

2SC460, 2SC461

Silicon NPN Epitaxial Planar

REJ03G0682-0200
 (Previous ADE-208-1046)
 Rev.2.00
 Aug.10.2005

Application

- 2SC460 high frequency amplifier, mixer
- 2SC461 VHF amplifier, mixer

Outline

RENESAS Package code: PRSS0003DA-C
 (Package name: TO-92 (2))



1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	2SC460	2SC461	Unit
Collector to base voltage	V_{CBO}	30	30	V
Collector to emitter voltage	V_{CEO}	30	30	V
Emitter to base voltage	V_{EBO}	5	5	V
Collector current	I_C	100	100	mA
Collector power dissipation	P_C	200	200	mW
Junction temperature	T_j	150	150	°C
Storage temperature	T_{stg}	-55 to +150	-55 to +150	°C

Electrical Characteristics

(Ta = 25°C)

Item	Symbol	2SC460			2SC461			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	30	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	30	—	—	30	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
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	μA	$V_{CB} = 18 \text{ V}, I_E = 0$
Emitter cutoff current	I_{EBO}	—	—	0.5	—	—	0.5	μA	$V_{EB} = 2 \text{ V}, I_C = 0$
Base to emitter voltage	V_{BE}	—	0.63	0.75	—	0.63	0.75	V	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
DC current transfer ratio	h_{FE}^{*1}	100	—	200	35	—	200		$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	0.6	1.1	—	0.6	1.1	V	$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$
Gain bandwidth product	f_T	—	230	—	—	230	—	MHz	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector output capacitance	C_{ob}	—	1.8	3.5	—	1.8	3.5	pF	$V_{CB} = 10 \text{ V}, I_E = 0,$ $f = 1 \text{ MHz}$
10.7 MHz power gain	PG	26	29	—	—	—	—	dB	$V_{CE} = 6 \text{ V}, I_E = -1 \text{ mA}$ $f = 10.7 \text{ MHz}$
100 MHz power gain	PG	—	—	—	13	17	—	dB	$V_{CE} = 6 \text{ V}, I_E = -1 \text{ mA}$ $f = 100 \text{ MHz}$
Noise figure	NF	—	2.0	—	—	—	—	dB	$V_{CE} = 6 \text{ V}, I_E = -1 \text{ mA}$ $f = 1 \text{ MHz}$ $R_g = 500 \Omega$

Note: 1. The 2SC461 is grouped by h_{FE} as follows.

