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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.

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2SA778(K), 2SA778A(K)

Silicon PNP Epitaxial

RENESAS

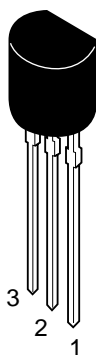
ADE-208-314 (Z)
1st. Edition
Mar. 2001

Application

High voltage medium speed switching

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

2SA778(K), 2SA778A(K)

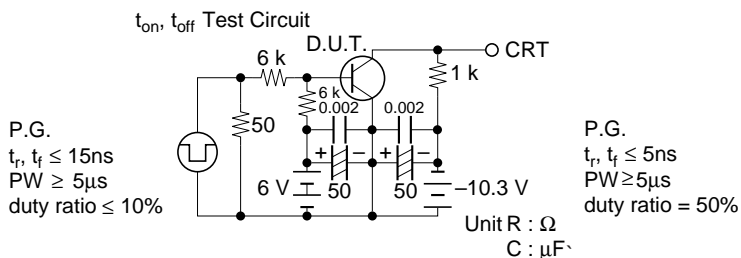
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	2SA778(K)	2SA778A(K)	Unit
Collector to base voltage	V_{CBO}	-150	-180	V
Collector to emitter voltage	V_{CEO}	-150	-180	V
Emitter to base voltage	V_{EBO}	-5	-5	V
Collector current	I_C	-50	-50	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

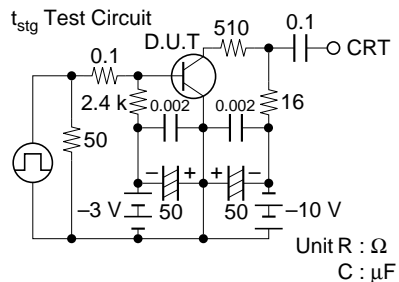
Electrical Characteristics (Ta = 25°C)

Item	Symbol	2SA778(K)			2SA778A(K)			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	-150	—	—	-180	—	—	V	$I_C = -50 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CER}$	-150	—	—	-180	—	—	V	$I_C = -50 \mu A, R_{BE} = 30 k\Omega$
Collector cutoff current	I_{CBO}	—	—	-1.0	—	—	—	μA	$V_{CB} = -100 V, I_E = 0$
		—	—	—	—	—	-1.0	μA	$V_{CB} = -150 V, I_E = 0$
Emitter cutoff current	I_{EBO}	—	—	-1.0	—	—	-1.0	μA	$V_{EB} = -5 V, I_C = 0$
DC current transfer ratio	h_{FE}	30	100	—	40	100	200		$V_{CE} = -3 V, I_E = -15 mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	-0.3	-1.0	—	-0.3	-1.0	V	$I_C = -15 mA, I_B = -1 mA$
Base to emitter saturation voltage	$V_{BE(sat)}$	—	-0.77	-1.0	—	-0.77	-1.0	V	$I_C = -15 mA, I_B = -1 mA$
Collector output capacitance	C_{ob}	—	—	10	—	—	10	pF	$V_{CB} = -10 V, I_E = 0, f = 1 MHz$
Gain bandwidth product	f_T	—	50	—	—	50	—	MHz	$V_{CE} = -3 V, I_C = -15 mA$
Turn on time	t_{on}	—	135	—	—	135	—	ns	$V_{CC} = -10.3 V$
Turn off time	t_{off}	—	1.7	—	—	1.7	—	μs	$I_C = 10 I_{B1} = -10 I_{B2} = -10 mA$
Storage time	t_{stg}	—	—	1.0	—	—	1.0	μs	$V_{CC} = -10 V, I_C = -17 mA, I_{B1} = -1 mA, I_{B2} = -12 mA$

