2SA778(K), 2SA778A(K)

Silicon PNP Epitaxial

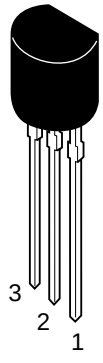
HITACHI

Application

High voltage medium speed switching

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

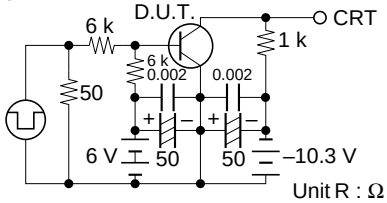
Item	Symbol	2SA778(K)	2SA778A(K)	Unit
Collector to base voltage	V_{CBO}	–150	–180	V
Collector to emitter voltage	V_{CEO}	–150	–180	V
Emitter to base voltage	V_{EBO}	–5	–5	V
Collector current	I_C	–50	–50	mA
Collector power dissipation	P_C	200	200	mW
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

Electrical Characteristics (Ta = 25°C)

		2SA778(K)			2SA778A(K)				
Item	Symbol	Min	Typ	Max	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	–150	—	—	–180	—	—	V	I_C = –50 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CER}$	–150	—	—	–180	—	—	V	I_C = –50 µA, R_{BE} = 30 kΩ
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	Cob	—	—	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} = –1mA, I_{B2} = –12 mA

Switching Time Test Circuit

t_{on}, t_{off} Test Circuit

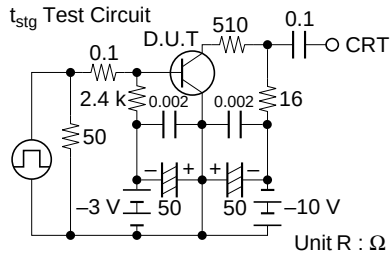


P.G.
t_r, t_f ≤ 15ns
PW ≥ 5µs
duty ratio ≤ 10%

Unit R : Ω
C : µF

Switching Time Test Circuit

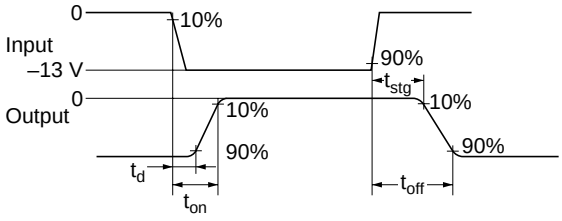
t_{stg} Test Circuit



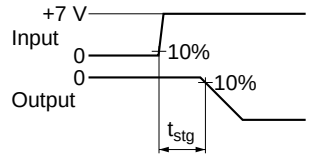
P.G.
t_r, t_f ≤ 5ns
PW ≥ 5µs
duty ratio = 50%

