

# 2SC1345

Silicon NPN Epitaxial

REJ03G0687-0300  
(Previous ADE-208-1052A)  
Rev.3.00  
Sep.10.2005

## Application

Low frequency low noise 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	$h_{FE}^{*1}$	250	—	1200		$V_{CE} = 12\ V, I_C = 2\ mA$
Base to emitter voltage	$V_{BE}$	—	—	0.75	V	$V_{CE} = 12\ V, I_C = 2\ mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.5	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	$C_{ob}$	—	—	3.5	pF	$V_{CB} = 10\ V, I_E = 0, f = 1\ MHz$
Noise figure	NF	—	—	8	dB	$V_{CE} = 6\ V, I_C = 0.1\ mA, f = 10\ Hz, R_g = 10\ k\Omega$
		—	—	1	dB	$V_{CE} = 6\ V, I_C = 0.1\ mA, f = 1\ kHz, R_g = 10\ k\Omega$

Note: 1. The 2SC1345 is grouped by  $h_{FE}$  as follows.

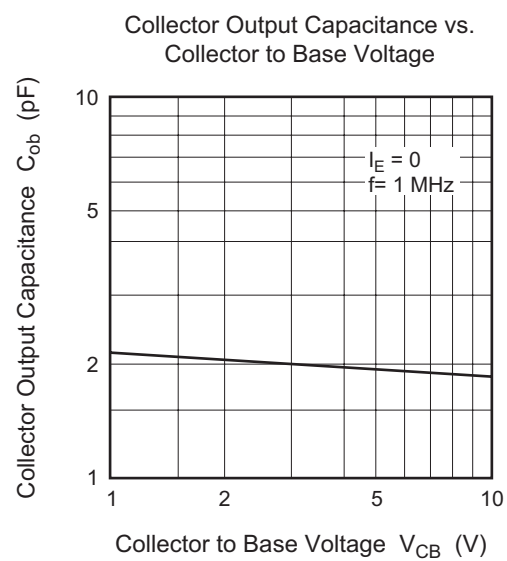
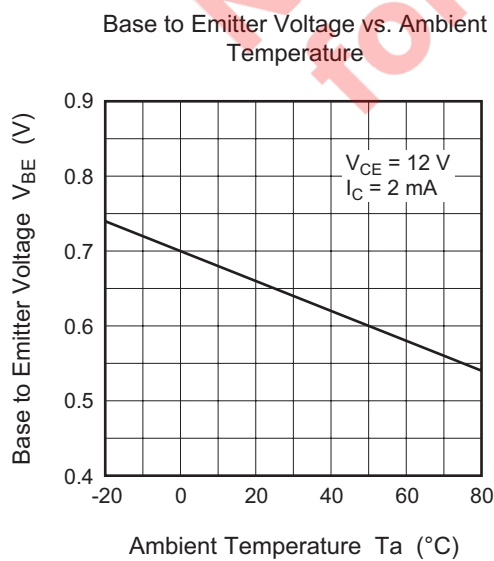
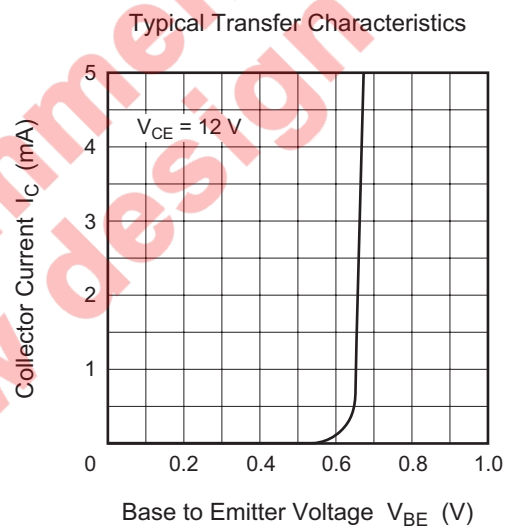
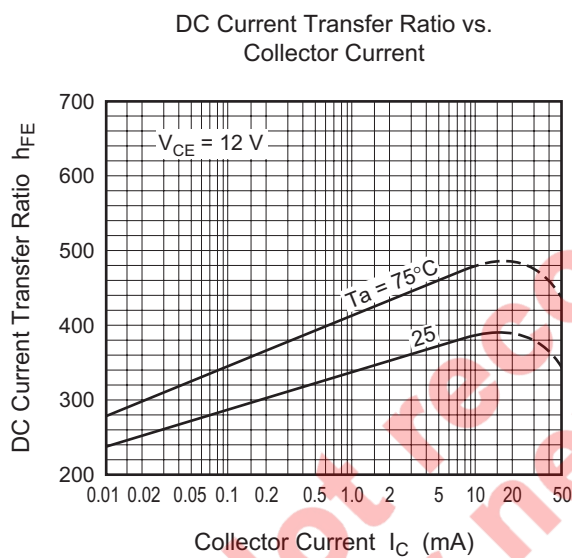
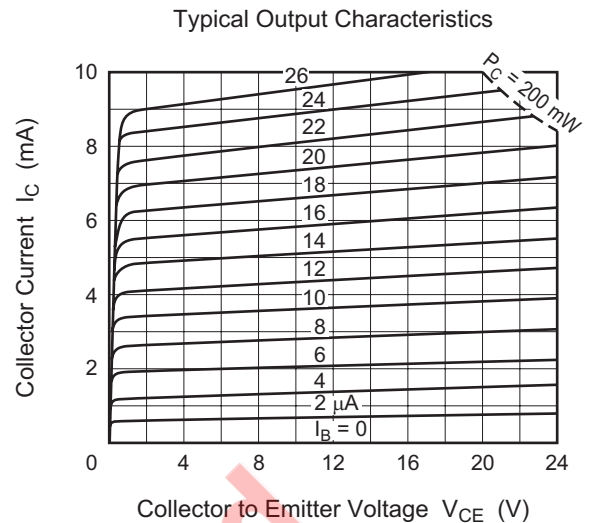
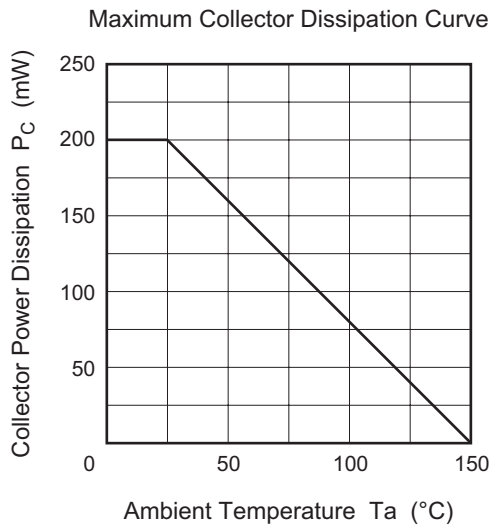
D	E	F
250 to 500	400 to 800	600 to 1200

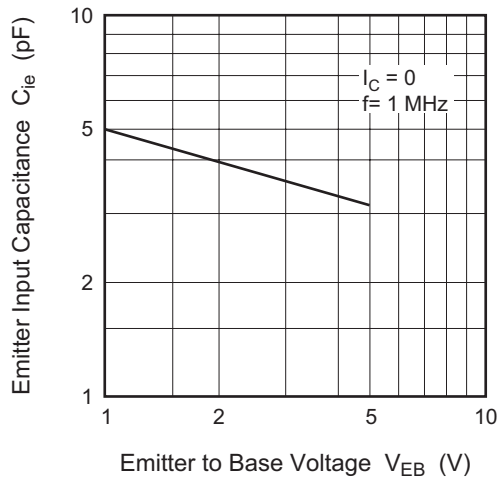
## Small Signal h Parameters

(V<sub>CE</sub> = 5V, I<sub>C</sub> = 0.1 mA, f = 270 Hz, Ta = 25°C, Emitter common)

