

To our customers,

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## Old Company Name in Catalogs and Other Documents

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On April 1<sup>st</sup>, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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Not recommended  
for new design

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To all our customers

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

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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

## 2SC2855, 2SC2856

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

Item	Symbol	2SC2855	2SC2856	Unit
Collector to base voltage	$V_{CBO}$	90	120	V
Collector to emitter voltage	$V_{CEO}$	90	120	V
Emitter to base voltage	$V_{EBO}$	5	5	V
Collector current	$I_C$	100	100	mA
Emitter current	$I_E$	-100	-100	mA
Collector power dissipation	$P_C$	400	400	mW
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	-55 to +150	-55 to +150	°C

Not recommended  
for new design

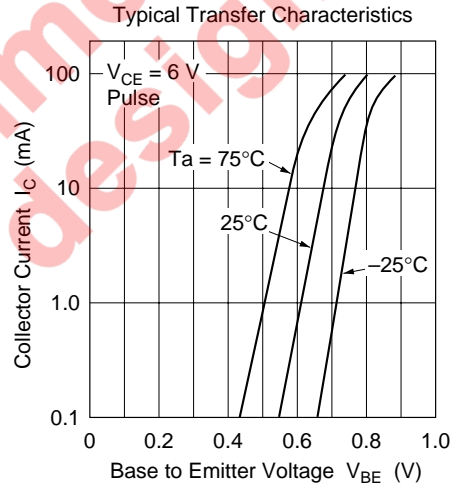
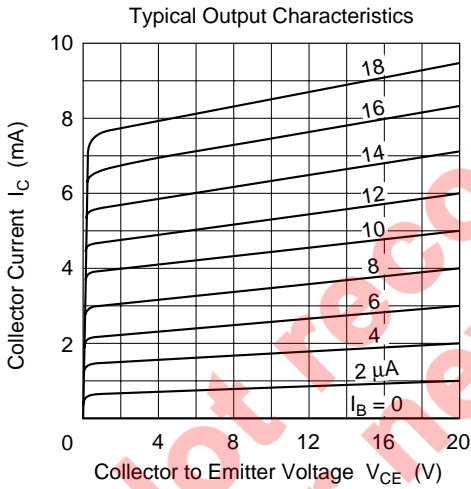
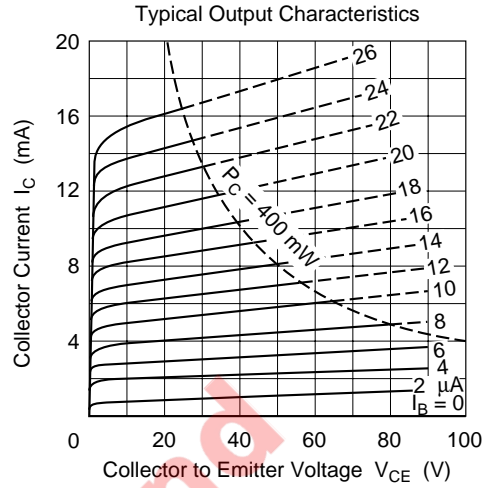
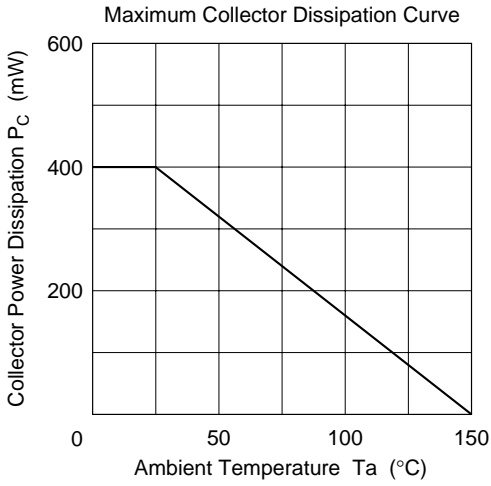
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	2SC2855			2SC2856			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	90	—	—	120	—	—	V	$I_C = 10 \mu A, I_E = 0$
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	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.1	—	—	0.1	$\mu A$	$V_{CB} = 70 \text{ V}, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	0.1	—	—	0.1	$\mu A$	$V_{EB} = 2 \text{ V}, I_C = 0$
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	—	$nV/\sqrt{Hz}$	$V_{CE} = 6 \text{ V}, I_C = 10 \text{ mA}, R_g = 0, f = 1 \text{ kHz}$

