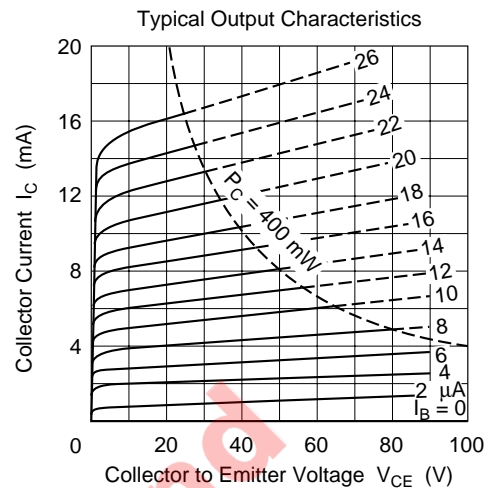
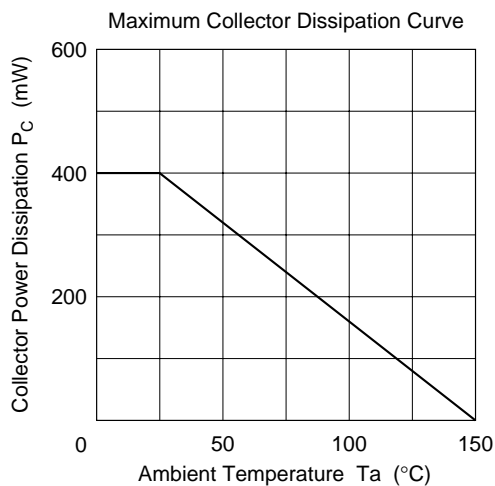
## Electrical Characteristics (Ta = 25°C)

