

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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Keep safety first in your circuit designs!

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Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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# 2SB1390

Silicon PNP Triple Diffused

RENESAS

ADE-208-870 (Z)

1st. Edition

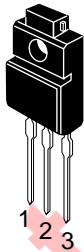
September 2000

## Application

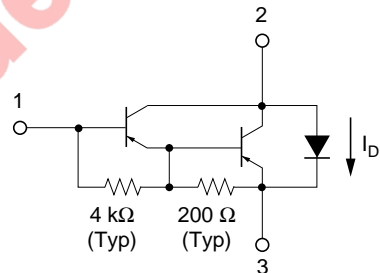
Low frequency power amplifier

## Outline

TO-220FM



- 1. Base
- 2. Collector
- 3. Emitter



## Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	-60	V
Collector to emitter voltage	$V_{CEO}$	-60	V
Emitter to base voltage	$V_{EBO}$	-7	V
Collector current	$I_C$	-8	A
Collector peak current	$I_{C(peak)}$	-12	A
Collector power dissipation	$P_C$	2	W
	$P_C^{*1}$	25	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C
C to E diode forward current	$I_D^{*1}$	8	A

Note: 1. Value at  $T_C = 25^\circ\text{C}$ .

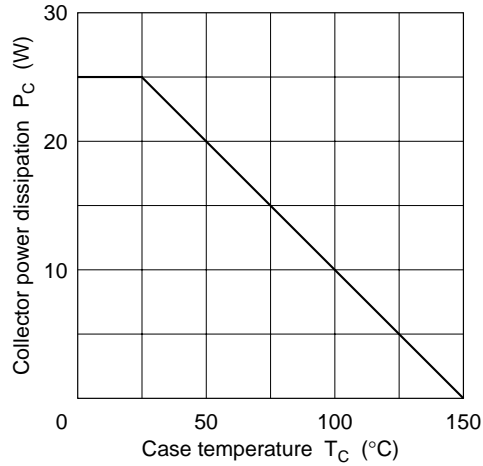
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	-60	—	—	V	$I_C = -0.1\text{ mA}$ , $I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	-60	—	—	V	$I_C = -25\text{ mA}$ , $R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	-7	—	—	V	$I_E = -50\text{ mA}$ , $I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	-10	$\mu\text{A}$	$V_{CB} = -50\text{ V}$ , $I_E = 0$
	$I_{CEO}$	—	—	-10		$V_{CE} = -50\text{ V}$ , $R_{BE} = \infty$
DC current transfer ratio	$h_{FE}$	1000	—	20000		$V_{CE} = -3\text{ V}$ , $I_C = -4\text{ A}^{*1}$
Collector to emitter saturation voltage	$V_{CE(sat)1}$	—	—	-1.5	V	$I_C = -4\text{ A}$ , $I_B = -8\text{ mA}^{*1}$
	$V_{CE(sat)2}$	—	—	-3.0		$I_C = -8\text{ A}$ , $I_B = -80\text{ mA}^{*1}$
Base to emitter saturation voltage	$V_{BE(sat)1}$	—	—	-2.0	V	$I_C = -4\text{ A}$ , $I_B = -8\text{ mA}^{*1}$
	$V_{BE(sat)2}$	—	—	-3.5		$I_C = -8\text{ A}$ , $I_B = -80\text{ mA}^{*1}$
C to E diode forward voltage	$V_D$	—	—	3.0	V	$I_D = 8\text{ A}^{*1}$

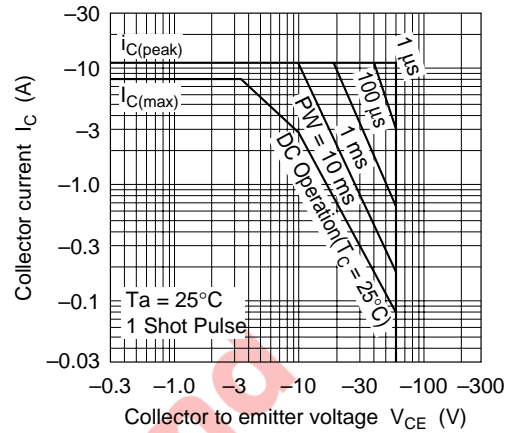
Note: 1. Pulse test.