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

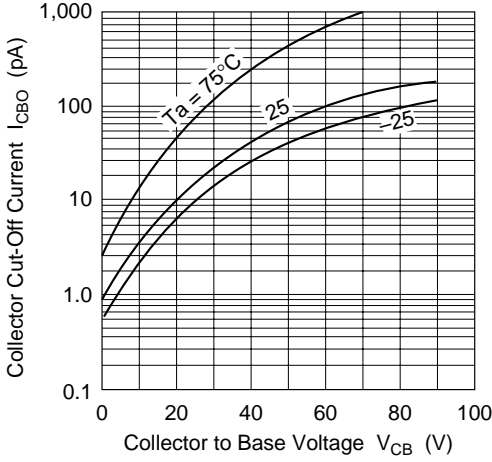
2. Pulse test

D	E
250 to 500	400 to 800

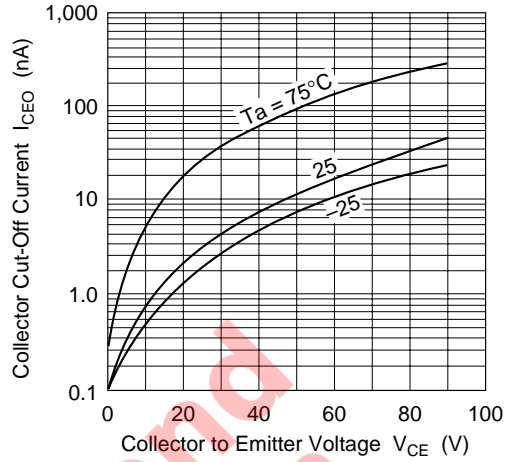




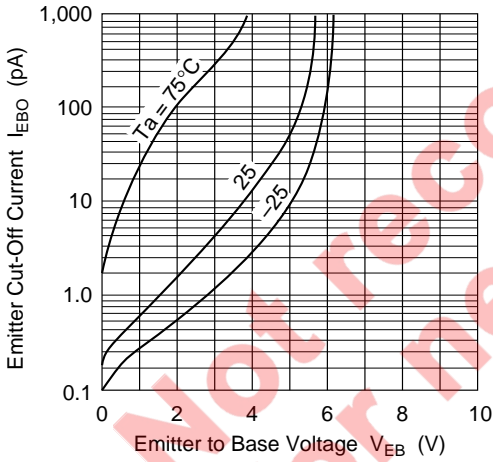
Collector Cut-Off Current vs. Collector to Base Voltage



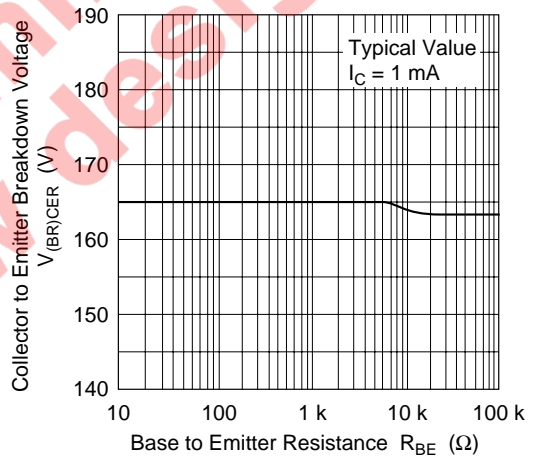
Collector Cut-Off Current vs. Collector to Emitter Voltage



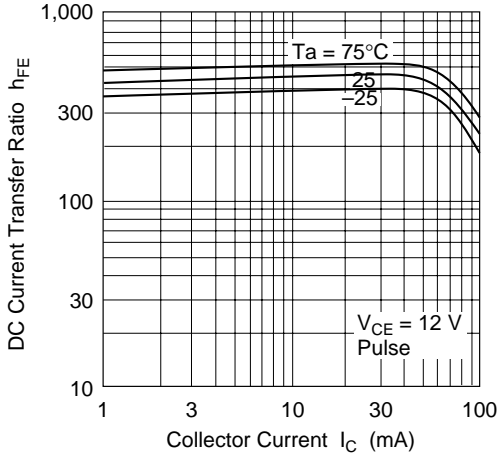
Emitter Cut-Off Current vs. Emitter to Base Voltage