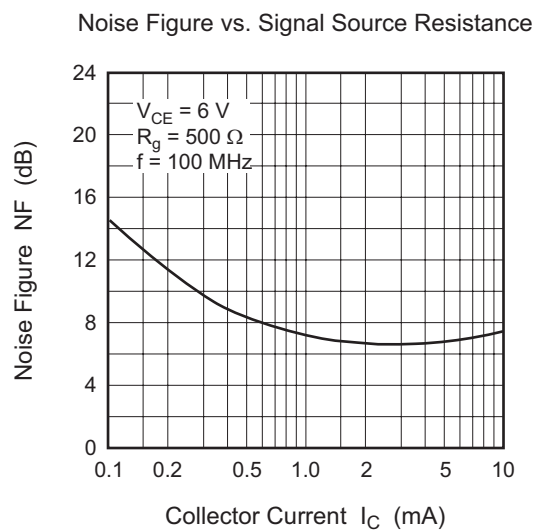
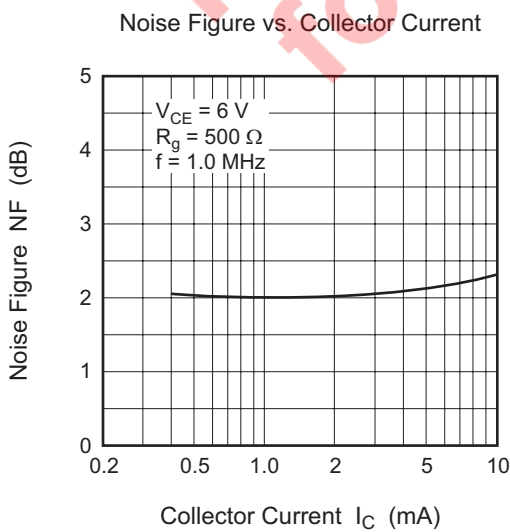
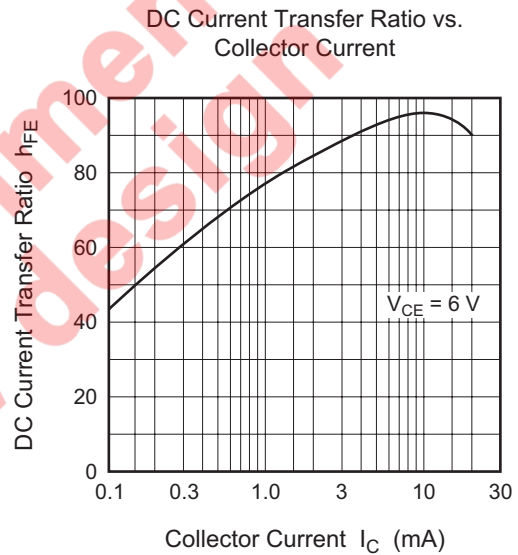
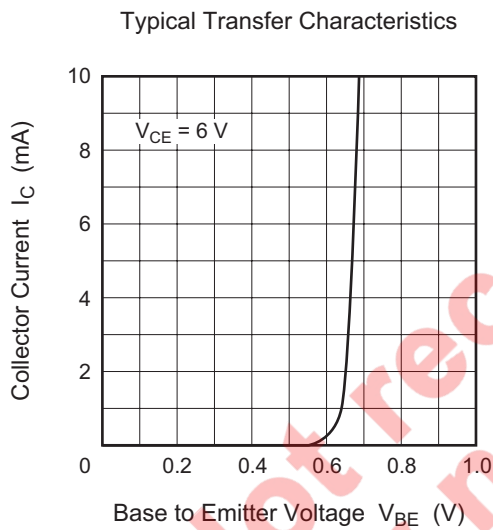
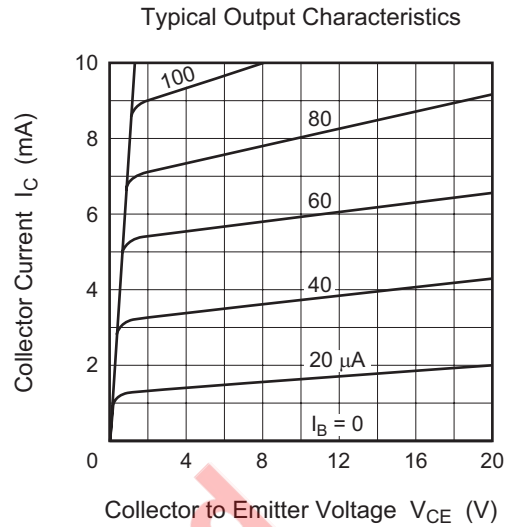
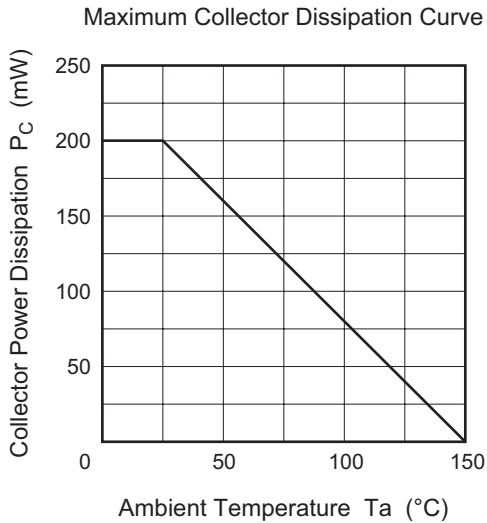
B	C
60 to 120	100 to 200