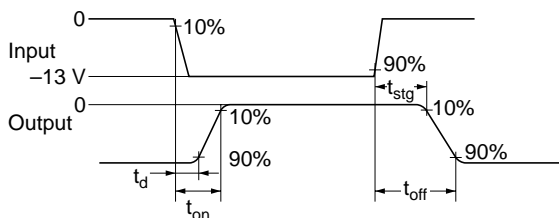
Switching Time Test Circuit



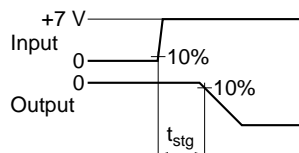
Switching Time Test Circuit

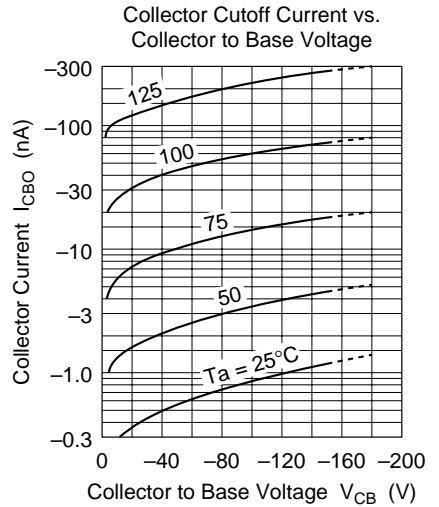
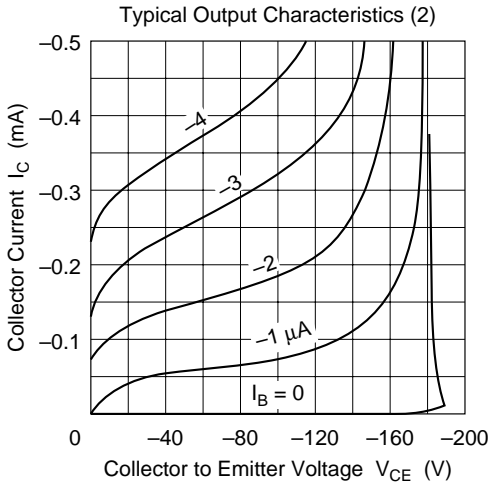
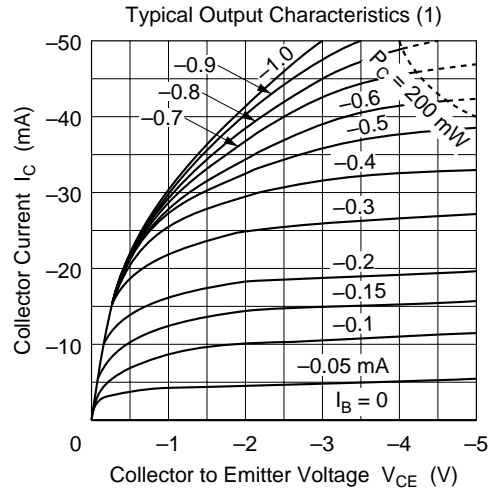
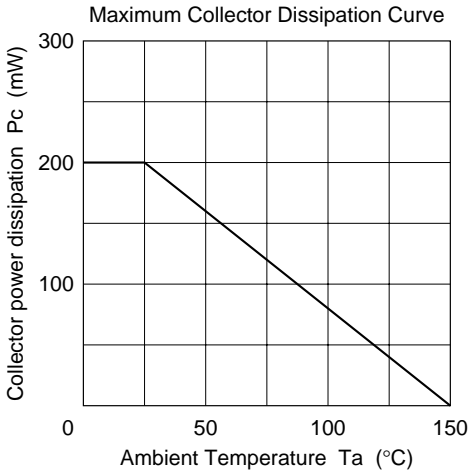


Response Waveform

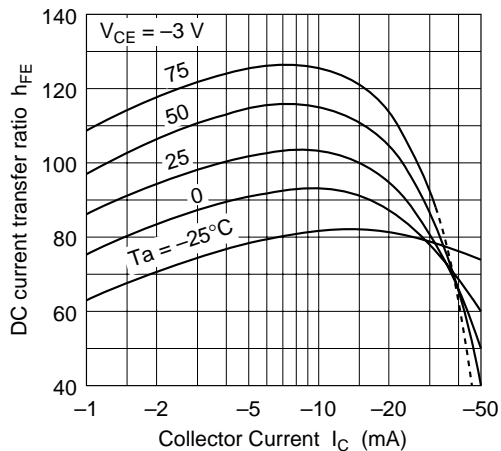


Response Waveform

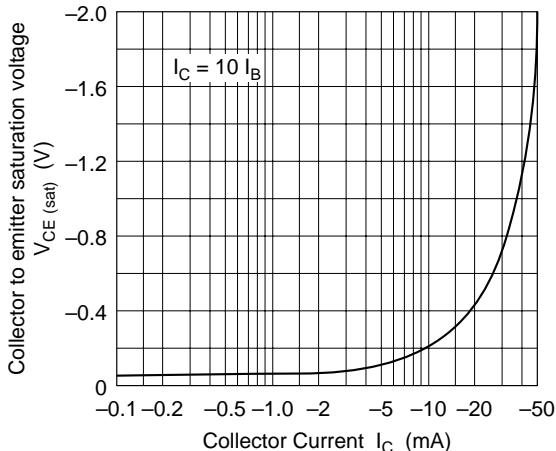




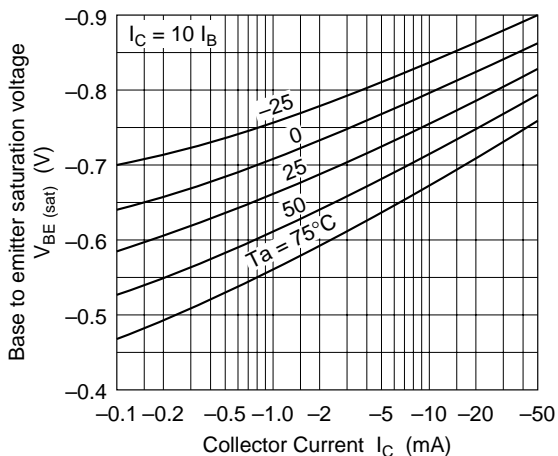
DC Current Transfer Ratio vs. Collector Current