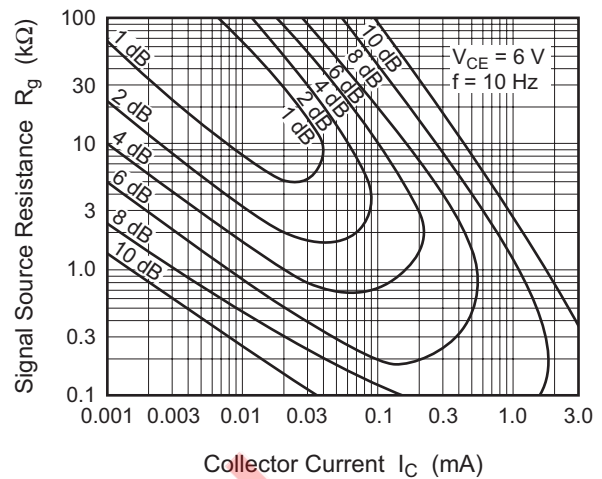
Item	Symbol	D	E	F	Unit
Input impedance	$h_{ie}$	110	170	240	k $\Omega$
Voltage feedback ratio	$h_{re}$	9.5	14.5	16	$\times 10^{-4}$
Current transfer ratio	$h_{fe}$	340	540	825	
Output admittance	$h_{oe}$	12.0	12.5	13.5	$\mu S$

