

# 2SC2309

Silicon NPN Epitaxial

REJ03G0696-0200  
(Previous ADE-208-1061)  
Rev.2.00  
Aug.10.2005

## Application

Low frequency amplifier

## Outline

RENESAS Package code: PRSS0003DA-A  
(Package name: 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	$V_{CEO}$	50	V
Emitter to base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	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

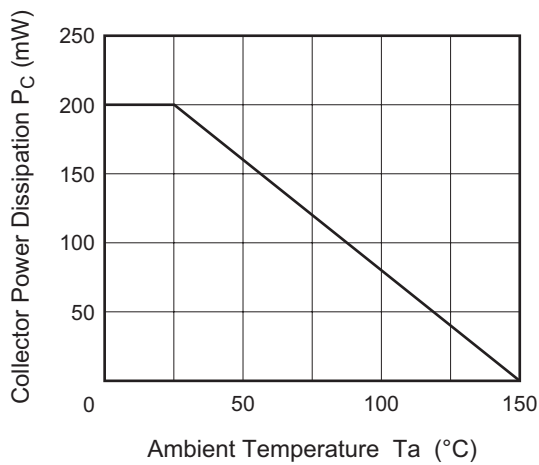
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	55	—	—	V	$I_C = 10\ \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	50	—	—	V	$I_C = 1\ mA, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 10\ \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.5	$\mu A$	$V_{CB} = 18\ V, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	0.5	$\mu A$	$V_{EB} = 2\ V, I_C = 0$
DC current transfer ratio	$h_{FE}$	250	—	500		$V_{CE} = 12\ V, I_C = 2\ mA$
Base to emitter voltage	$V_{BE}$	—	—	0.75	V	$V_{CE} = 12\ V, I_C = 2\ mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.2	V	$I_C = 10\ mA, I_B = 1\ mA$
Gain bandwidth product	$f_T$	—	230	—	MHz	$V_{CE} = 12\ V, I_C = 2\ mA$
Collector output capacitance	$C_{ob}$	—	1.8	3.5	pF	$V_{CB} = 10\ V, I_E = 0, f = 1\ MHz$