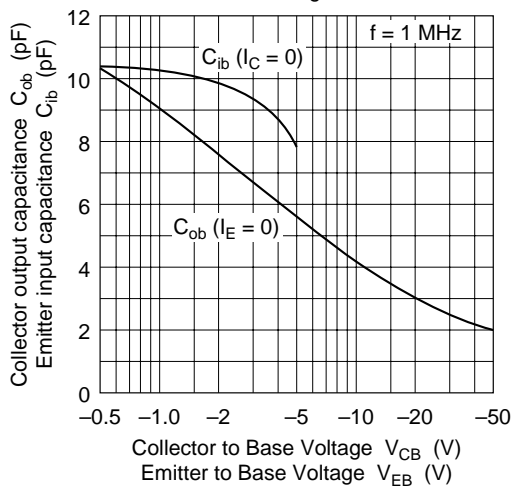
Collector to Emitter Saturation Voltage vs. Collector Current



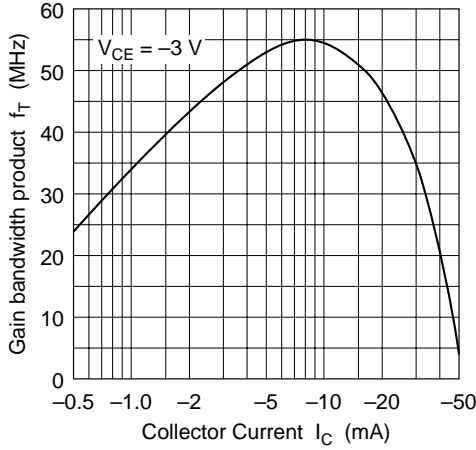
Base to Emitter Saturation Voltage vs. Collector Current



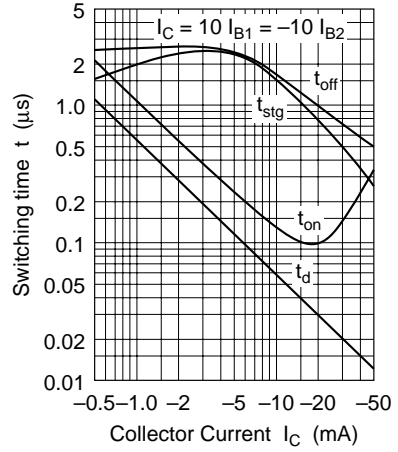
Input and Output Capacitance vs. Voltage



Gain Bandwidth Product vs. Collector Current

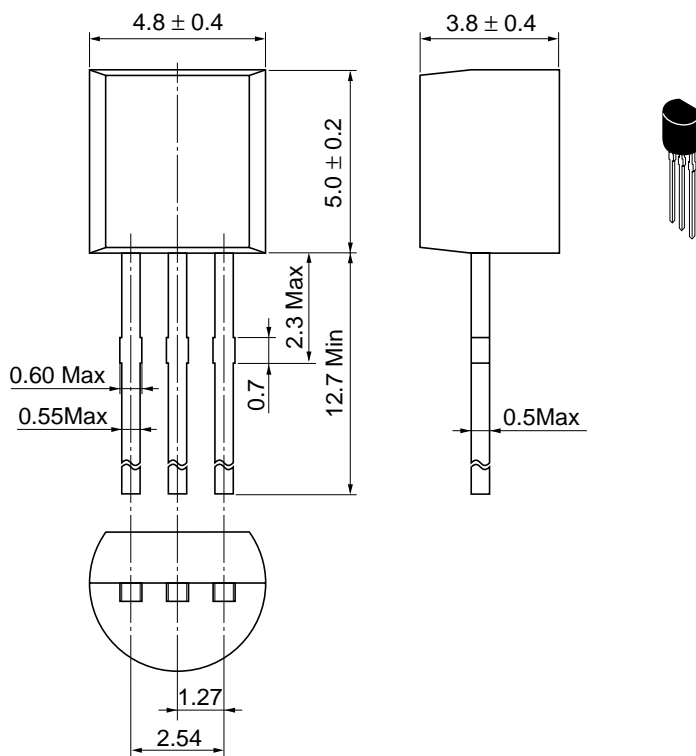


Switching Time vs. Collector Current



Package Dimensions

As of January, 2001
Unit: mm



Hitachi Code	TO-92 (1)
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.25 g

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