Unit R : Ω
C : µF

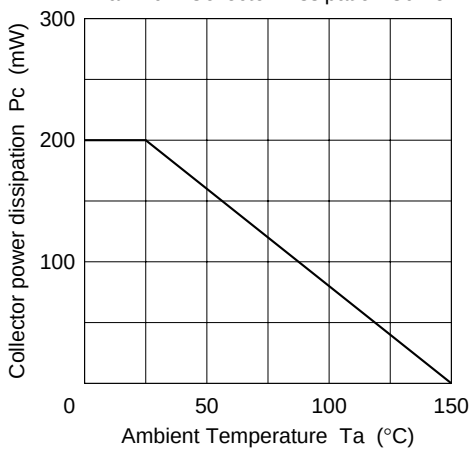
Response Waveform



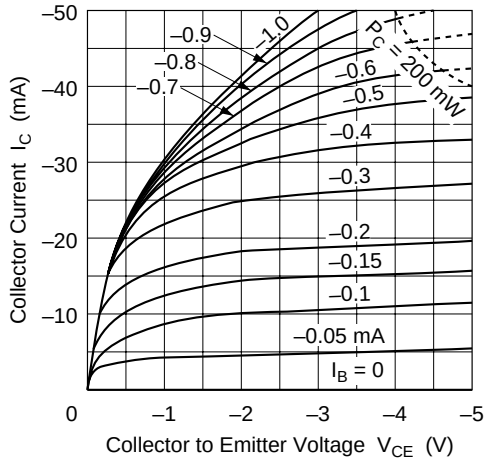
Response Waveform



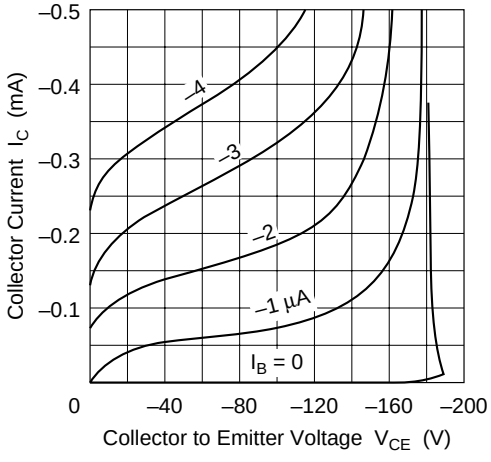
Maximum Collector Dissipation Curve



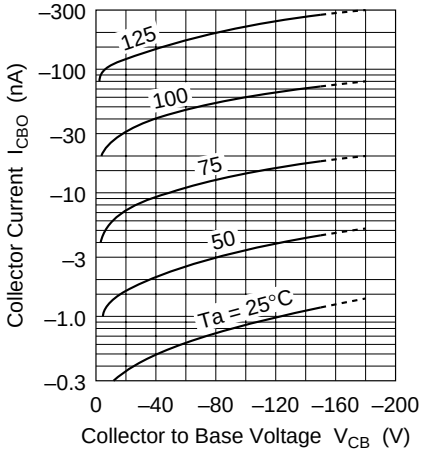
Typical Output Characteristics (1)



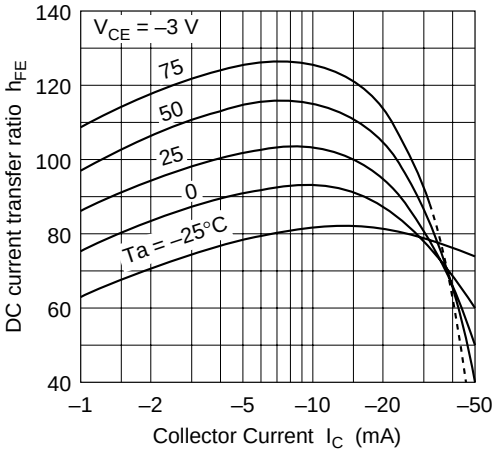
Typical Output Characteristics (2)



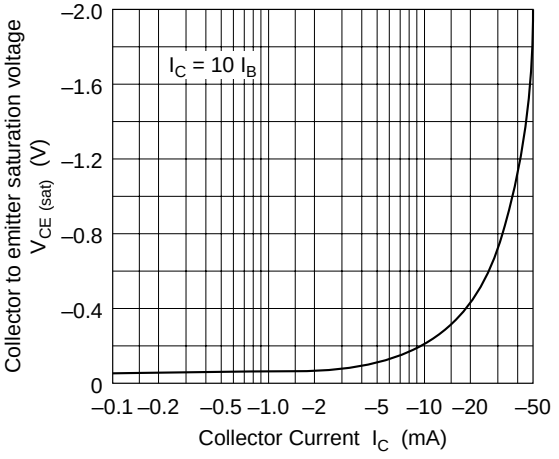
Collector Cutoff Current vs. Collector to Base Voltage



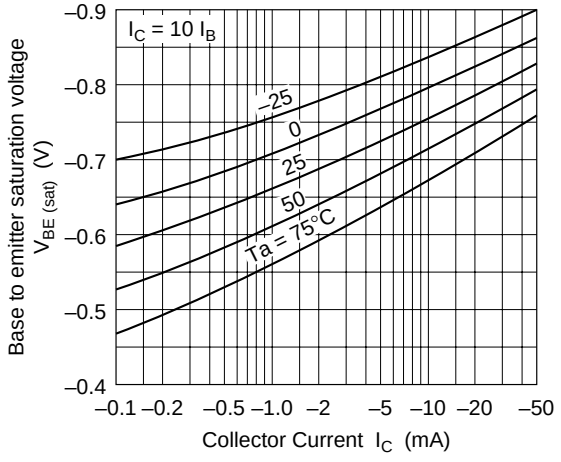
DC Current Transfer Ratio vs. Collector Current