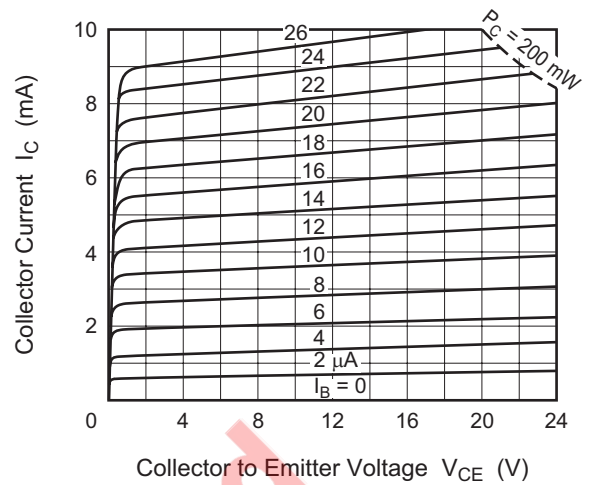
Not recommend  
for new design

## Main Characteristics

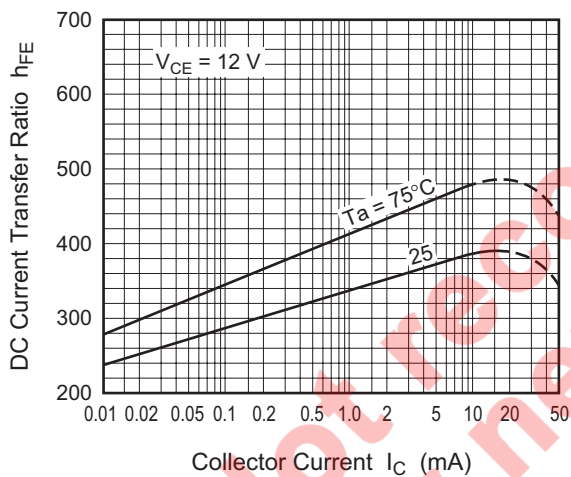
Maximum Collector Dissipation Curve



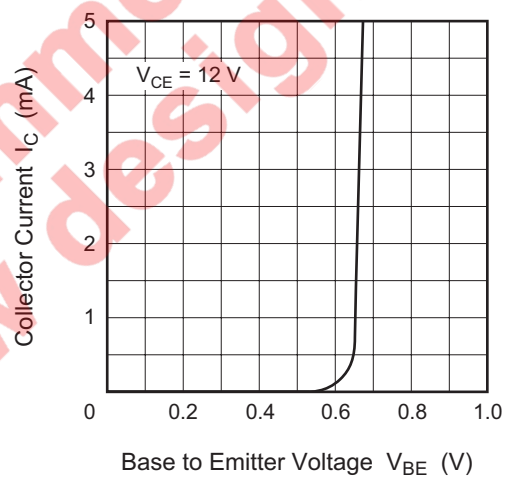
Typical Output Characteristics



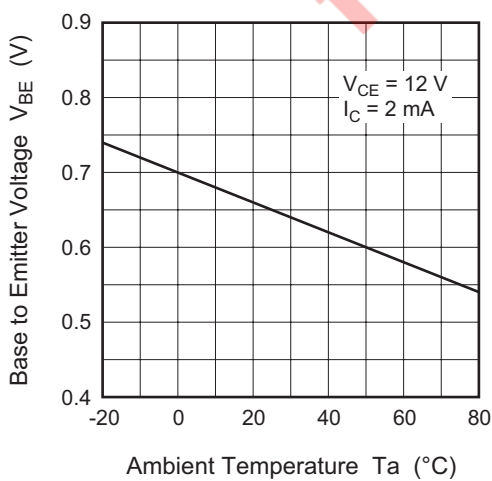
DC Current Transfer Ratio vs. Collector Current