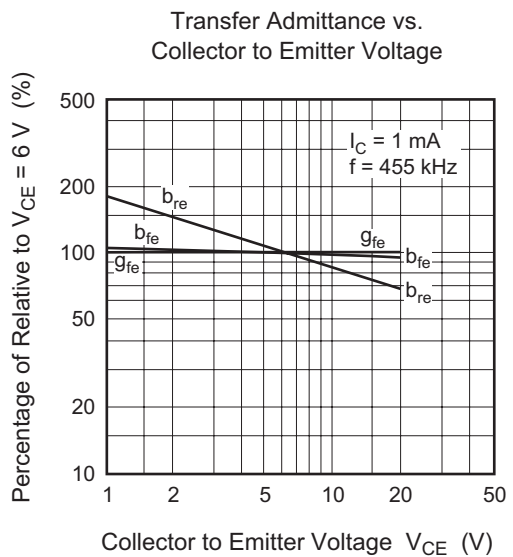
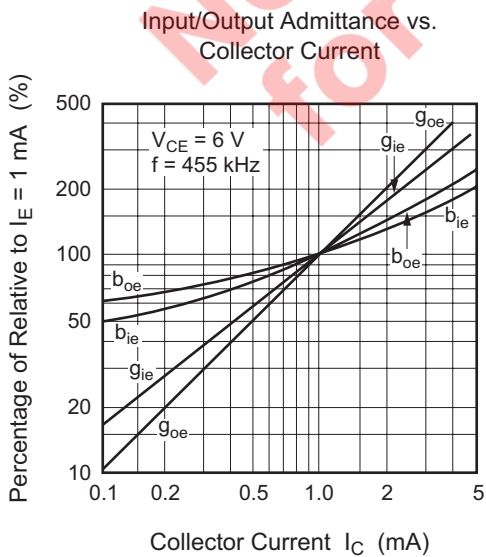
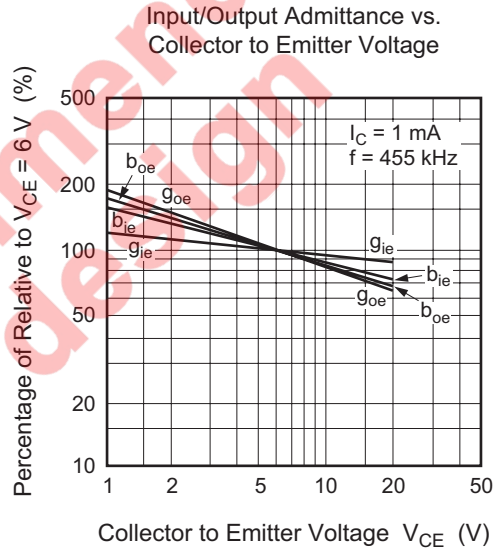
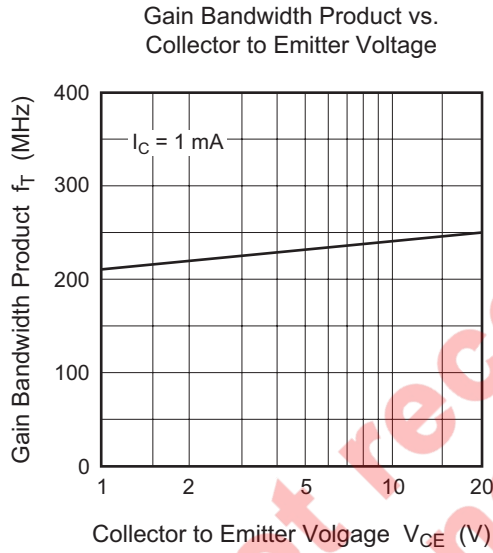
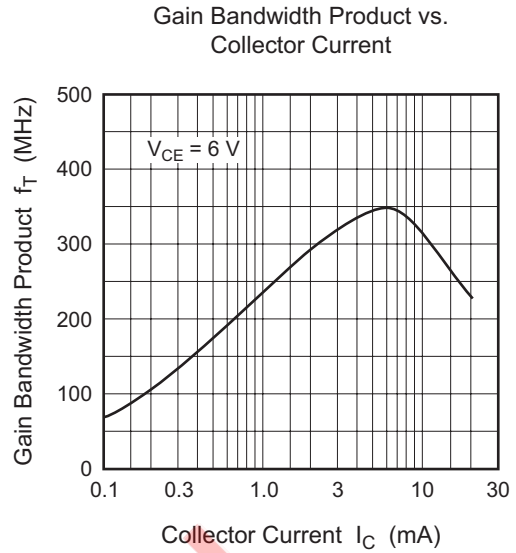
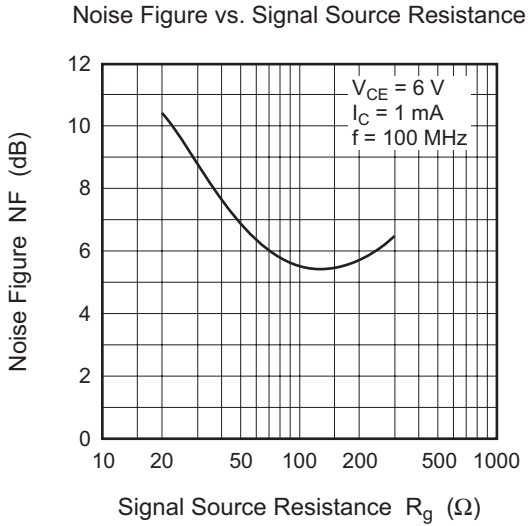
Small Signal y Parameters

