

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	$I_C = 1 \text{ mA}, R_{BE} = \infty$
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	μA	$V_{CB} = 18 \text{ V}, I_E = 0$
Emitter cutoff current	I_{EBO}	—	—	0.5	μA	$V_{EB} = 2 \text{ V}, I_C = 0$
DC current transfer ratio	h_{FE}^{*1}	250	—	1200		$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Base to emitter voltage	V_{BE}	—	—	0.75	V	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.5	V	$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$
Gain bandwidth product	f_T	—	230	—	MHz	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector output capacitance	C_{ob}	—	—	3.5	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Noise figure	NF	—	—	8	dB	$V_{CE} = 6 \text{ V}, I_C = 0.1 \text{ mA}, f = 10 \text{ Hz}, R_g = 10 \text{ k}\Omega$
		—	—	1	dB	$V_{CE} = 6 \text{ V}, I_C = 0.1 \text{ mA}, f = 1 \text{ kHz}, R_g = 10 \text{ k}\Omega$

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

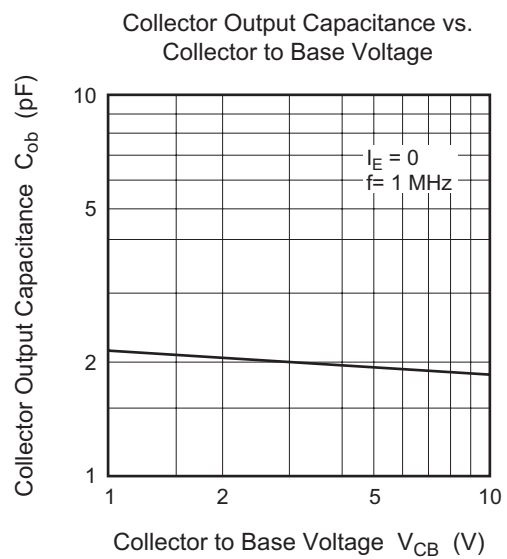
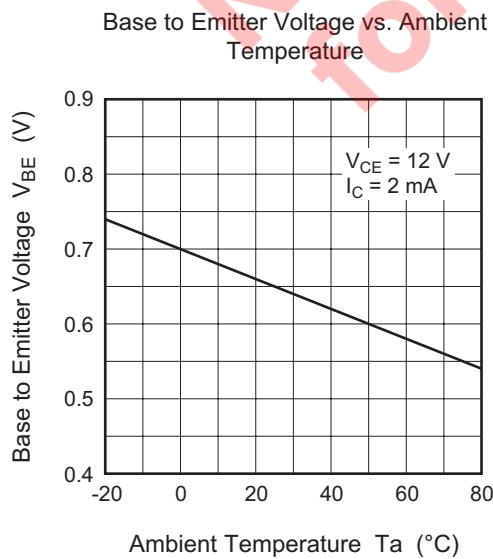
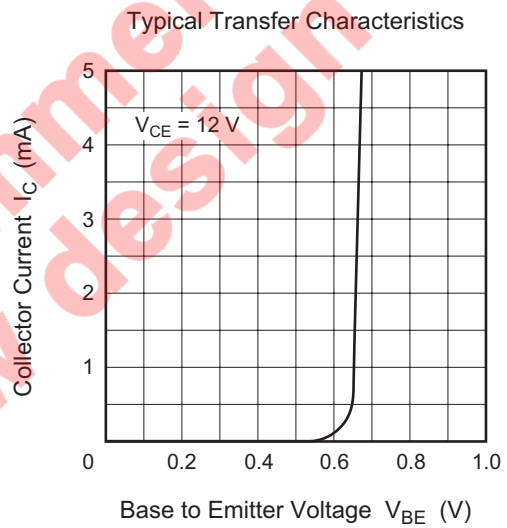
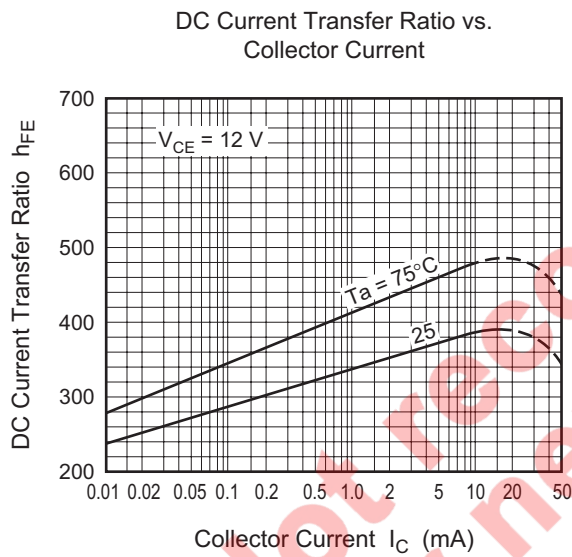
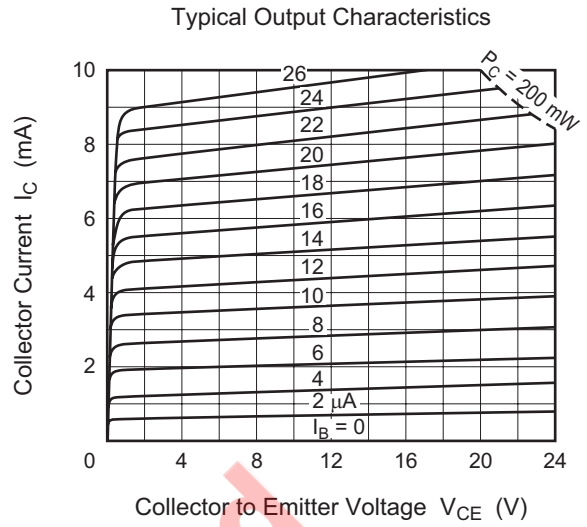
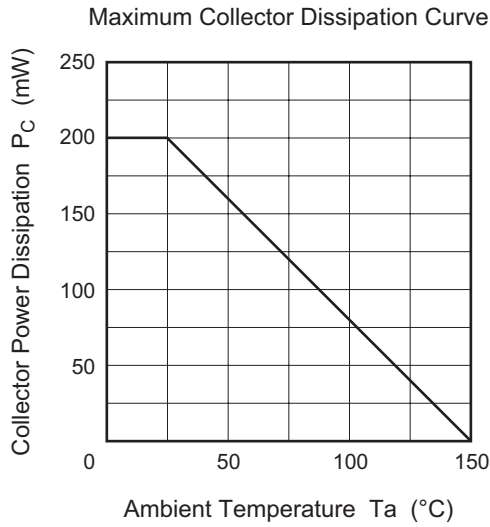
D	E	F
250 to 500	400 to 800	600 to 1200