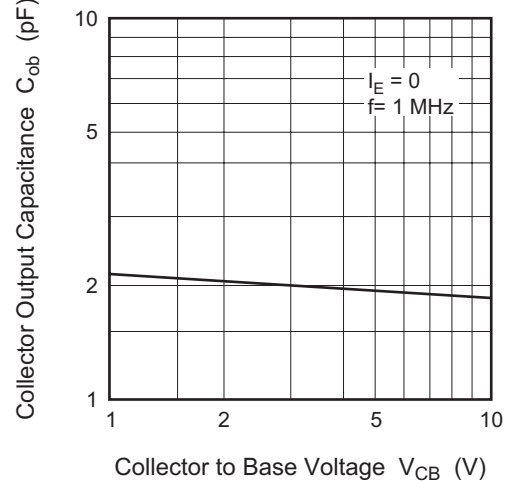
Typical Transfer Characteristics

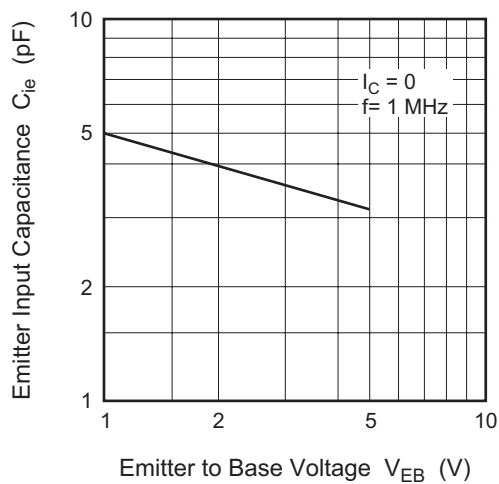


Base to Emitter Voltage vs. Ambient Temperature

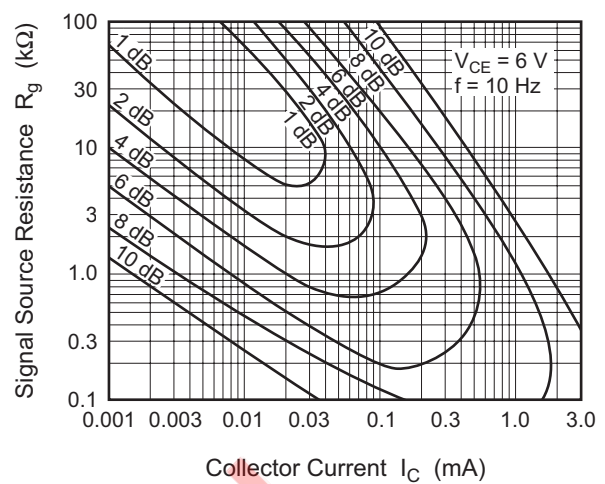


Collector Output Capacitance vs. Collector to Base Voltage

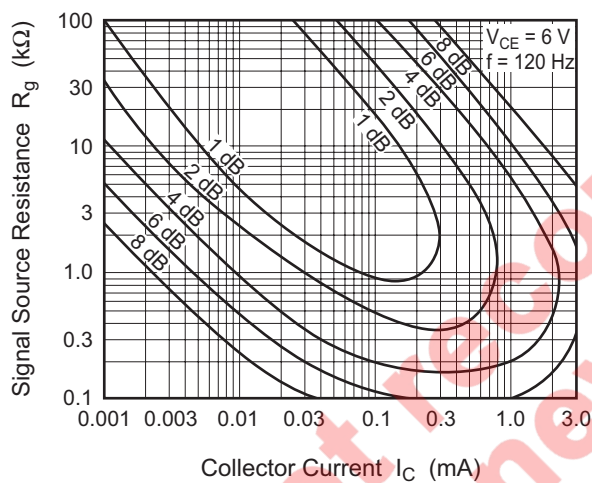


Emitter Input Capacitance vs.  
Emitter to Base Voltage

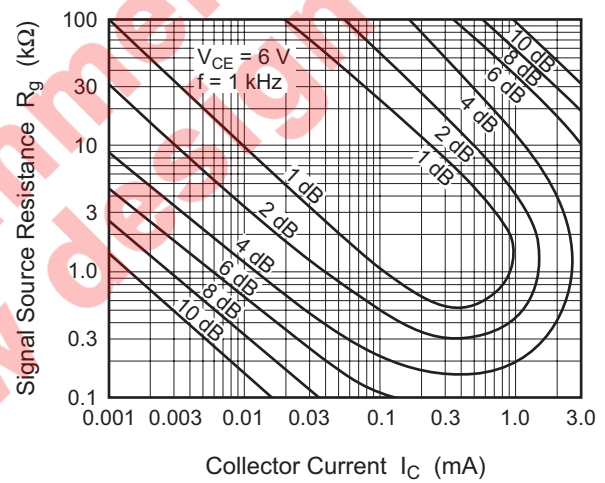
Contours of Constant Noise Figure



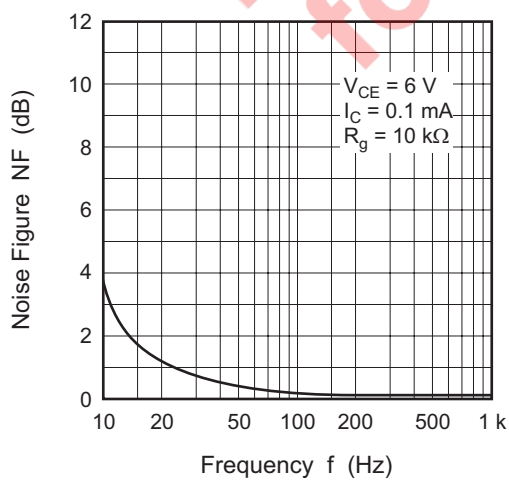
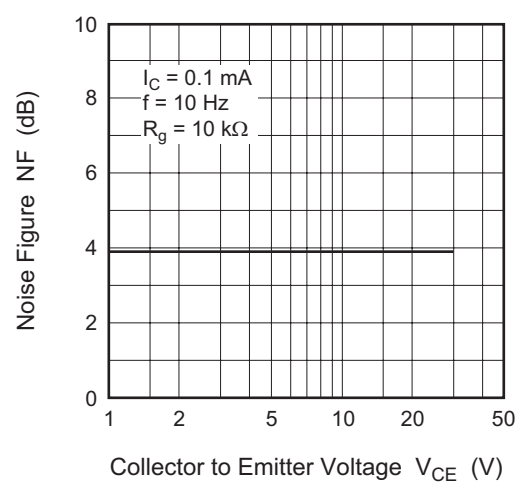
Contours of Constant Noise Figure