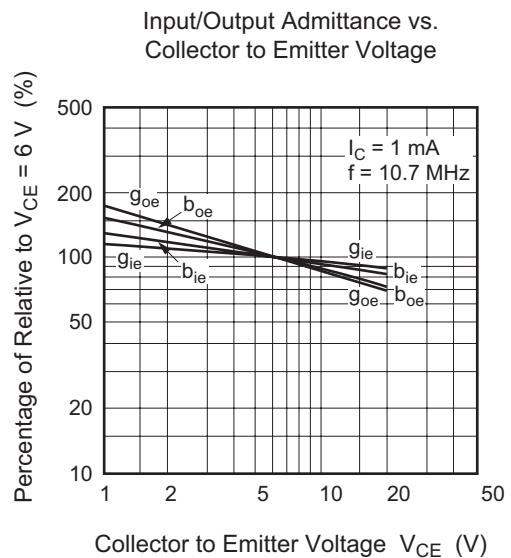
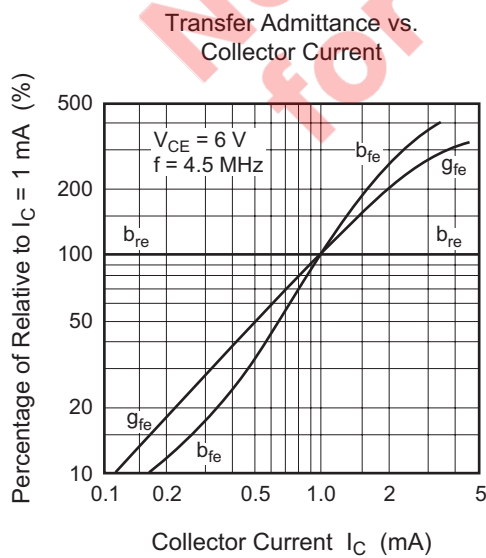
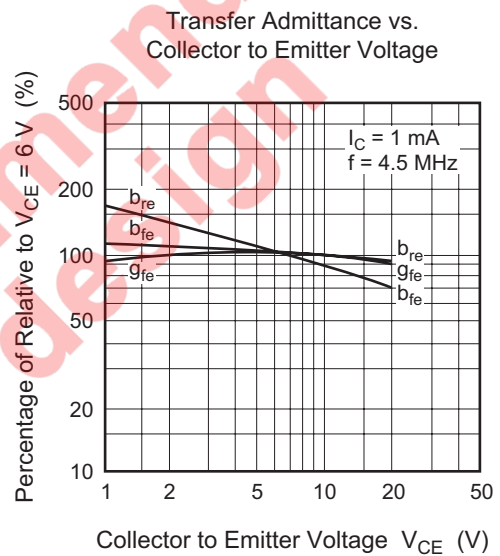
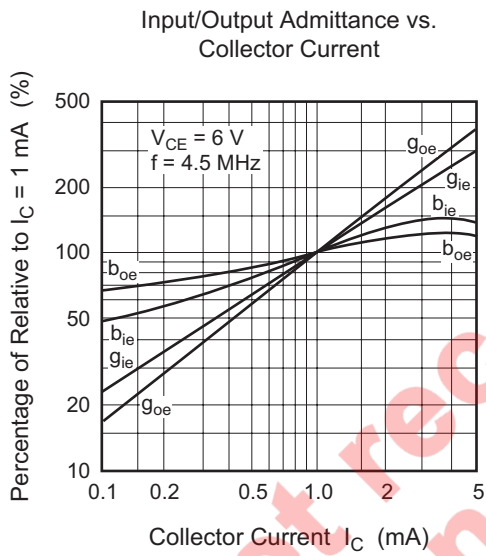
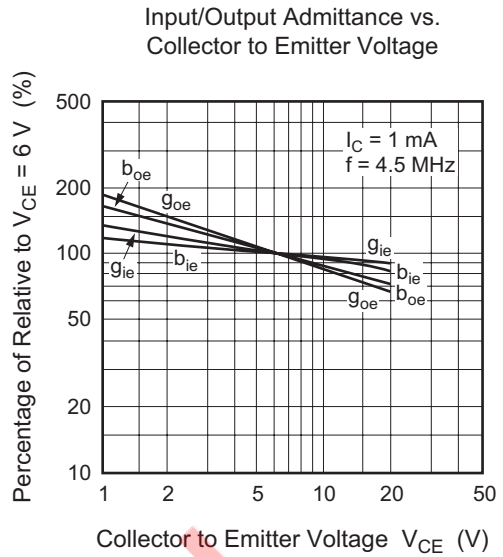
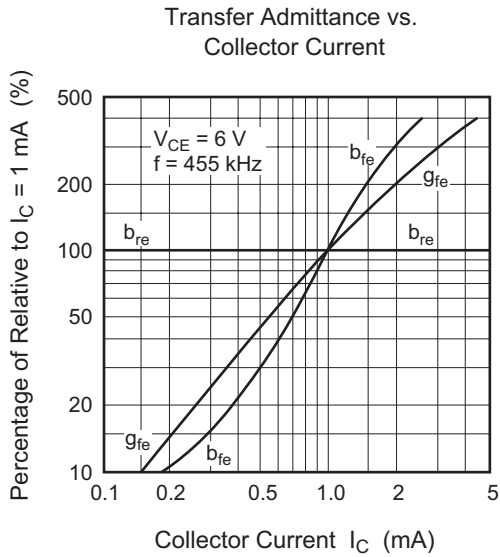
($V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}, \text{Emitter Common}$)