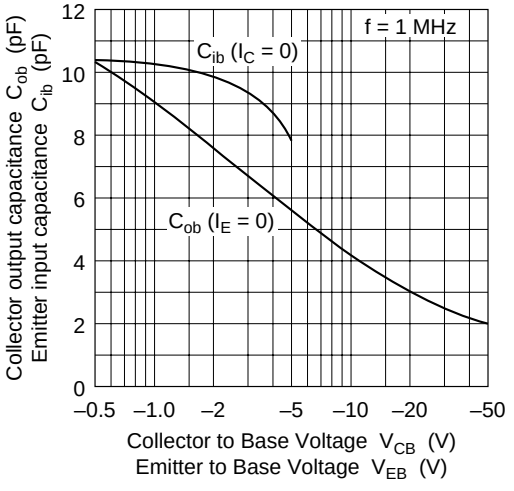
Collector to Emitter Saturation Voltage vs. Collector Current



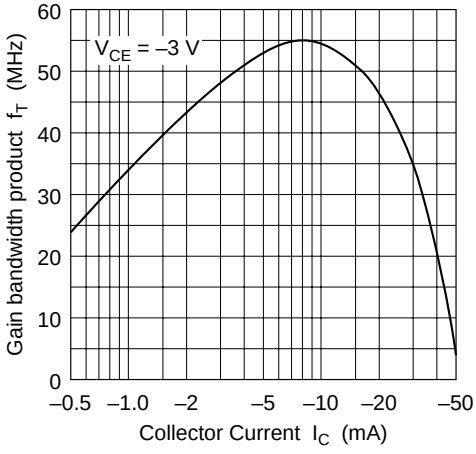
Base to Emitter Saturation Voltage vs. Collector Current



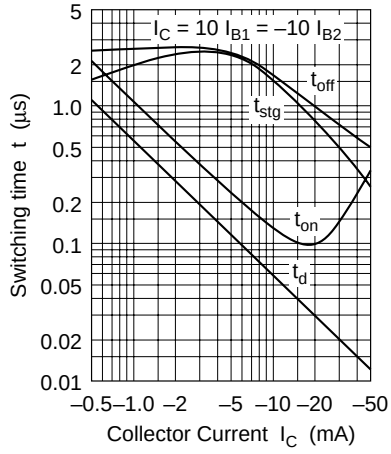
Input and Output Capacitance vs. Voltage



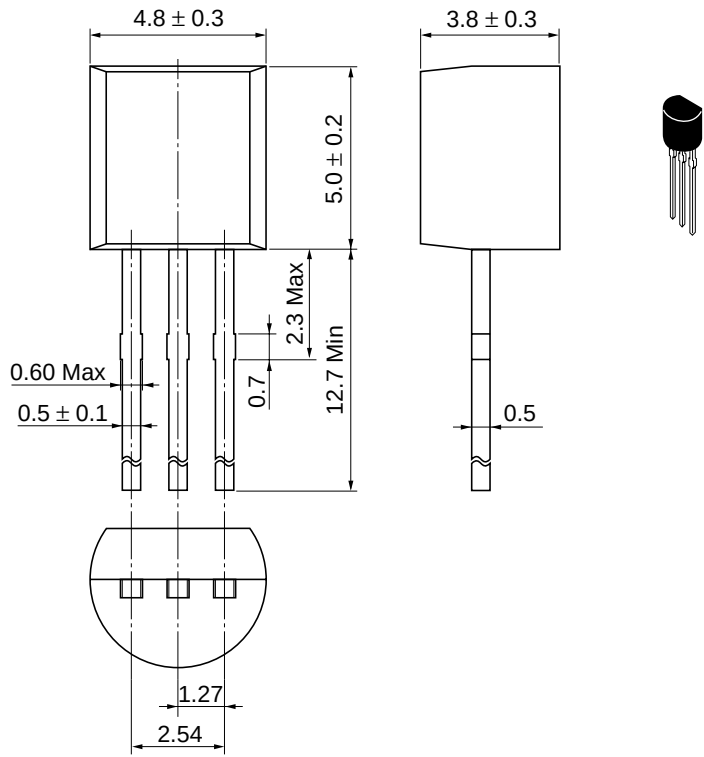
Gain Bandwidth Product vs. Collector Current



Switching Time vs. Collector Current



Unit: mm



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

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Hitachi, Ltd.
Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose,CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
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