Small Signal h Parameters

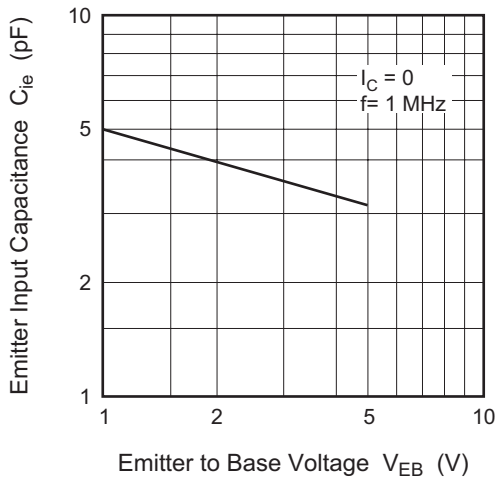
(V_{CE} = 5V, I_C = 0.1 mA, f = 270 Hz, Ta = 25°C, Emitter common)

Item	Symbol	D	E	F	Unit
Input impedance	h_{ie}	110	170	240	k Ω
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	μS

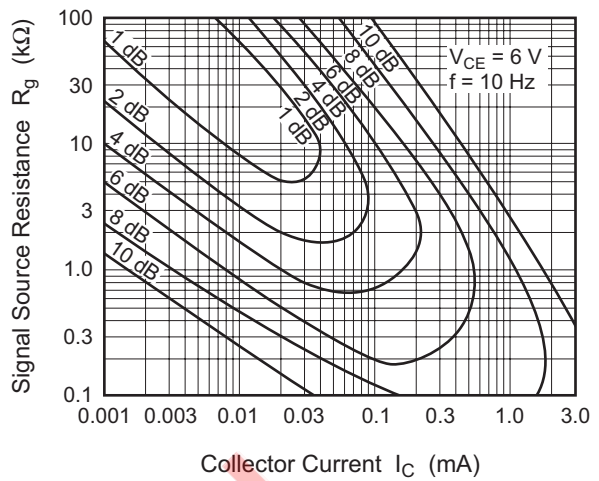
Main Characteristics



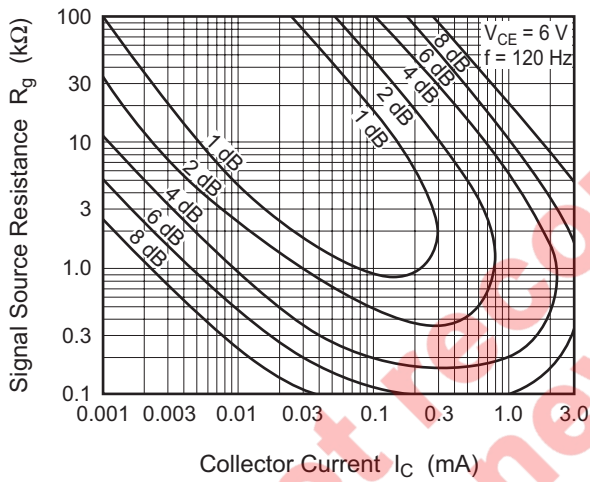
Emitter Input Capacitance vs. Emitter to Base Voltage