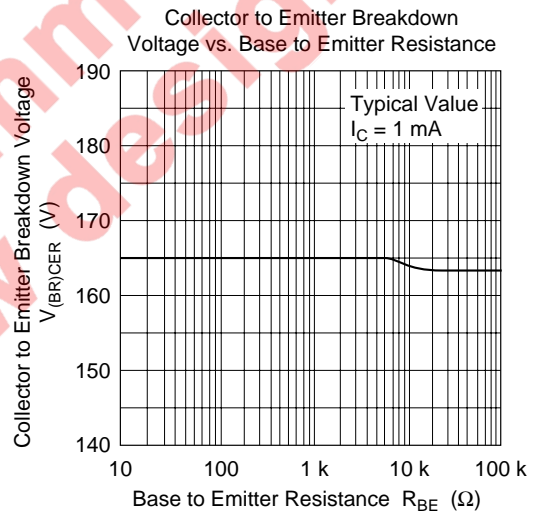
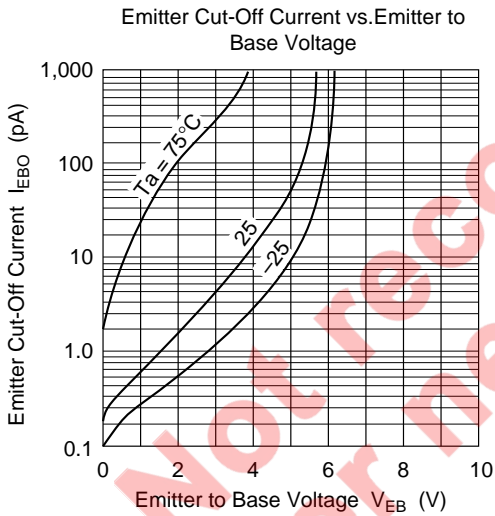
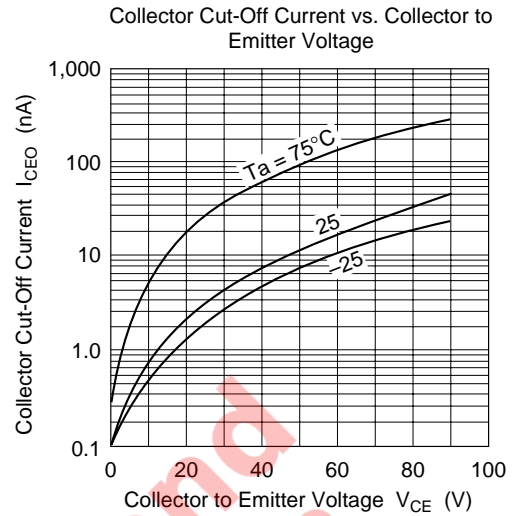
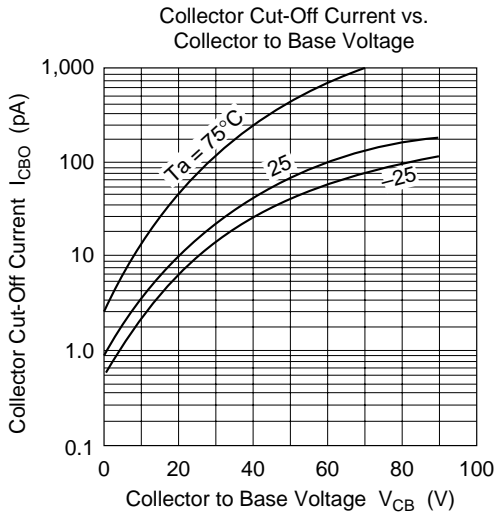
Item	Symbol	2SC2855			2SC2856			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	90	—	—	120	—	—	V	$I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	90	—	—	120	—	—	V	$I_C = 1\text{ mA}$ , $R_{BE} =$
Emitter 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	$\mu\text{A}$	$V_{CB} = 70\text{ V}$ , $I_E = 0$
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		$V_{CE} = 12\text{ V}$ , $I_C = 2\text{ mA}^{*2}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	0.05	0.10	—	0.05	0.10	V	$I_C = 10\text{ mA}$ , $I_B = 1\text{ mA}^{*2}$
Base to emitter saturation voltage	$V_{BE(sat)}$	—	0.7	1.0	—	0.7	1.0	V	
Gain bandwidth product	$f_T$	—	310	—	—	310	—	MHz	$V_{CE} = 6\text{ V}$ , $I_C = 10\text{ mA}$
Collector output capacitance	$C_{ob}$	—	3	—	—	3	—	pF	$V_{CB} = 10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$
Noise figure	NF	—	0.15	1.5	—	0.15	1.5	dB	$V_{CE} = 6\text{ V}$ , $I_C = 0.1\text{ mA}$ , $R_g = 10\text{ k}\Omega$ , $f = 1\text{ kHz}$
		—	0.2	2.0	—	0.2	2.0	dB	$V_{CE} = 6\text{ V}$ , $I_C = 0.1\text{ mA}$ , $R_g = 10\text{ k}\Omega$ , $f = 10\text{ Hz}$
Noise voltage referred to input	$e_n$	—	0.7	—	—	0.7	—	$\text{nV}/\sqrt{\text{Hz}}$	$V_{CE} = 6\text{ V}$ , $I_C = 10\text{ mA}$ , $R_g = 0$ , $f = 1\text{ kHz}$