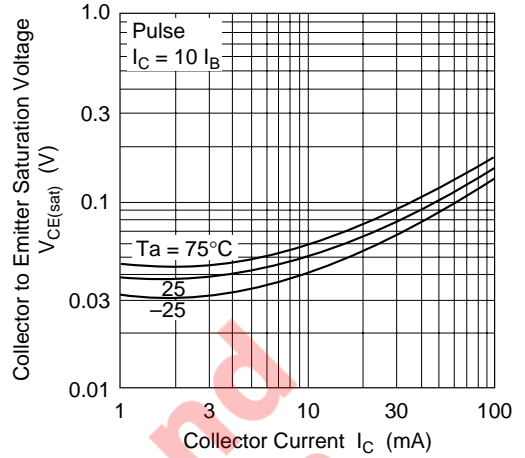
Collector to Emitter Breakdown Voltage vs. Base to Emitter Resistance



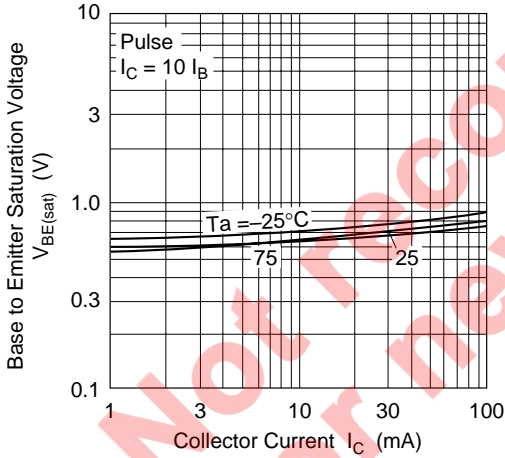
DC Current Transfer Ratio vs. Collector Current



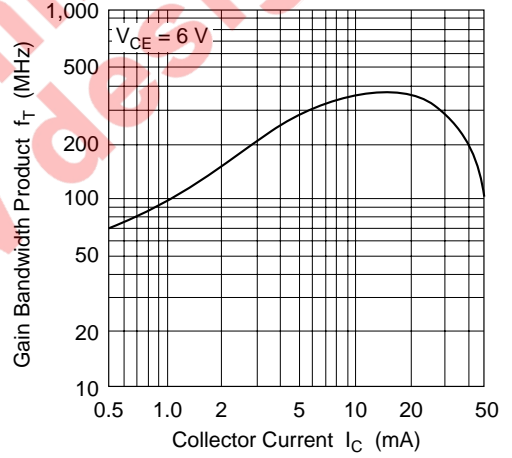
Collector to Emitter Saturation Voltage vs. Collector Current

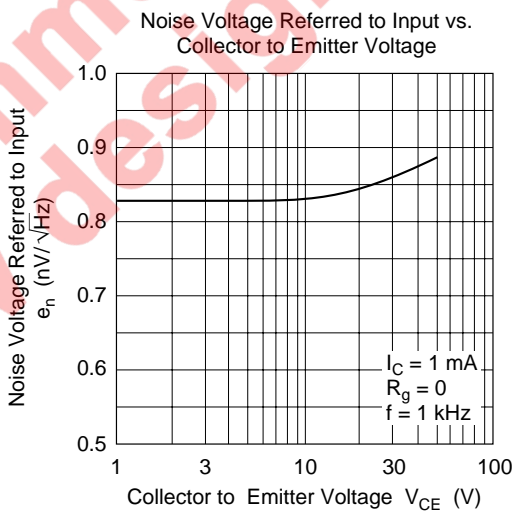
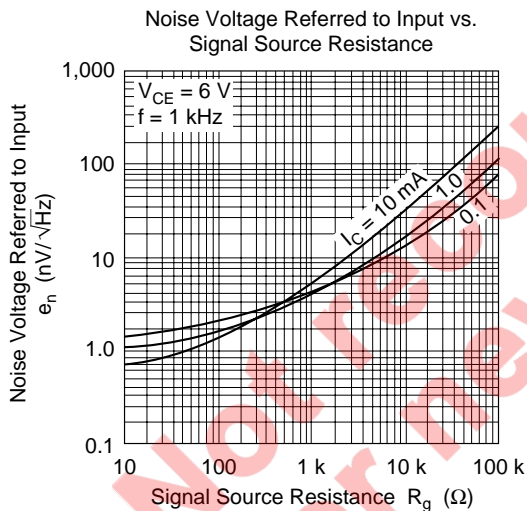
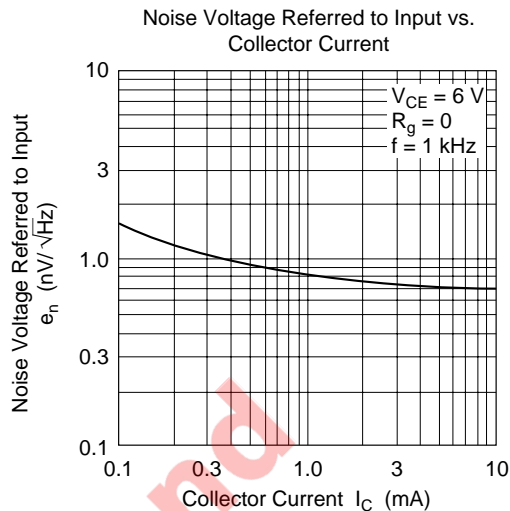
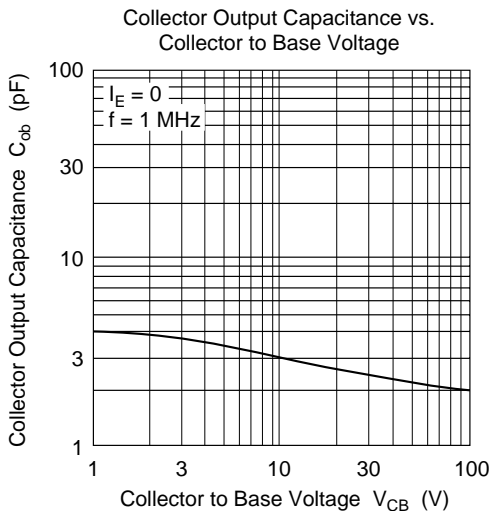