Item	Symbol	f	2SC460A, 2S461A	2SC460B, 2SC461B	2SC460C, 2SC461C	Unit
Input admittance	yie	455 kHz	$0.58 + j0.074$	$0.42 + j0.068$	$0.30 + j0.051$	mS
		4.5 MHz	$0.65 + j0.79$	$0.50 + j0.7$	$0.35 + j0.57$	
		10.7 MHz	$0.91 + j2.0$	$0.61 + j1.9$	$0.39 + j1.3$	
		100 MHz	$7.4 + j14$	$5.6 + j12$	$3.8 + j6.0$	
Reverse transfer admittance	yre	455 kHz	$-j0.003$	$-j0.003$	$-j0.003$	mS
		4.5 MHz	$-j0.04$	$-j0.04$	$-j0.04$	
		10.7 MHz	$-j0.13$	$-j0.13$	$-j0.13$	
		100 MHz	$-j1.0$	$-j1.0$	$-j1.0$	
Forward transfer admittance	yfe	455 kHz	$38 - j0.1$	$37 - j0.1$	$37 - j0.2$	mS
		4.5 MHz	$35 - j1.0$	$35 - j1.2$	$34 - j1.8$	
		10.7 MHz	$34 - j2.5$	$34 - j2.5$	$33 - j4.5$	
		100 MHz	$28 - j20$	$28 - j19$	$20 - j19$	
Output admittance	yoe	455 kHz	$0.0098 + j0.009$	$0.013 + j0.009$	$0.016 + j0.012$	mS
		4.5 MHz	$0.02 + j0.09$	$0.023 + j0.092$	$0.03 + j0.10$	
		10.7 MHz	$0.11 + j0.4$	$0.11 + j0.4$	$0.12 + j0.4$	
		100 MHz	$0.40 + j1.7$	$0.50 + j2.0$	$0.83 + j2.0$	

