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

Cautions

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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2SA836

Silicon PNP Epitaxial

RENESAS

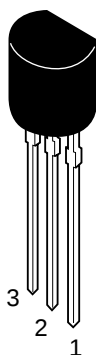
ADE-208-316 (Z)
1st. Edition
Mar. 2001

Application

Low frequency low noise amplifier

Outline

TO-92 (1)



- 1. Emitter
- 2. Collector
- 3. Base

Absolute Maximum Ratings (Ta = 25°C)

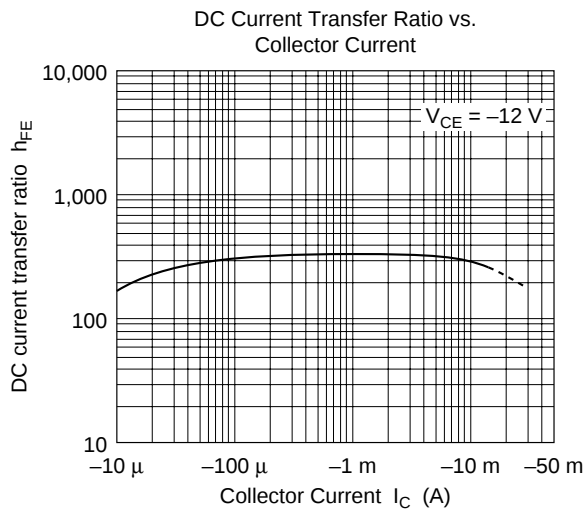
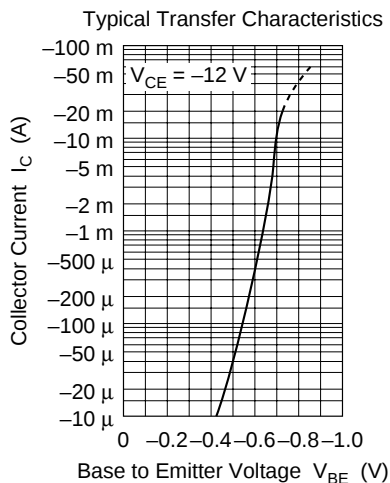
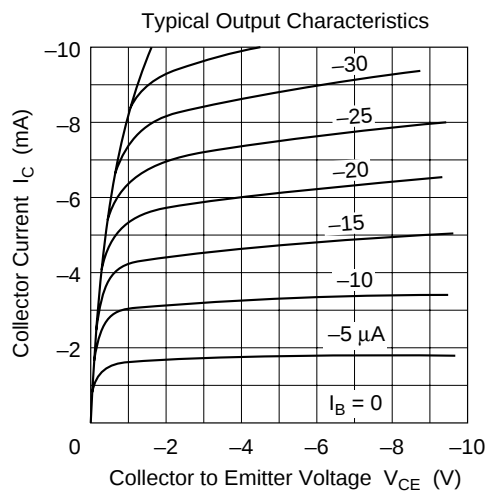
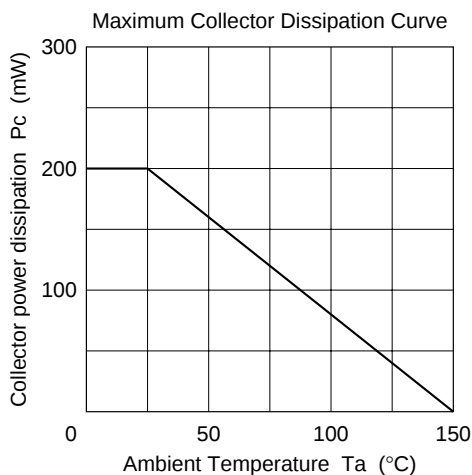
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	−55	V
Collector to emitter voltage	V_{CEO}	−55	V
Emitter to base voltage	V_{EBO}	−5	V
Collector current	I_C	−100	mA
Emitter current	I_E	100	mA
Collector power dissipation	P_C	200	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

Electrical Characteristics (Ta = 25°C)

