

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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Not recommended  
for new design

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# 2SB647, 2SB647A

Silicon PNP Epitaxial

REJ03G0648-0200  
 (Previous ADE-208-1025)  
 Rev.2.00  
 Aug.10.2005

## Application

- Low frequency power amplifier
- Complementary pair with 2SD667/A

## Outline

RENESAS Package code: PRSS0003DC-A  
 (Package name: TO-92 Mod)



1. Emitter
2. Collector
3. Base

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	2SB647	2SB647A	Unit
Collector to base voltage	$V_{CBO}$	-120	-120	V
Collector to emitter voltage	$V_{CEO}$	-80	-100	V
Emitter to base voltage	$V_{EBO}$	-5	-5	V
Collector current	$I_C$	-1	-1	A
Collector peak current	$i_{C(peak)}$	-2	-2	A
Collector power dissipation	$P_C$	0.9	0.9	W
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	2SB647			2SB647A			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	-120	—	—	-120	—	—	V	$I_C = -10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	-80	—	—	-100	—	—	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	$I_{CBO}$	—	—	-10	—	—	-10	$\mu A$	$V_{CB} = -100 \text{ V}, I_E = 0$
DC current transfer ratio	$h_{FE1}^{*1}$	60	—	320	60	—	200		$V_{CE} = -5 \text{ V}, I_C = -150 \text{ mA}^{*2}$
	$h_{FE2}$	30	—	—	30	—	—		$V_{CE} = -5 \text{ V}, I_C = -500 \text{ mA}^{*2}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	-1	—	—	-1	V	$I_C = -500 \text{ mA}, I_B = -50 \text{ mA}^{*2}$
Base to emitter voltage	$V_{BE}$	—	—	-1.5	—	—	-1.5	V	$V_{CE} = -5 \text{ V}, I_C = -150 \text{ mA}^{*2}$
Gain bandwidth product	$f_T$	—	140	—	—	140	—	MHz	$V_{CE} = -5 \text{ V}, I_C = -150 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	20	—	—	20	—	pF	$V_{CB} = -10 \text{ V}, I_E = 0$ $f = 1 \text{ MHz}$

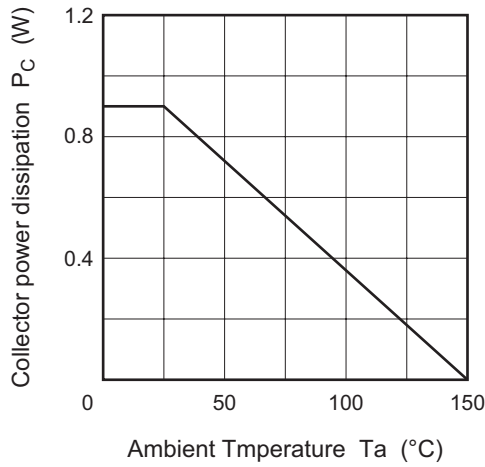
Notes: 1. The 2SB647 and 2SB647A are grouped by  $h_{FE1}$  as follows.

2. Pulse test

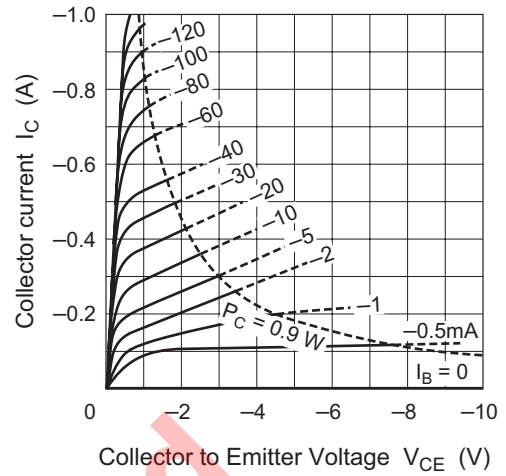
	B	C	D
2SB647	—	100 to 200	160 to 320
2SB647A	60 to 120	100 to 200	—