## Main Characteristics

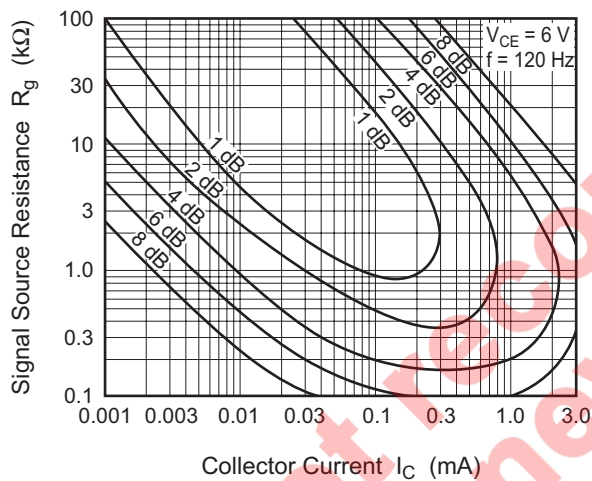


Emitter Input Capacitance vs.  
Emitter to Base Voltage

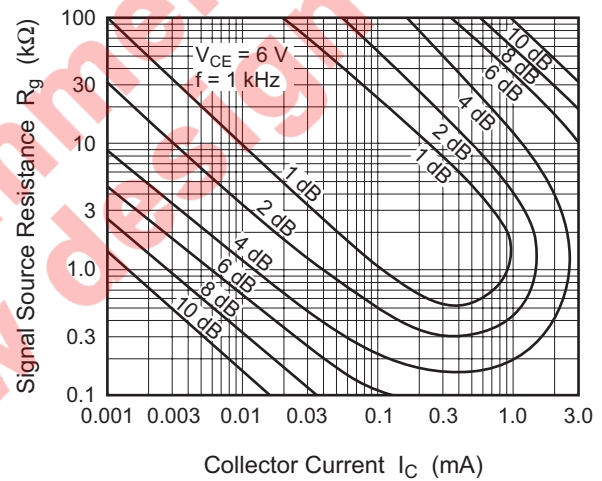
Contours of Constant Noise Figure



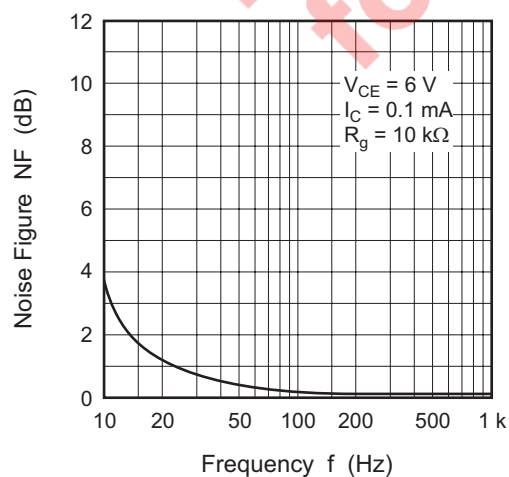
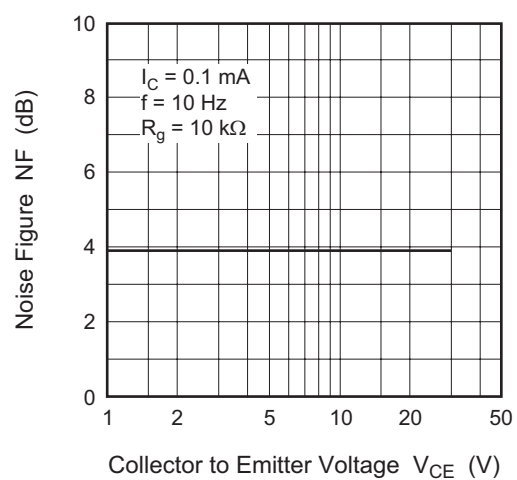
Contours of Constant Noise Figure

