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

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2SC458 (LG), 2SC2310

Silicon NPN Epitaxial

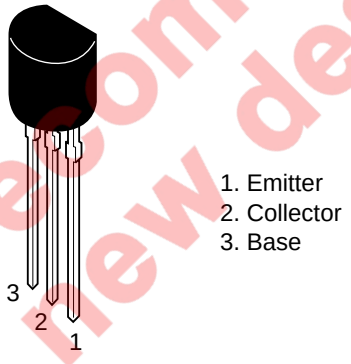
ADE-208-1044A (Z)
2nd. Edition
Mar. 2001

Application

- Low frequency low noise amplifier

Outline

TO-92 (1)



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	2SC458 (LG)	2SC2310	Unit
Collector to base voltage	V_{CBO}	30	55	V
Collector to emitter voltage	V_{CEO}	30	50	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	200	200	mW
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

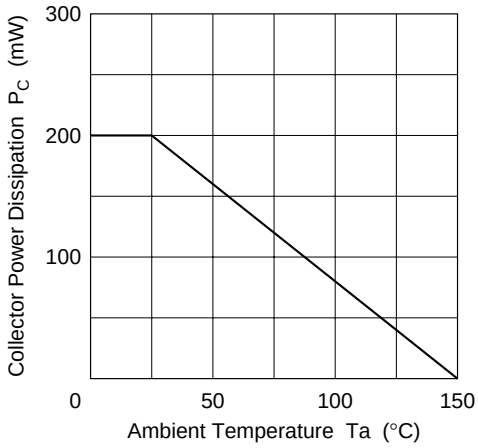
Electrical Characteristics (Ta = 25°C)

Item	Symbol	2SC458 (LG) Min	2SC458 (LG) Typ	2SC458 (LG) Max	2SC2310 Min	2SC2310 Typ	2SC2310 Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	55	—	—	V	I_C = 10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	30	—	—	50	—	—	V	I_C = 1 mA, R_{BE} =
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	5	—	—	V	I_E = 10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	0.5	—	—	0.5	µA	V_{CB} =18 V, I_E = 0
Emitter cutoff current	I_{EBO}	—	—	0.5	—	—	0.5	µA	V_{EB} = 2 V, I_C = 0
DC current transfer ratio	h_{FE}[*1]	100	—	500	100	—	320		V_{CE} = 12 V, I_C = 2 mA
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.2	—	—	0.2	V	I_C = 10 mA, I_B = 1 mA
Base to emitter voltage	V_{BE}	—	0.67	0.75	—	0.67	0.75	V	V_{CE} = 12 V, I_C = 2 mA
Gain bandwidth product	f_T	—	230	—	—	230	—	MHz	V_{CE} = 12 V, I_C = 2 mA
Collector output capacitance	Cob	—	1.8	3.5	—	1.8	3.5	pF	V_{CB} = 10 V, I_E = 0, f = 1 MHz
Noise figure	NF	—	3	5	—	3	5	dB	V_{CE} = 6 V, I_C = 0.1 mA, f = 120 Hz, R_g = 500 Ω
Small signal input impedance	h_{ie}	—	16.5	—	—	16.5	—	kΩ	V_{CE} = 5V, I_C = 0.1mA, f = 270 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	—	µS	

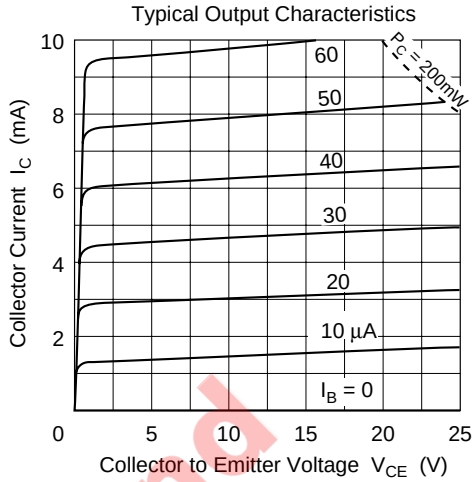
Note: 1. The 2SC458 (LG) and 2SC2310 are grouped by h_{FE} as follows.

