

To all our customers

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

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# 2SC458 (LG), 2SC2310

Silicon NPN Epitaxial

**RENESAS**

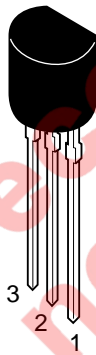
ADE-208-1044A (Z)  
2nd. Edition  
Mar. 2001

## Application

- Low frequency low noise amplifier

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

## 2SC458 (LG), 2SC2310

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

Item	Symbol	2SC458 (LG)	2SC2310	Unit
Collector to base voltage	V <sub>CBO</sub>	30	55	V
Collector to emitter voltage	V <sub>CEO</sub>	30	50	V
Emitter to base voltage	V <sub>EBO</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>	200	200	mW
Junction temperature	T <sub>j</sub>	150	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	-55 to +150	°C

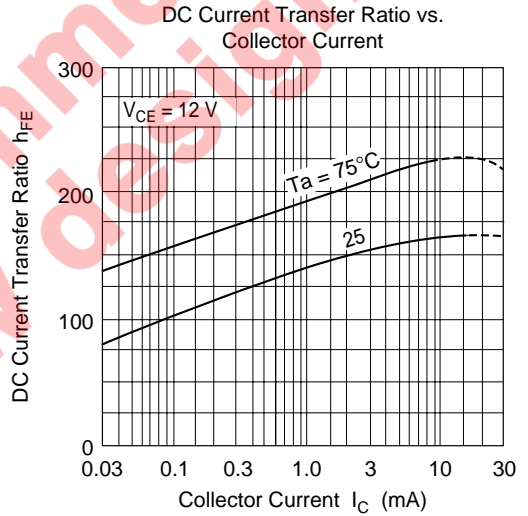
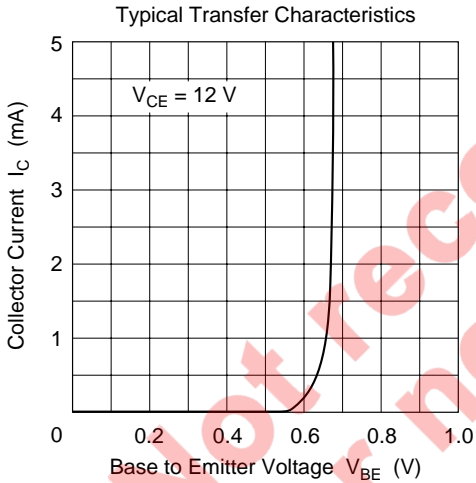
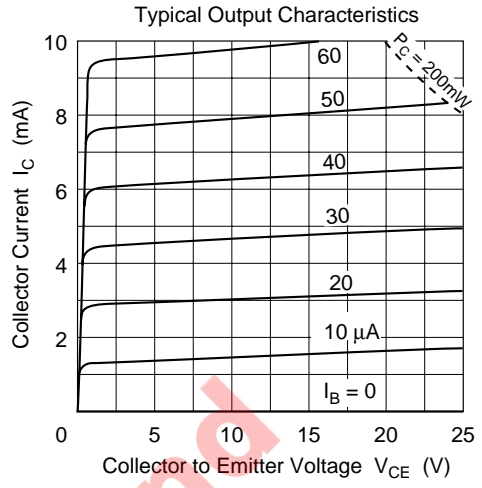
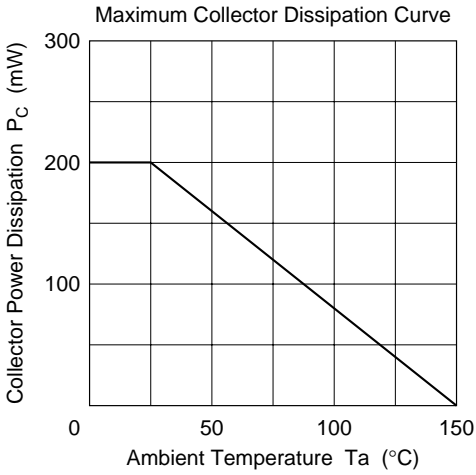
Not recommended  
for new design