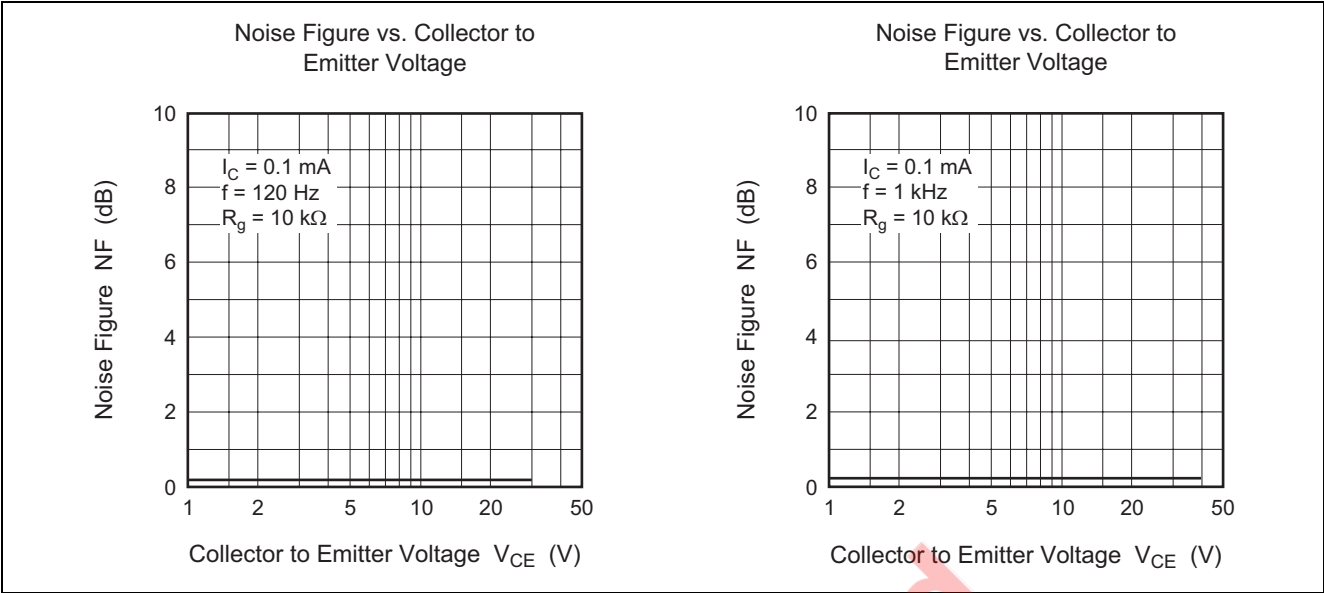


Contours of Constant Noise Figure



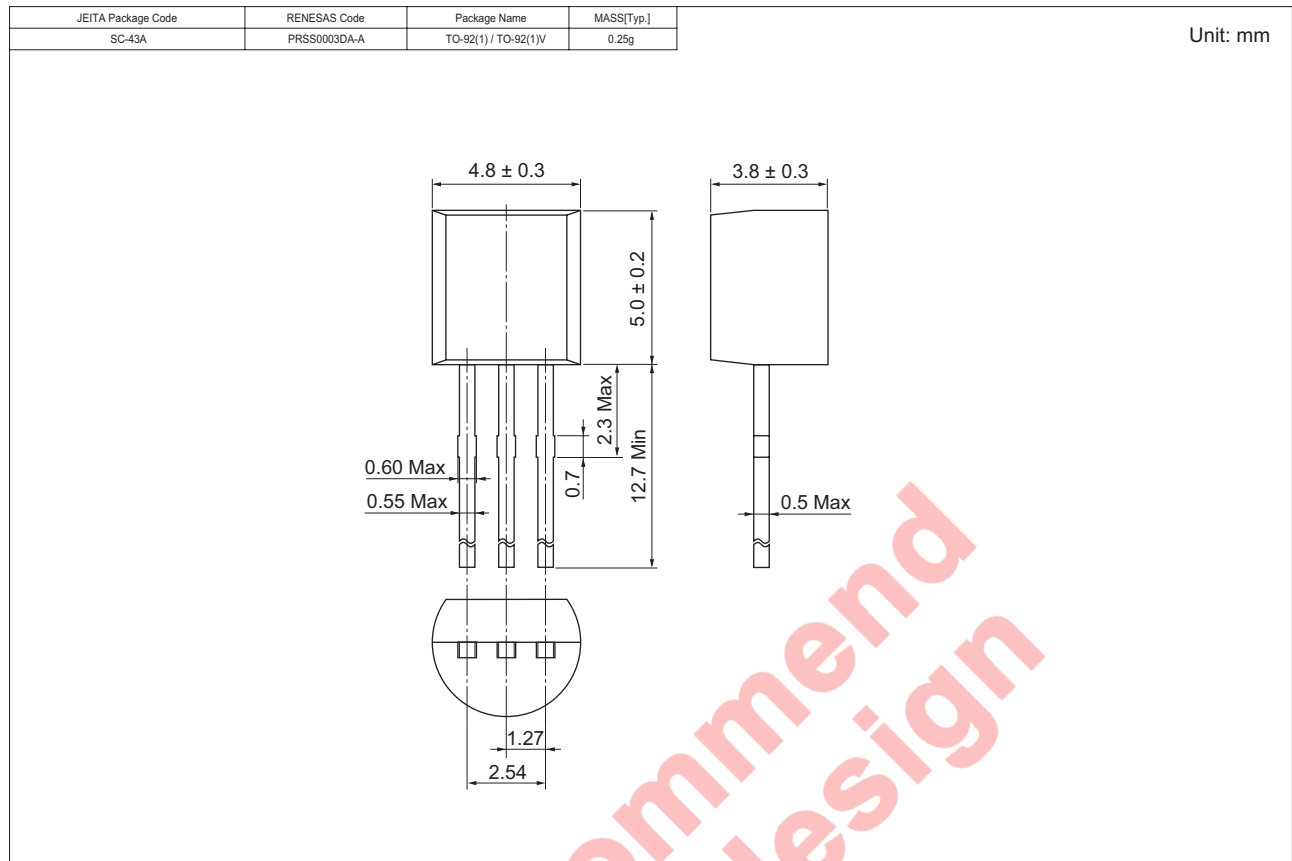
Noise Figure vs. Frequency

Noise Figure vs. Collector to  
Emitter Voltage



Not recommended  
for new design

## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
2SC1345ETZ-E	2500	Hold Box, Radial Taping
2SC1345FTZ-E		

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