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

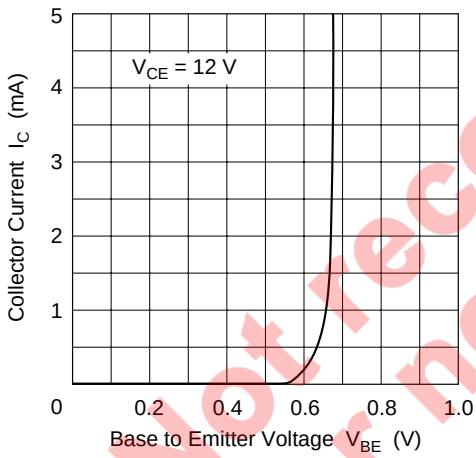
Maximum Collector Dissipation Curve



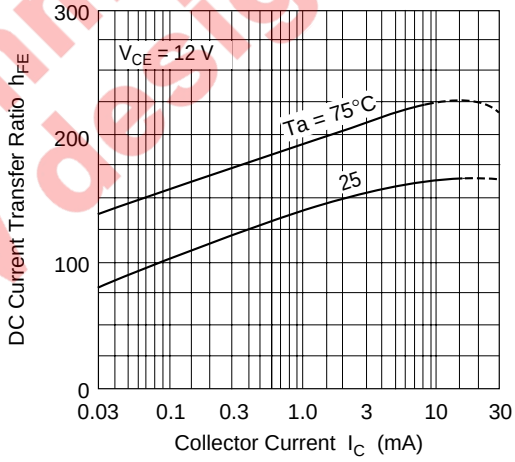
Typical Output Characteristics



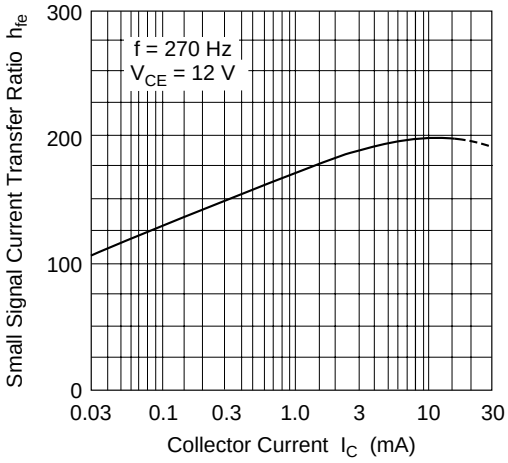
Typical Transfer Characteristics



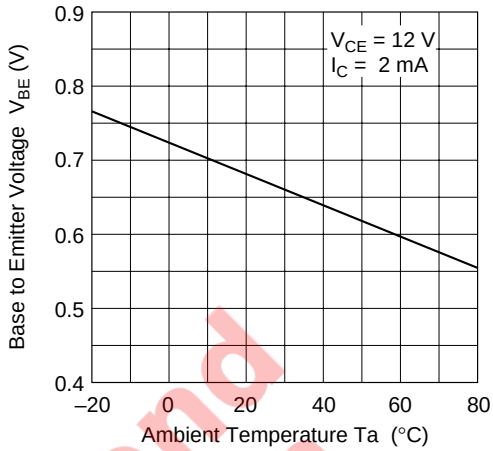
DC Current Transfer Ratio vs. Collector Current



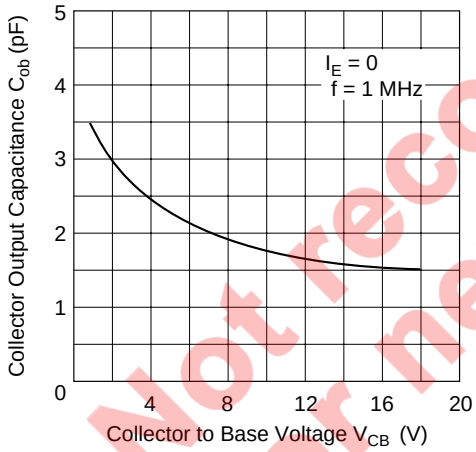
Small Signal Current Transfer Ratio vs. Collector Current