## Electrical Characteristics (Ta = 25°C)

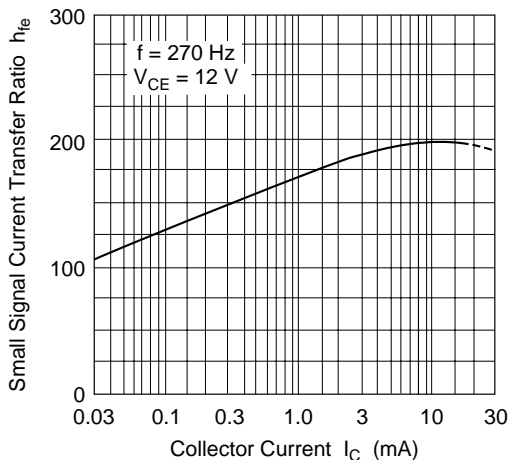
Item	Symbol	2SC458 (LG)			2SC2310			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	55	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	30	—	—	50	—	—	V	$I_C = 1 \text{ mA}, R_{BE} =$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	5	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.5	—	—	0.5	$\mu A$	$V_{CB} = 18 \text{ V}, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	0.5	—	—	0.5	$\mu A$	$V_{EB} = 2 \text{ V}, I_C = 0$
DC current transfer ratio	$h_{FE}^{*1}$	100	—	500	100	—	320		$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
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	$V_{BE}$	—	0.67	0.75	—	0.67	0.75	V	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Gain bandwidth product	$f_T$	—	230	—	—	230	—	MHz	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector output capacitance	Cob	—	1.8	3.5	—	1.8	3.5	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Noise figure	NF	—	3	5	—	3	5	dB	$V_{CE} = 6 \text{ V}, I_C = 0.1 \text{ mA}, f = 120 \text{ Hz}, R_g = 500 \Omega$
Small signal input impedance	$h_{ie}$	—	16.5	—	—	16.5	—	k $\Omega$	$V_{CE} = 5 \text{ V}, I_C = 0.1 \text{ mA}, f = 270 \text{ Hz}$
Small signal voltage feedback ratio	$h_{re}$	—	70	—	—	70	—	$\times 10^{-6}$	
Small signal current transfer ratio	$h_{fe}$	—	130	—	—	130	—		
Small signal output admittance	$h_{oe}$	—	11.0	—	—	11.0	—	$\mu S$	

Note: 1. The 2SC458 (LG) and 2SC2310 are grouped by  $h_{FE}$  as follows.

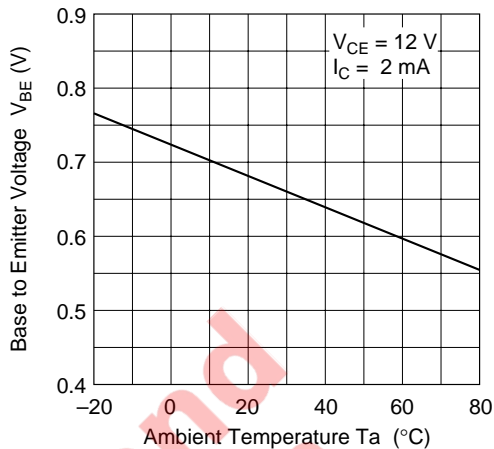
	B	C	D
2SC458 (LG)	100 to 200	160 to 320	250 to 500
2SC2310	100 to 200	160 to 320	—



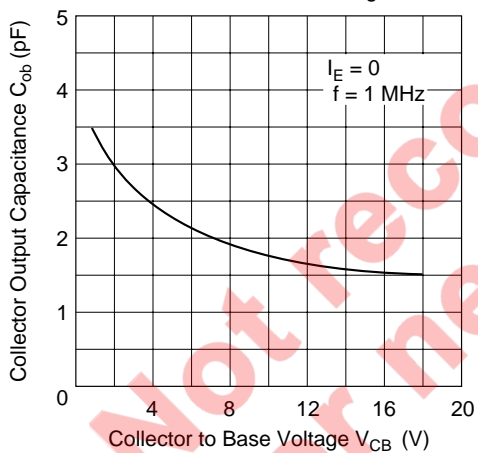
Small Signal Current Transfer Ratio vs. Collector Current