Main Characteristics

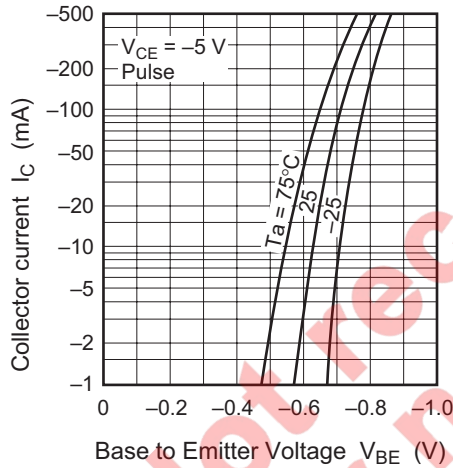
Maximum Collector Dissipation Curve



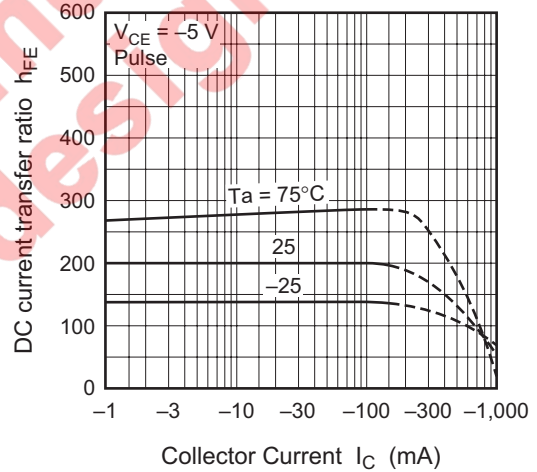
Typical Output Characteristics



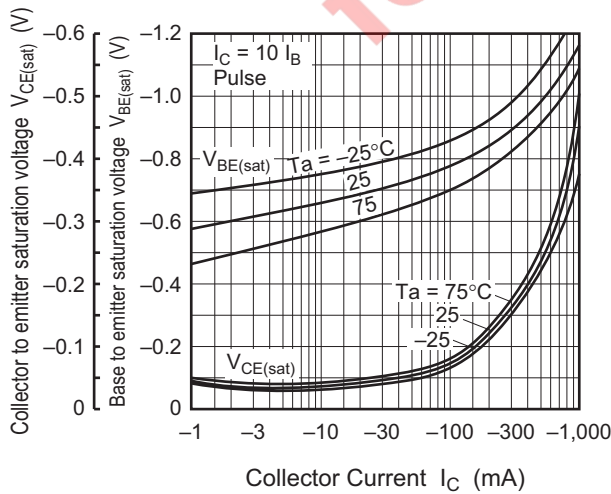
Typical Transfer Characteristics



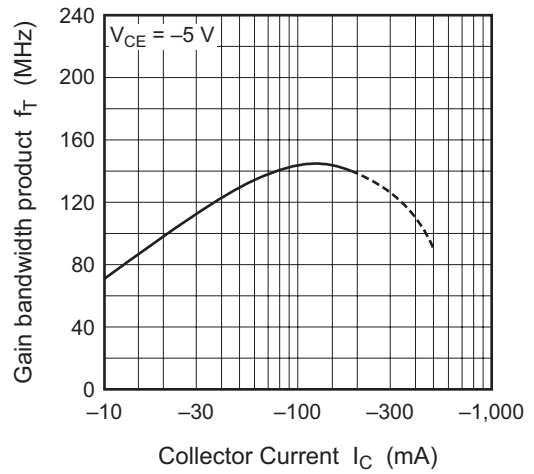
DC Current Transfer Ratio vs. Collector Current