Base to Emitter Saturation Voltage vs. Collector Current

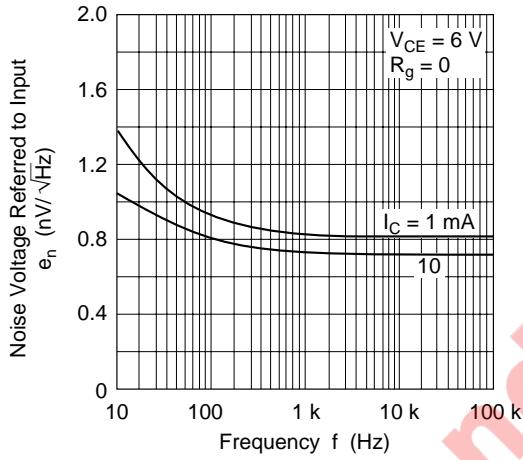


Gain Bandwidth Product vs. Collector Current





Noise Voltage Referred to Input vs. Frequency

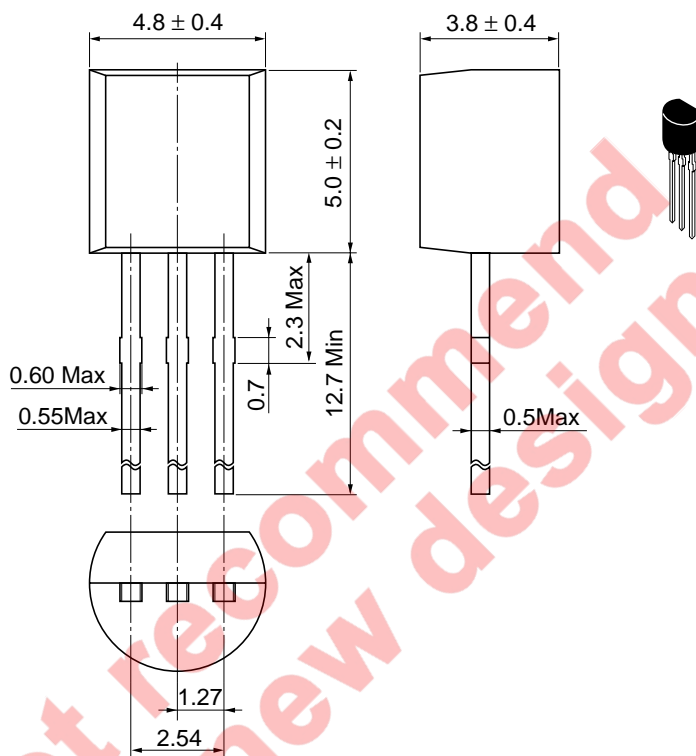


Not recommended for new design

## 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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