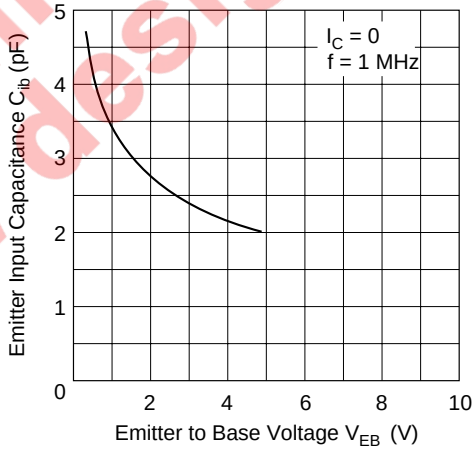
Base to Emitter Voltage vs. Ambient Temperature



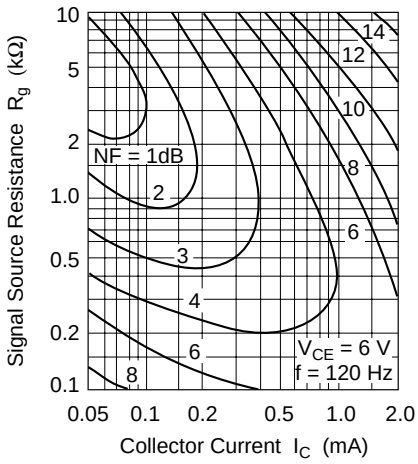
Collector Output Capacitance vs. Collector to Base Voltage



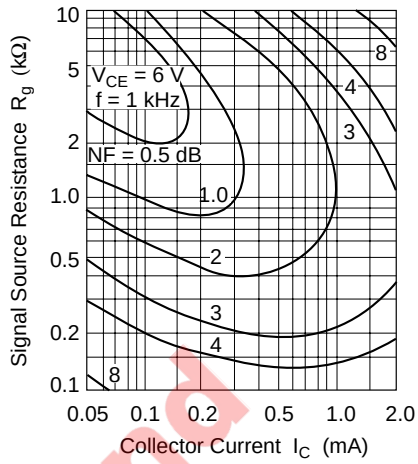
Emitter Input Capacitance vs. Emitter to Base Voltage