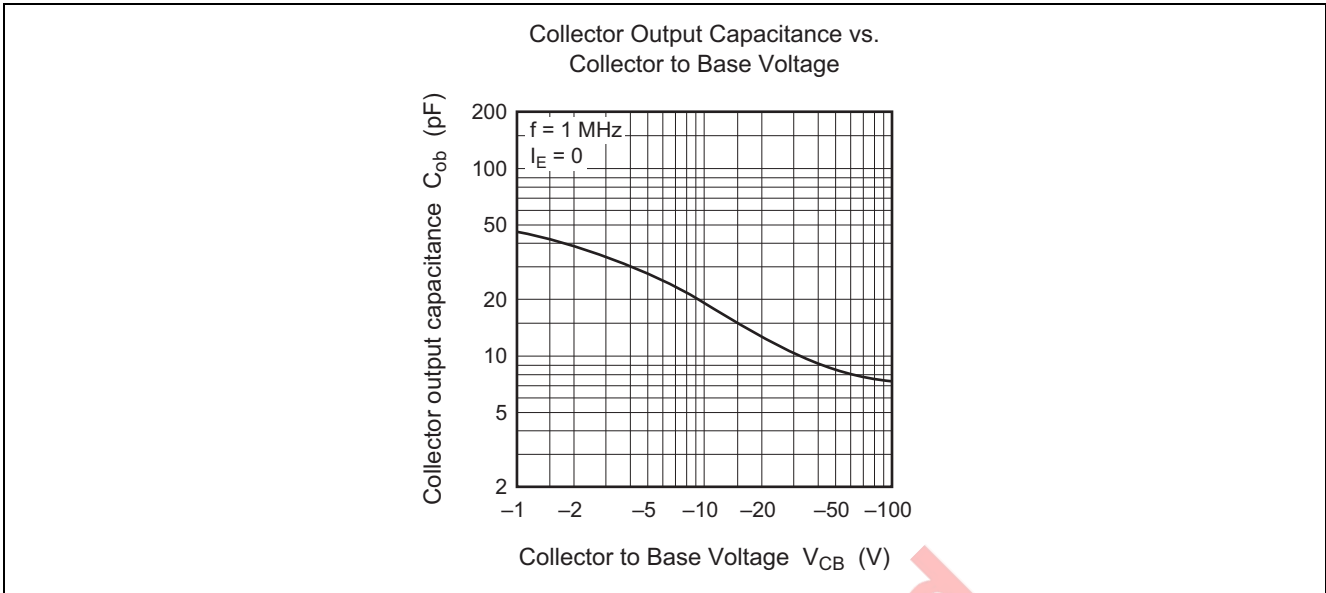


Saturation Voltage vs. Collector Current



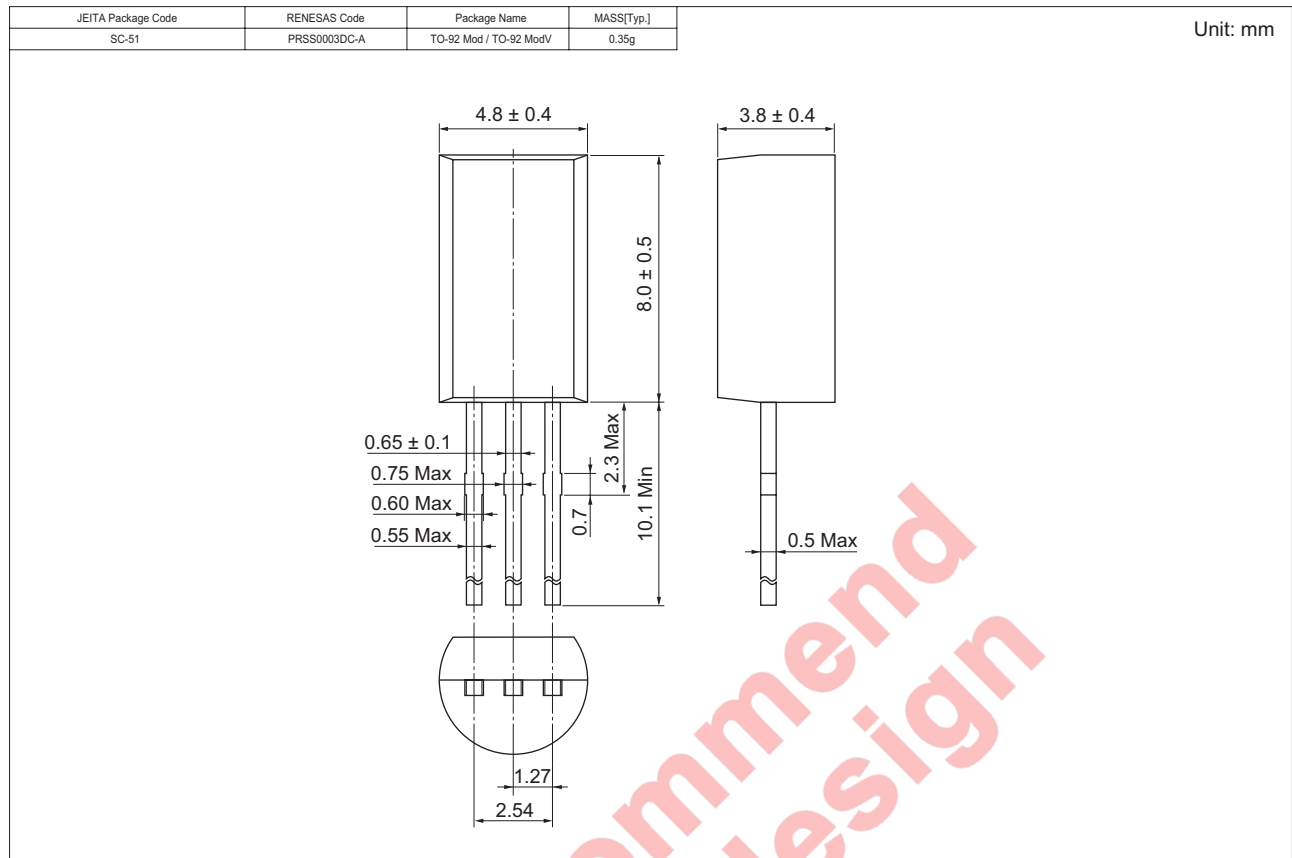
Gain Bandwidth Product vs. Collector Current





Not recommended for new design

## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
2SB647CTZ-E 2SB647DTZ-E 2SB647ABTZ-E 2SB647ACTZ-E	2500	Hold Box, Radial Taping

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