

To all our customers

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

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

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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2SD1606

Silicon NPN Triple Diffused

RENESAS

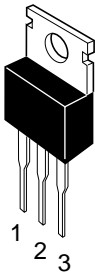
ADE-208-915 (Z)
1st. Edition
September 2000

Application

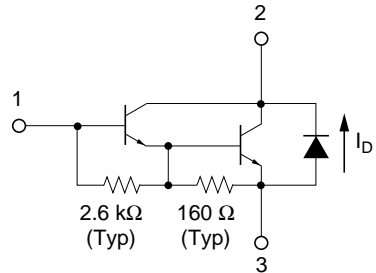
Low frequency power amplifier

Outline

TO-220AB



1. Base
2. Collector (Flange)
3. Emitter



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	120	V
Collector to emitter voltage	V_{CEO}	120	V
Emitter to base voltage	V_{EBO}	7	V
Collector current	I_C	6	A
Collector peak current	$I_{C(peak)}$	12	A
Collector power dissipation	P_C^{*1}	40	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C
C to E diode forward current	I_D^{*1}	6	A

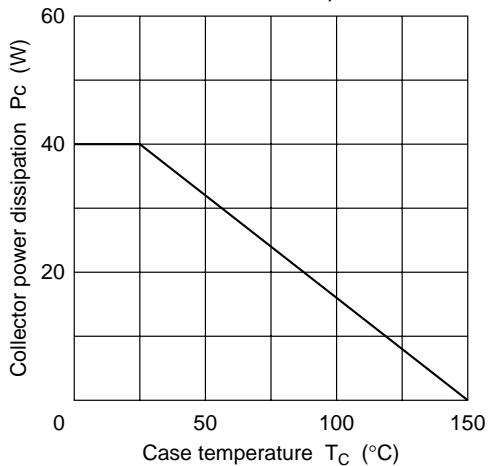
Note: 1. Value at $T_C = 25^\circ\text{C}$.

Electrical Characteristics (Ta = 25°C)

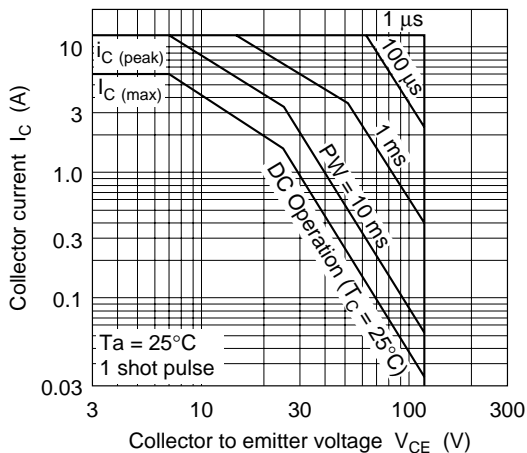
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	120	—	—	V	$I_C = 25\text{ mA}$, $R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	7	—	—	V	$I_E = 50\text{ mA}$, $I_C = 0$
Collector cutoff current	I_{CBO}	—	—	100	μA	$V_{CB} = 120\text{ V}$, $I_E = 0$
	I_{CEO}	—	—	10	μA	$V_{CE} = 100\text{ V}$, $R_{BE} = \infty$
DC current transfer ratio	h_{FE}	1000	—	20000		$V_{CE} = 3\text{ V}$, $I_C = 3\text{ A}^{*1}$
Collector to emitter saturation voltage	$V_{CE(sat)1}$	—	—	1.5	V	$I_C = 3\text{ A}$, $I_B = 6\text{ mA}^{*1}$
	$V_{CE(sat)2}$	—	—	3.0	V	$I_C = 6\text{ A}$, $I_B = 60\text{ mA}^{*1}$
Base to emitter saturation voltage	$V_{BE(sat)1}$	—	—	2.0	V	$I_C = 3\text{ A}$, $I_B = 6\text{ mA}^{*1}$
	$V_{BE(sat)2}$	—	—	3.5	V	$I_C = 6\text{ A}$, $I_B = 60\text{ mA}^{*1}$
C to E diode forward voltage	V_D	—	—	3.0	V	$I_D = 6\text{ A}^{*1}$
Turn on time	t_{on}	—	0.6	—	μs	$I_C = 3\text{ A}$, $I_{B1} = -I_{B2} = 6\text{ mA}$
Storage time	t_{stg}	—	7.0	—	μs	
Fall time	t_f	—	2.0	—	μs	

Note: 1. Pulse test.