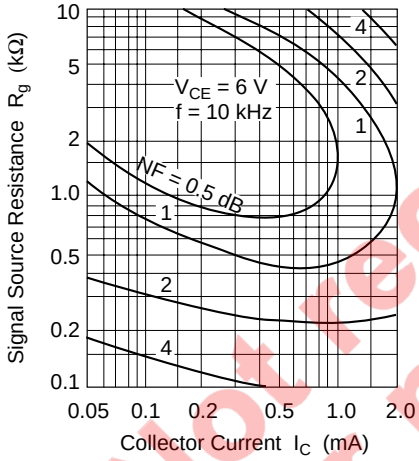
Contours of Constant Noise Figure



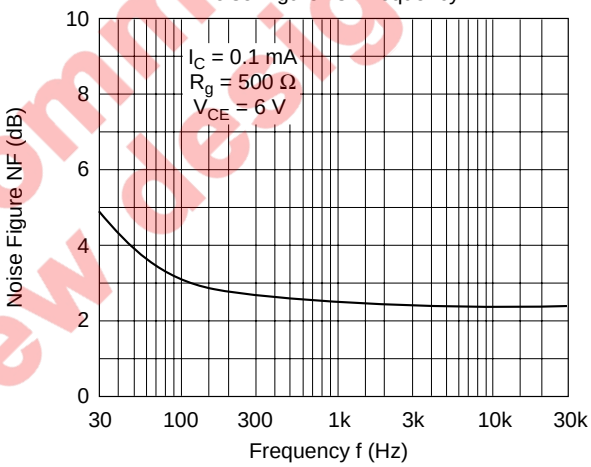
Contours of Constant Noise Figure

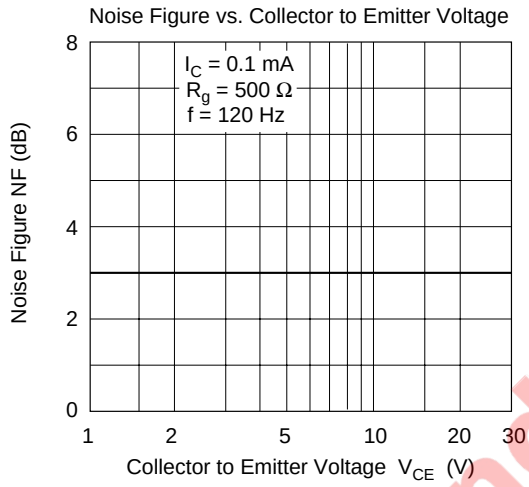


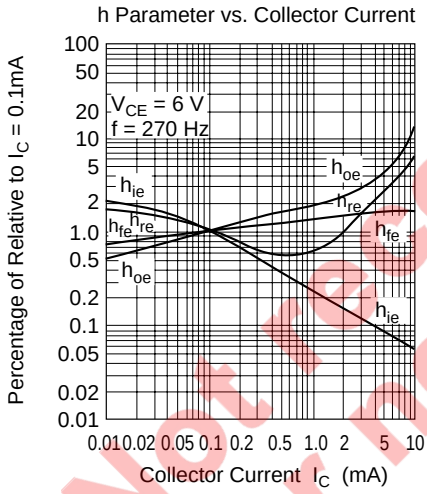
Contours of Constant Noise Figure

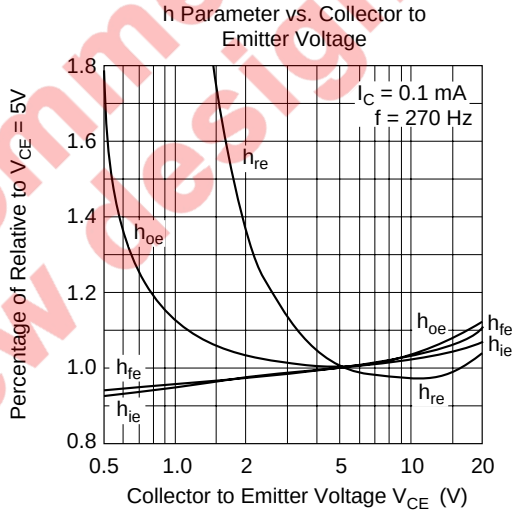


Noise Figure vs. Frequency





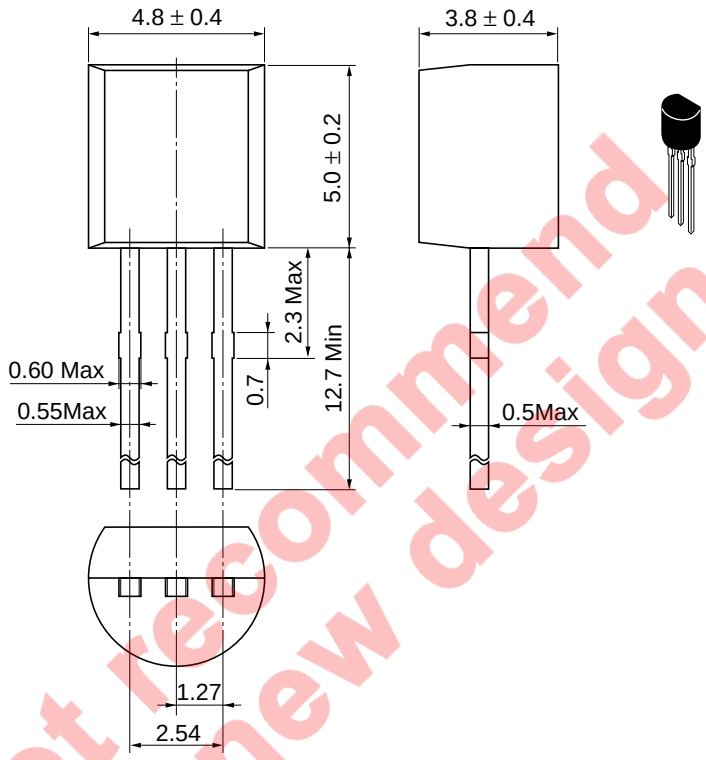




Package Dimensions

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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