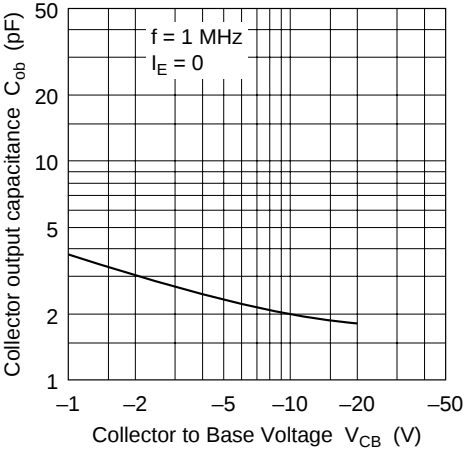
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	−55	—	—	V	$I_C = -10\text{ }\mu\text{A}$, $I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	−55	—	—	V	$I_C = -1\text{ mA}$, $R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	−5	—	—	V	$I_E = -10\text{ }\mu\text{A}$, $I_C = 0$
Collector cutoff current	I_{CBO}	—	—	−100	nA	$V_{CB} = -18\text{ V}$, $I_E = 0$
Emitter cutoff current	I_{EBO}	—	—	−50	nA	$V_{EB} = -2\text{ V}$, $I_C = 0$
DC current transfer ratio	h_{FE}^{*1}	160	—	500		$V_{CE} = -12\text{ V}$, $I_C = -2\text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	−0.1	−0.5	V	$I_C = -10\text{ mA}$, $I_B = -1\text{ mA}$
Base to emitter voltage	V_{BE}	—	−0.66	−0.75	V	$V_{CE} = -12\text{ V}$, $I_C = -2\text{ mA}$
Gain bandwidth product	f_T	—	200	—	MHz	$V_{CE} = -12\text{ V}$, $I_E = -2\text{ mA}$
Collector output capacitance	C_{ob}	—	2.0	—	pF	$V_{CB} = -10\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$
Noise figuer	NF	—	1	5	dB	$V_{CE} = -6\text{ V}$, $f = 10\text{ Hz}$
		—	0.5	1	dB	$I_C = -0.1\text{ mA}$, $f = 1\text{ kHz}$ $R_g = 10\text{ k}\Omega$

Note: 1. The 2SA836 is grouped by h_{FE} as follows.

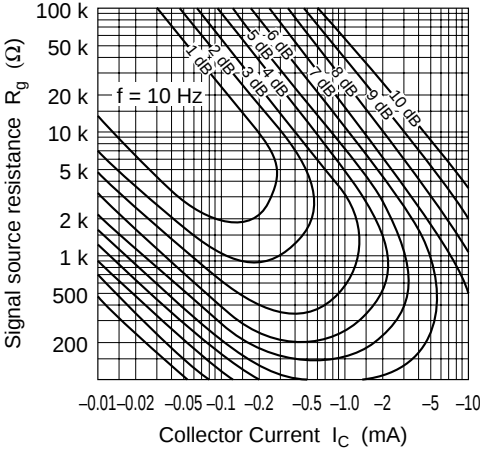
C	D
160 to 320	250 to 500



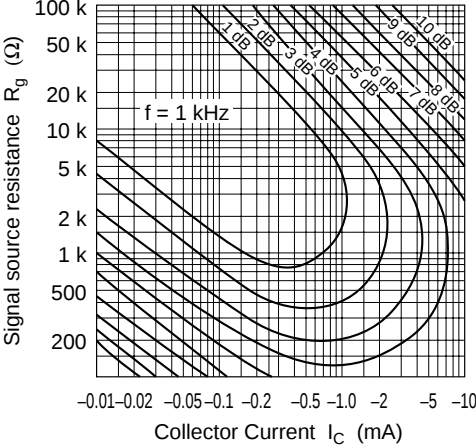
Collector Output Capacitance vs.
Collector to Base Voltage



Contours of Constant Noise Figure (1)



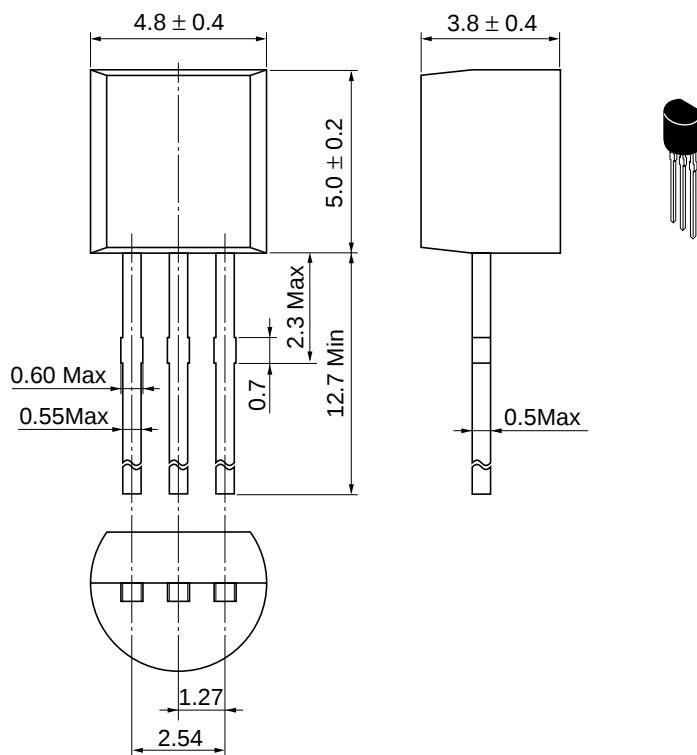
Contours of Constant Noise Figure (2)



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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