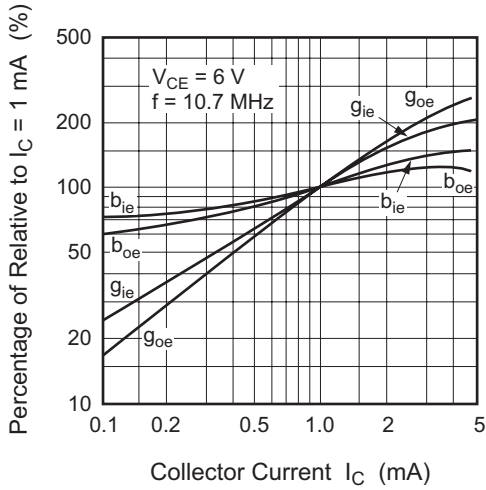
Main Characteristics



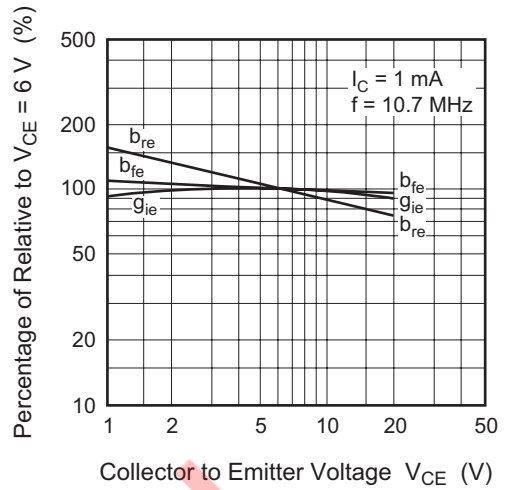




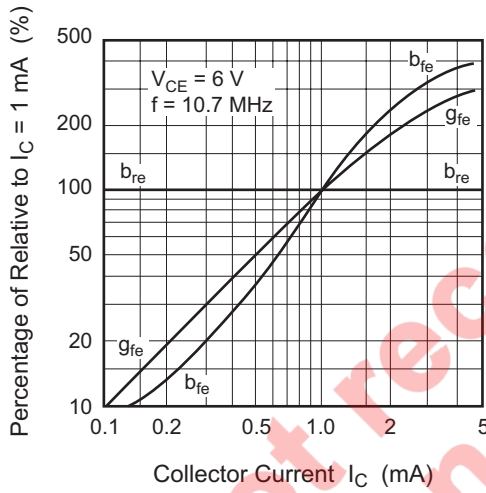
Input/Output Admittance vs. Collector Current



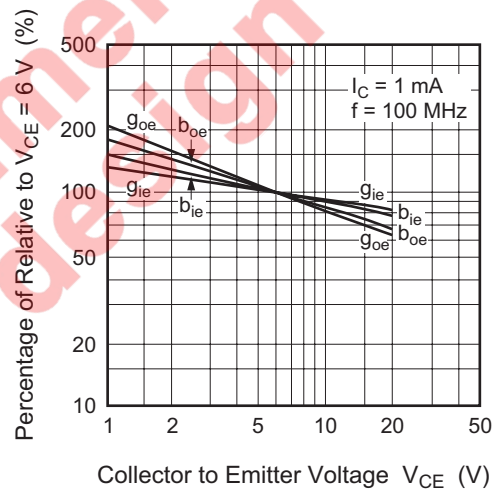
Transfer Admittance vs. Collector to Emitter Voltage