See switching characteristic curve of 2SB1103.

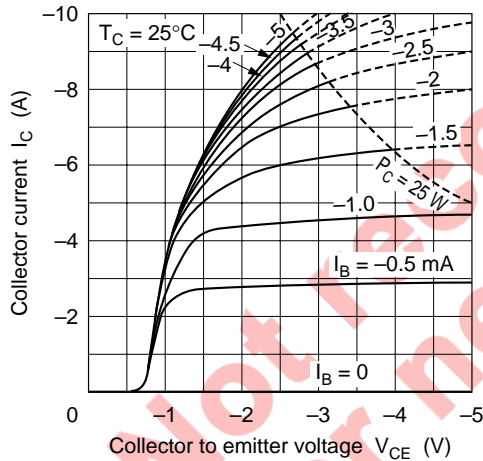
Maximum Collector Dissipation Curve



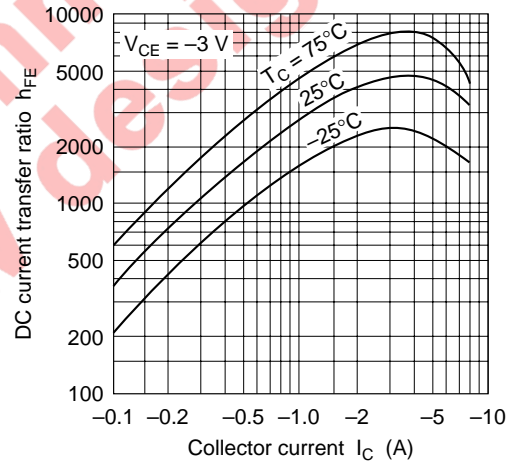
Area of Safe Operation



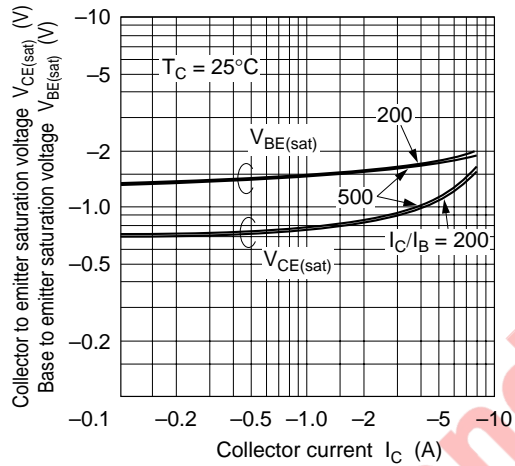
Typical Output Characteristics



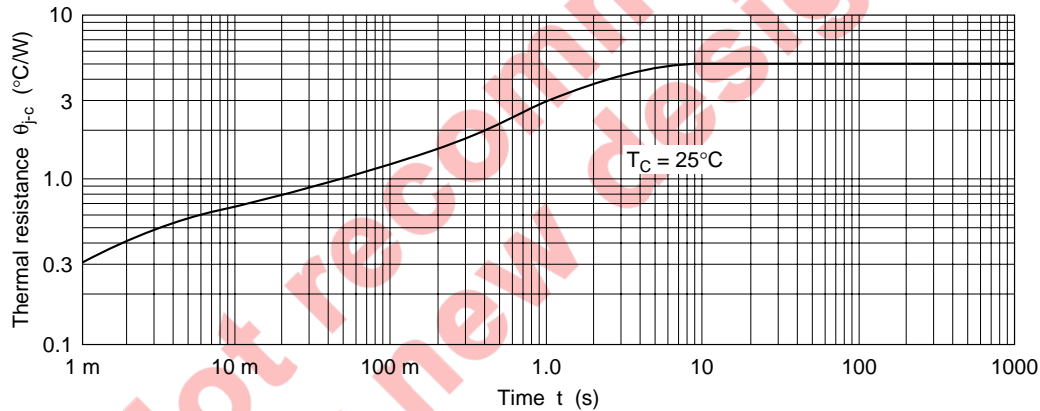
DC Current Transfer Ratio vs. Collector Current



Saturation Voltage vs.  
Collector Current



Transient Thermal Resistance



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