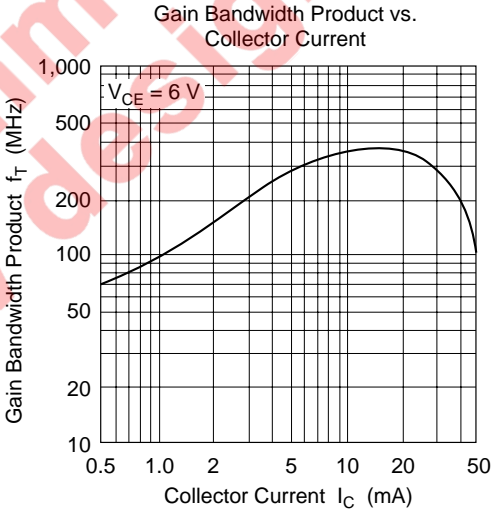
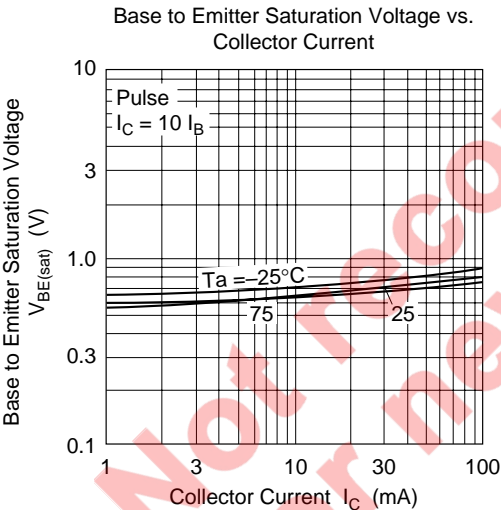
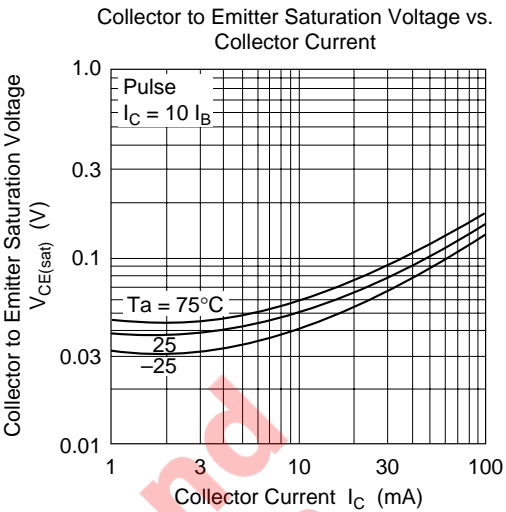
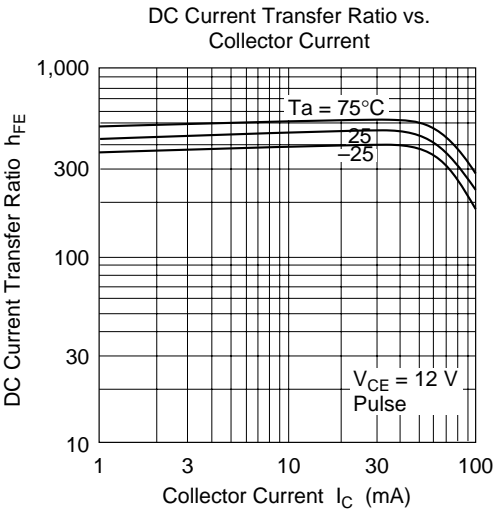
Notes: 1. The 2SC2855 and 2SC2856 are grouped by  $h_{FE}$  as follows.

2. Pulse test

D	E
250 to 500	400 to 800

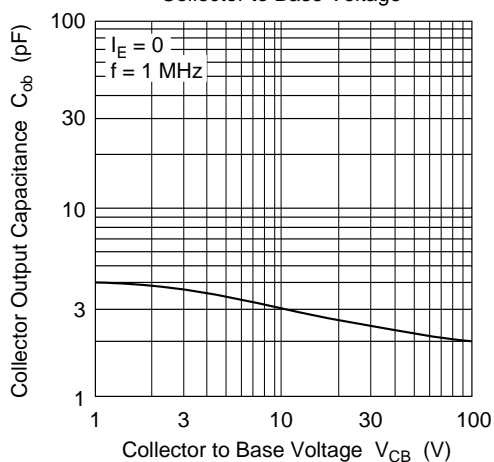




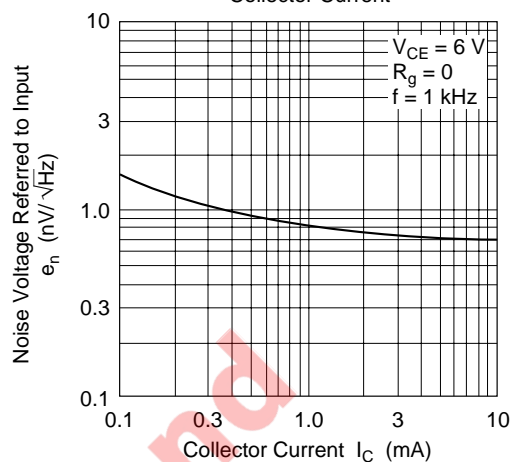




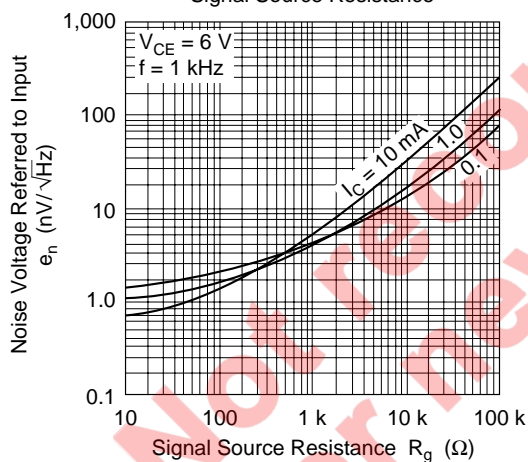
Collector Output Capacitance vs.  
Collector to Base Voltage