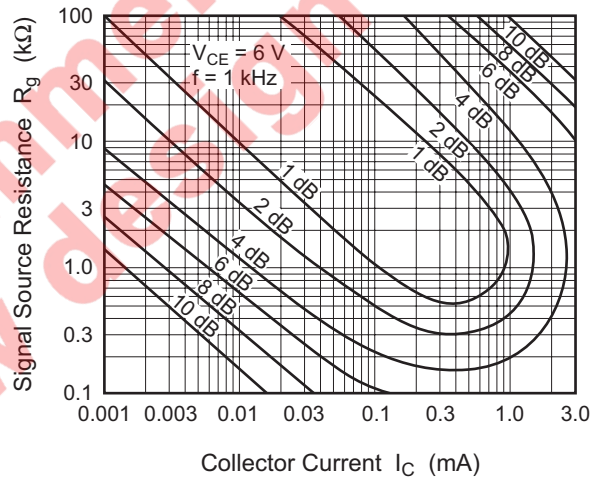
Contours of Constant Noise Figure



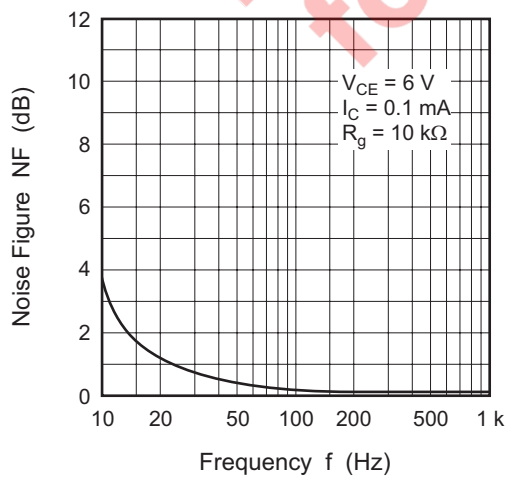
Contours of Constant Noise Figure



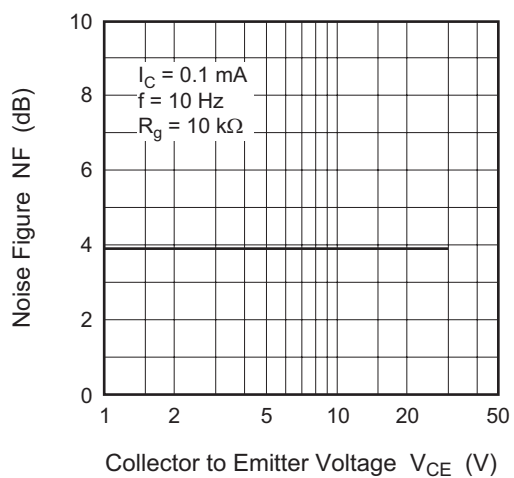
Contours of Constant Noise Figure