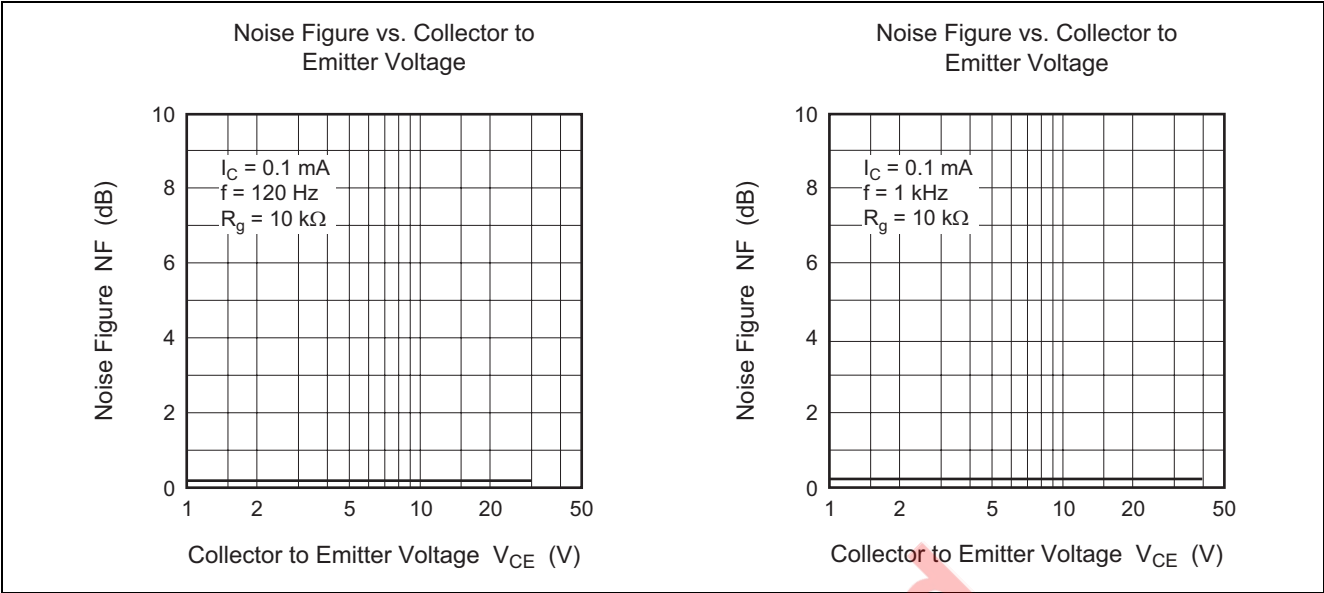


Contours of Constant Noise Figure



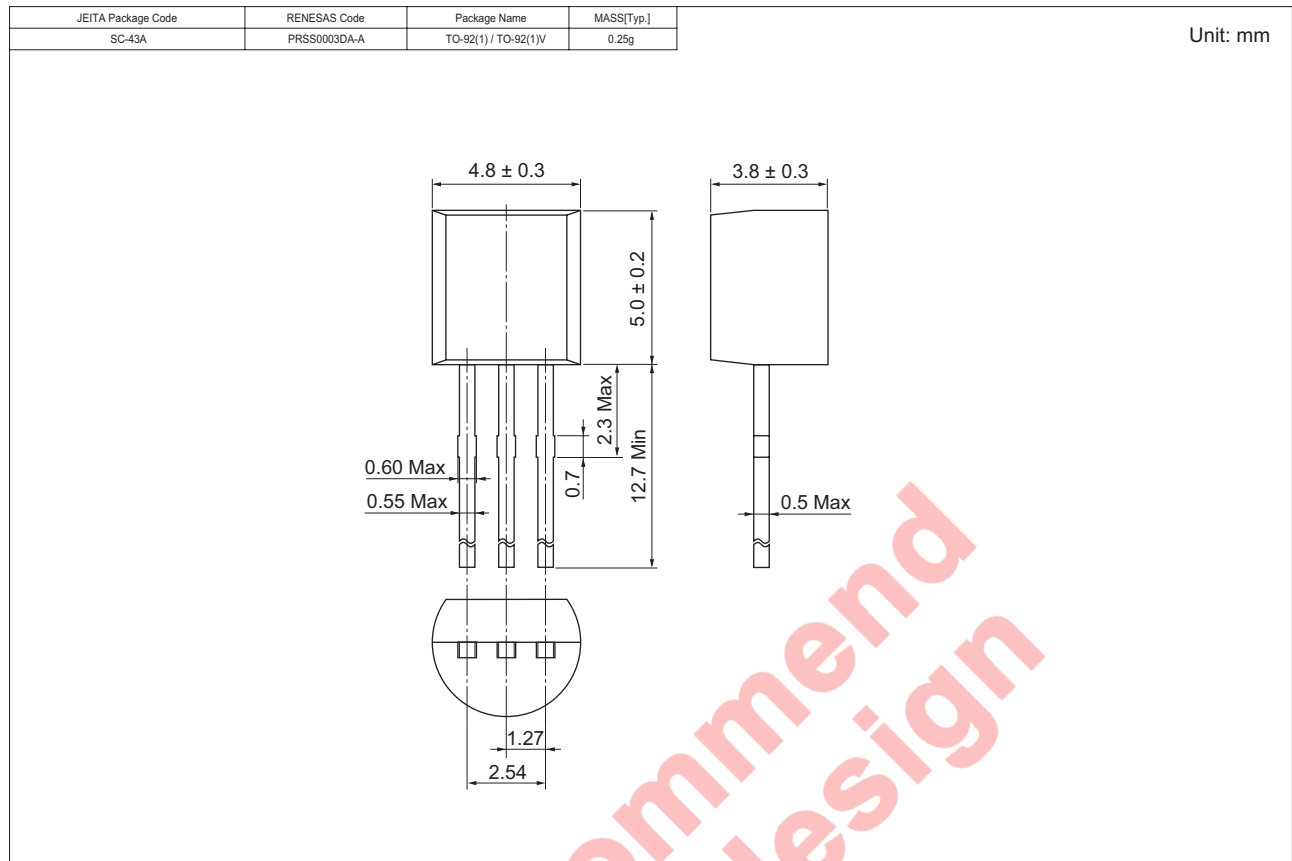
Noise Figure vs. Frequency

Noise Figure vs. Collector to  
Emitter Voltage



Not recommended  
for new design

## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
2SC2309DTZ-E	2500	Hold Box, Radial Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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