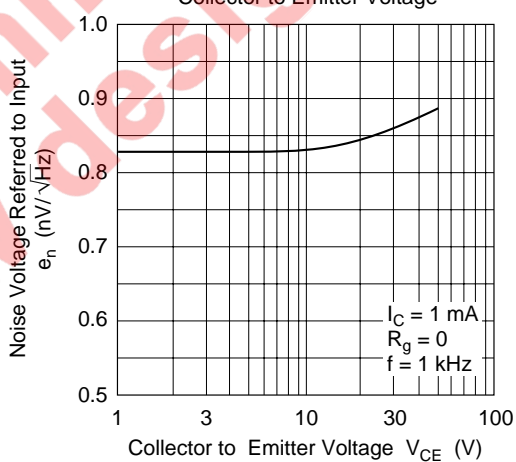
Noise Voltage Referred to Input vs.  
Collector Current



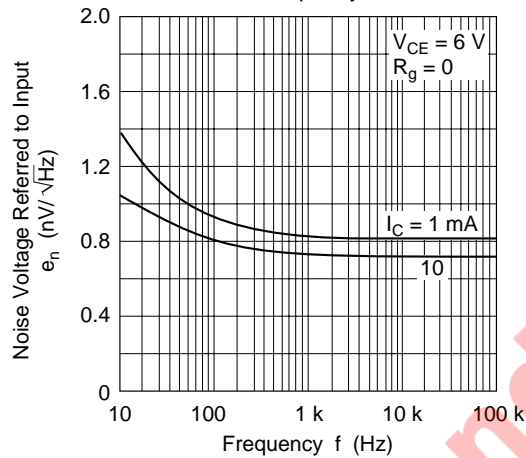
Noise Voltage Referred to Input vs.  
Signal Source Resistance



Noise Voltage Referred to Input vs.  
Collector to Emitter Voltage



Noise Voltage Referred to Input vs.  
Frequency

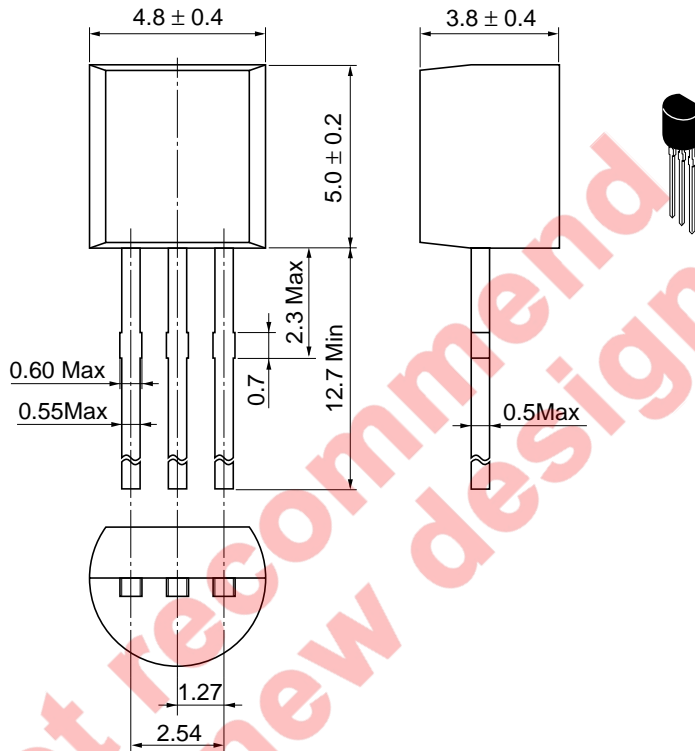


Not recommended  
for new design

## 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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