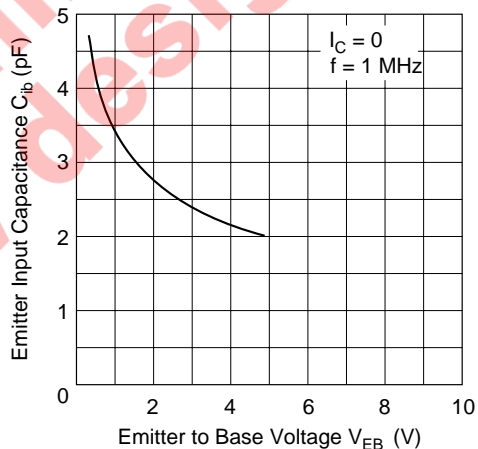
Base to Emitter Voltage vs. Ambient Temperature

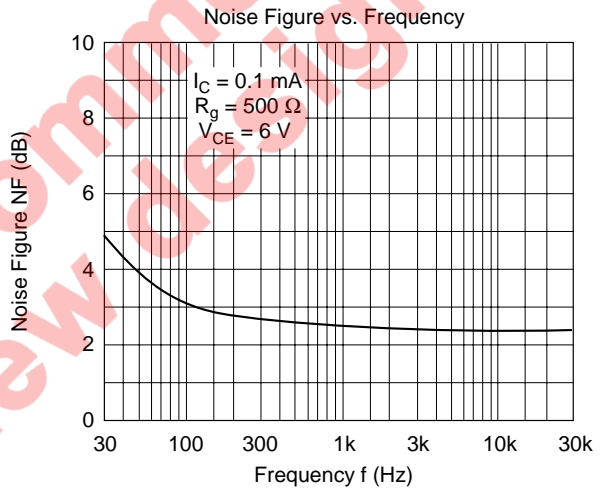
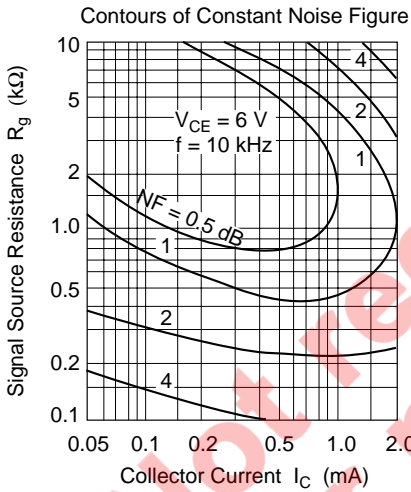
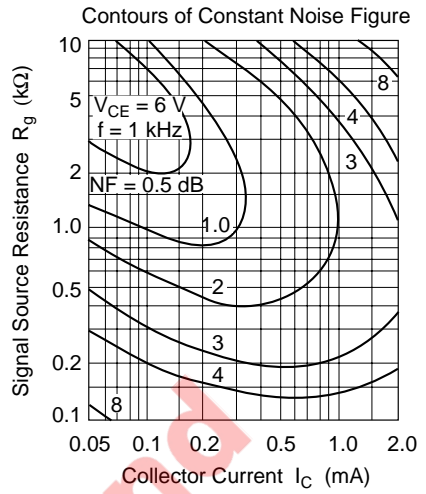
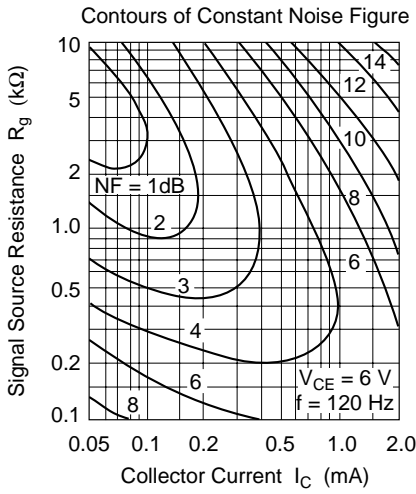