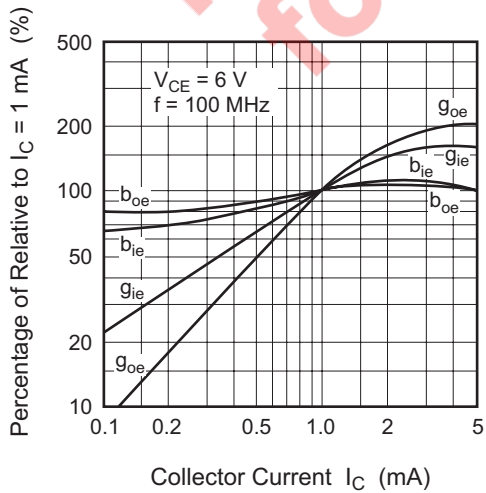
Transfer Admittance vs. Collector Current



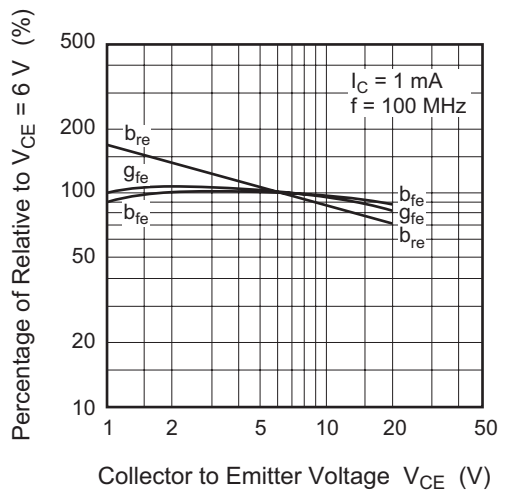
Input/Output Admittance vs. Collector to Emitter Voltage