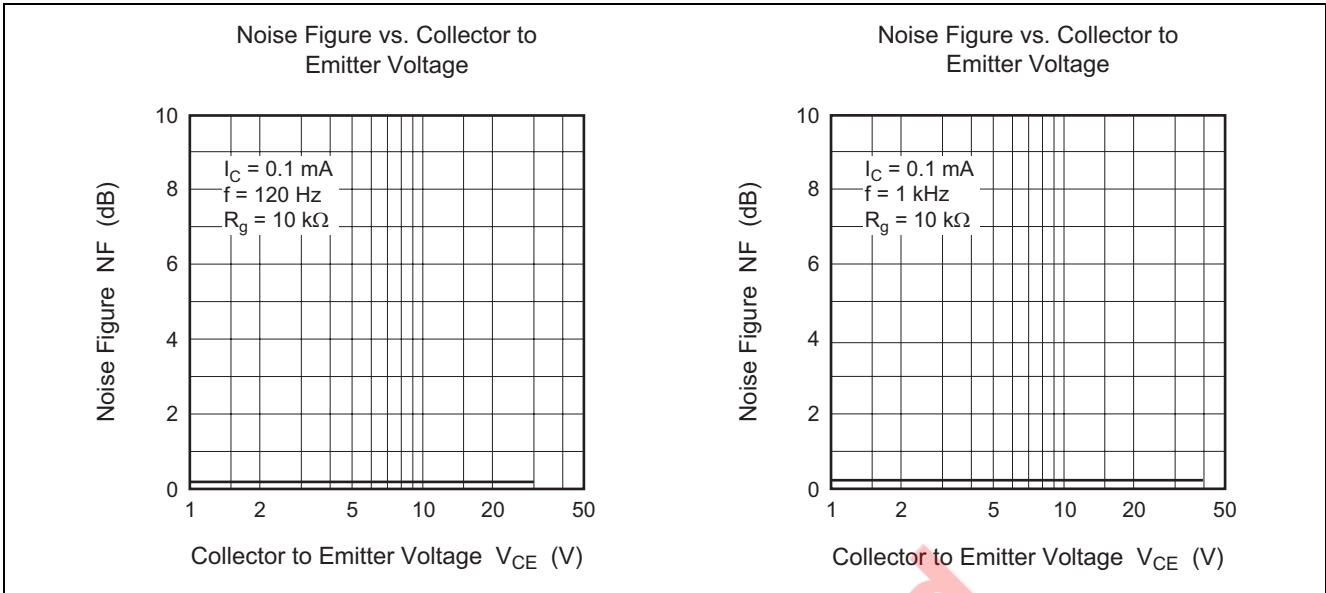


Noise Figure vs. Frequency



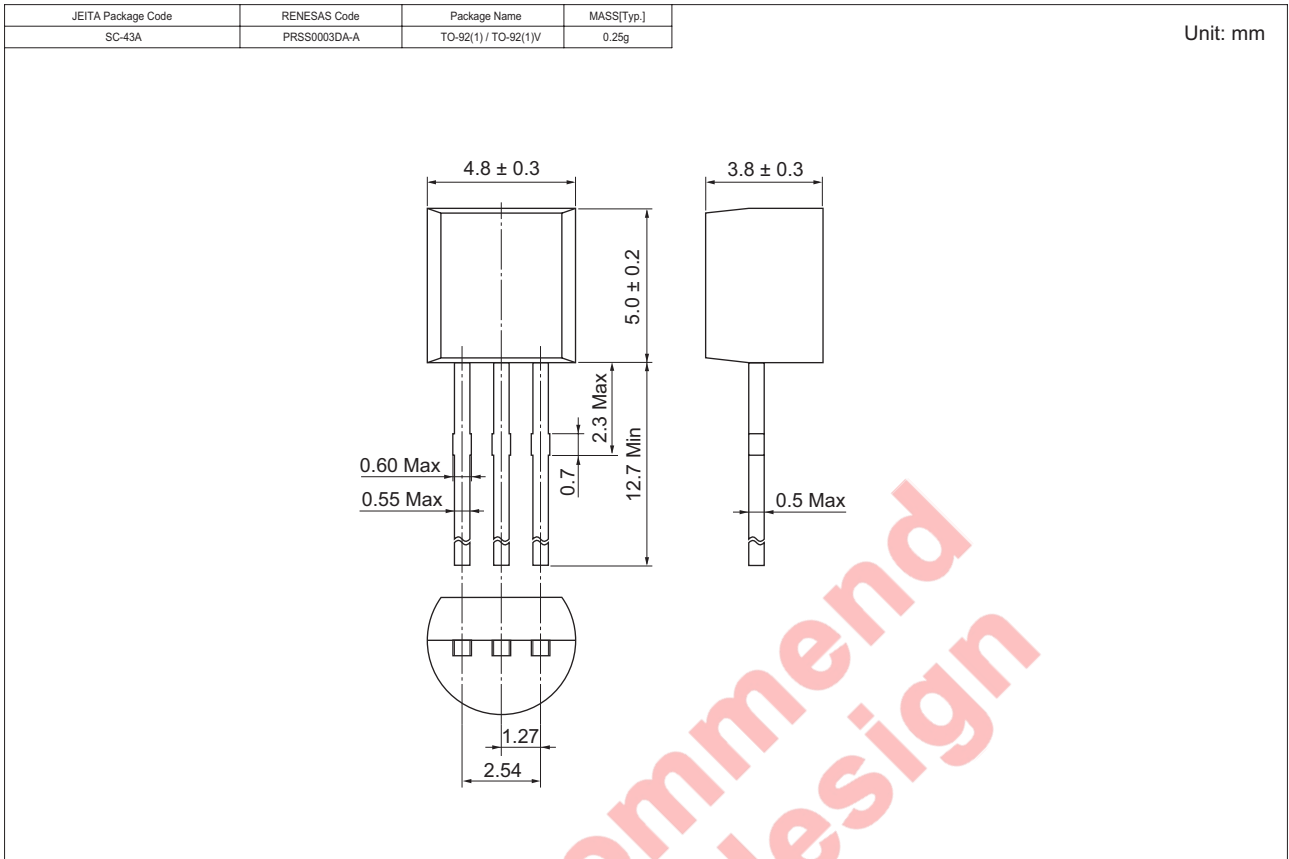
Noise Figure vs. Collector to Emitter Voltage





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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