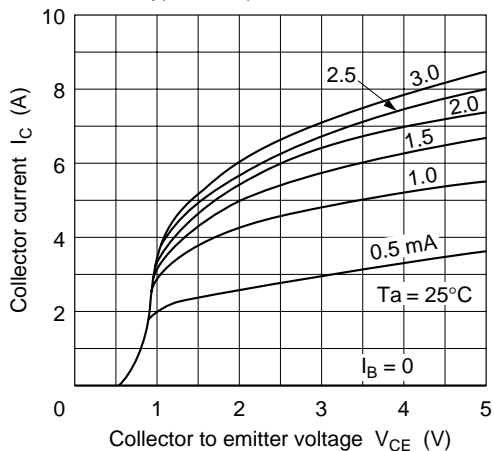
Maximum Collector Dissipation Curve



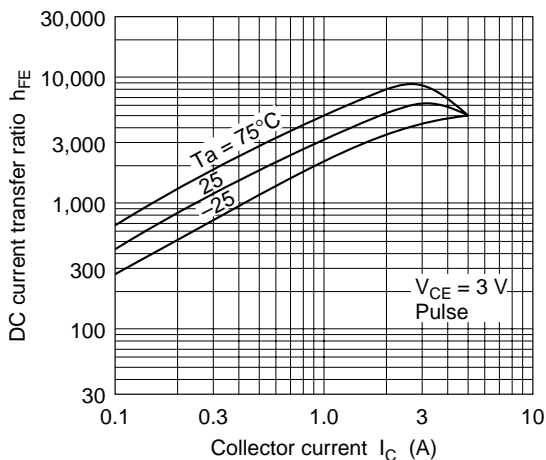
Area of Safe Operation

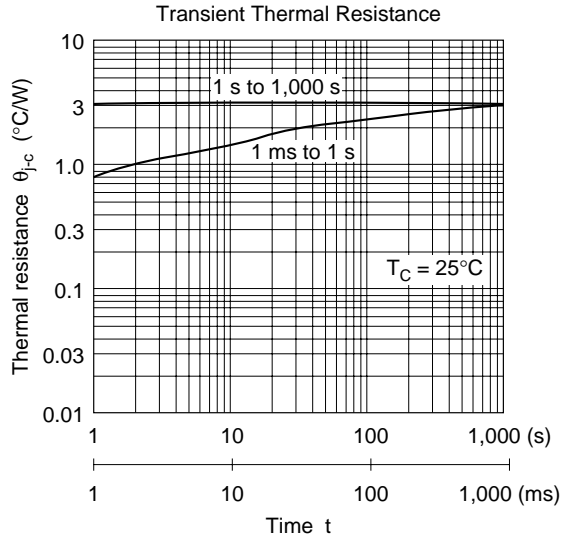
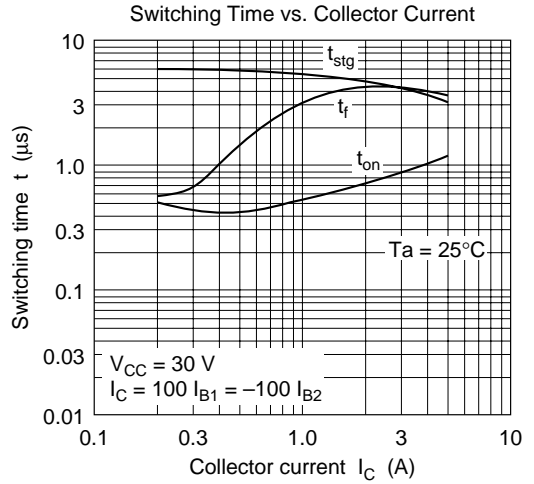
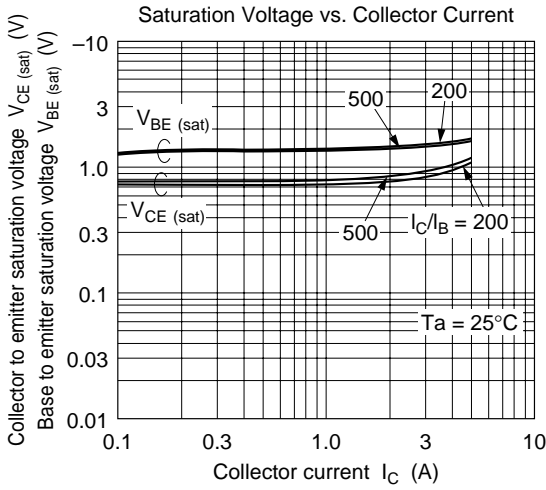


Typical Output Characteristics



DC Current Transfer Ratio vs. Collector Current





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