Collector Output Capacitance vs. Collector to Base Voltage



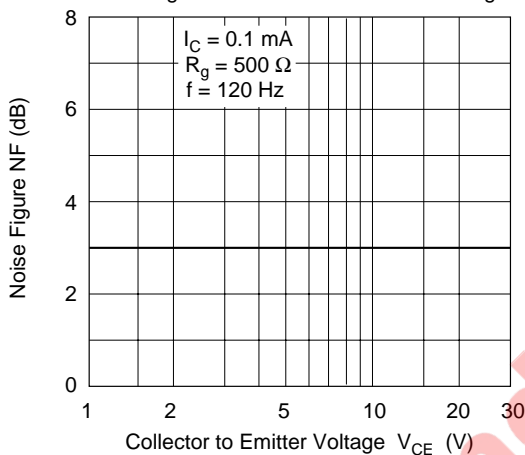
Emitter Input Capacitance vs. Emitter to Base Voltage



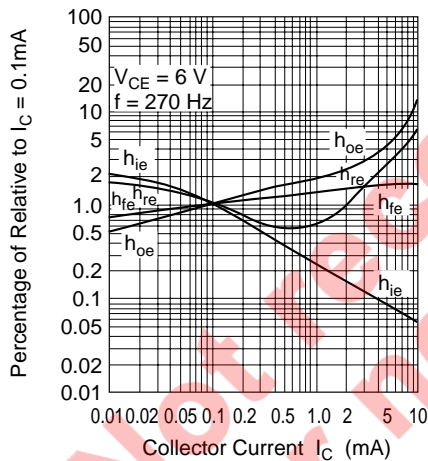




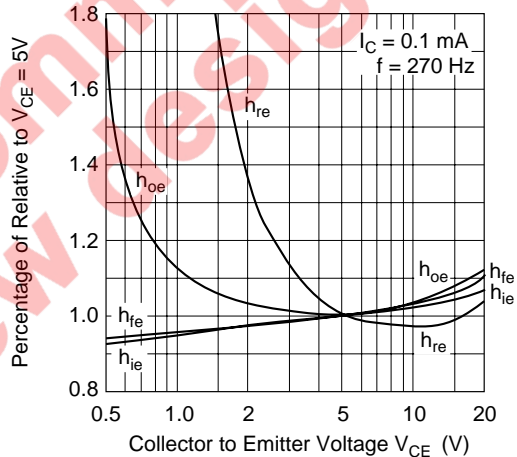
Noise Figure vs. Collector to Emitter Voltage



h Parameter vs. Collector Current



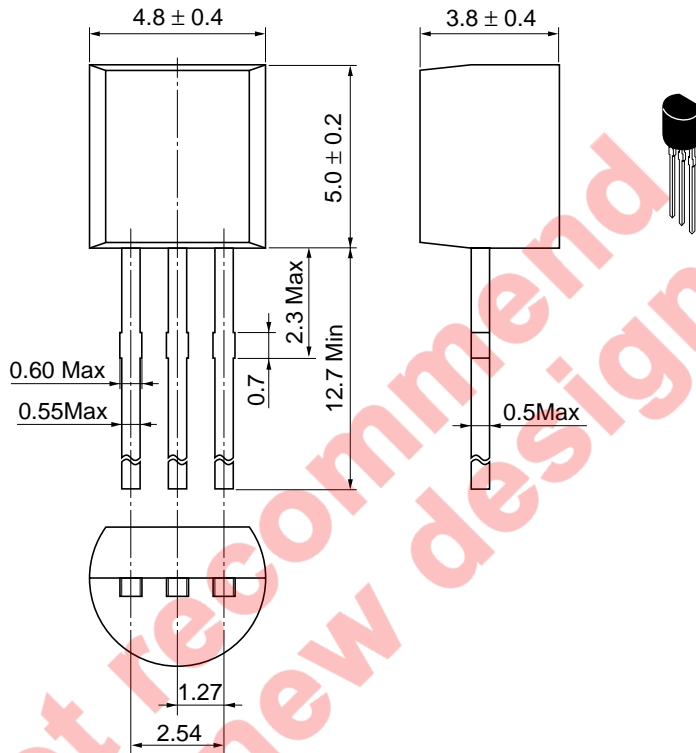
h Parameter vs. Collector to Emitter Voltage



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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