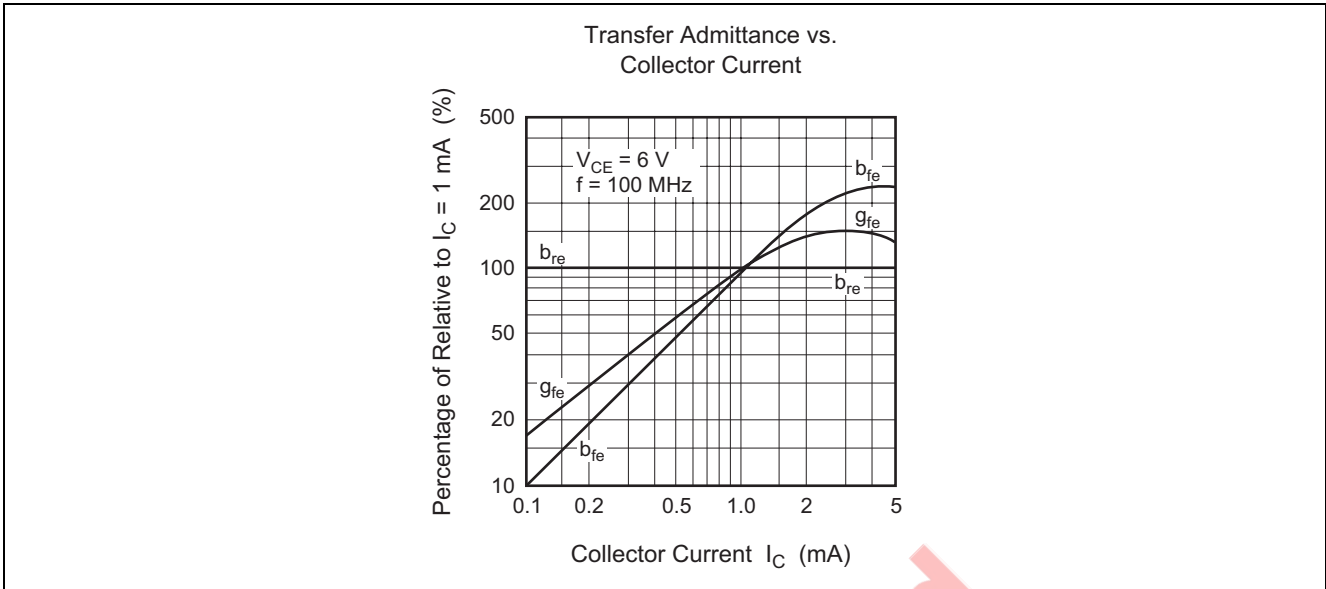


Input/Output Admittance vs. Collector Current



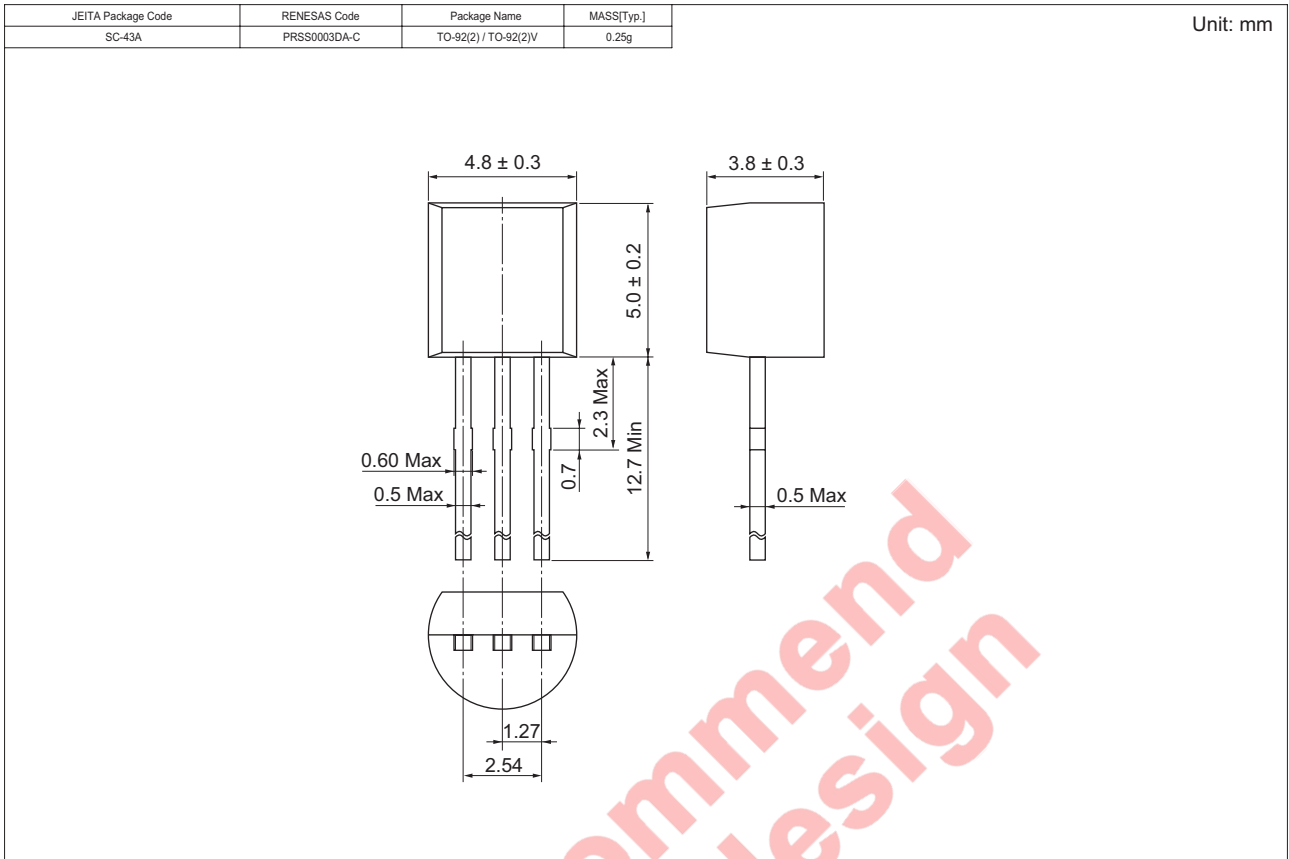
Transfer Admittance vs. Collector to Emitter Voltage





Not recommended
for new design

Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SC460CTZ 2SC461BTZ 2SC461CTZ	2500	Hold Box, Radial Taping

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