
2SA778(K), 2SA778A(K)

Silicon PNP Epitaxial

HITACHI

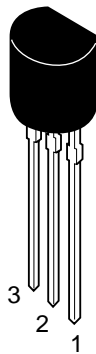
ADE-208-314 (Z)
1st. Edition
Mar. 2001

Application

High voltage medium speed switching

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

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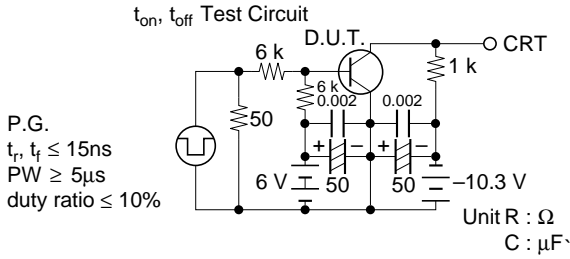
Absolute Maximum Ratings (Ta = 25°C)

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

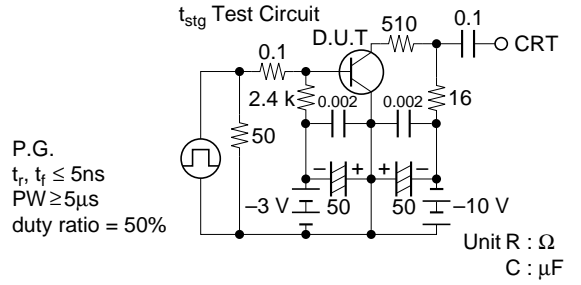
Electrical Characteristics (Ta = 25°C)

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	$V_{CC} = -10 V, I_C = -17 mA, I_{B1} = -1 mA, I_{B2} = -12 mA$

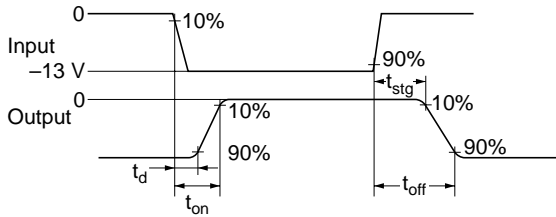
Switching Time Test Circuit



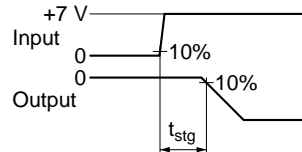
Switching Time Test Circuit



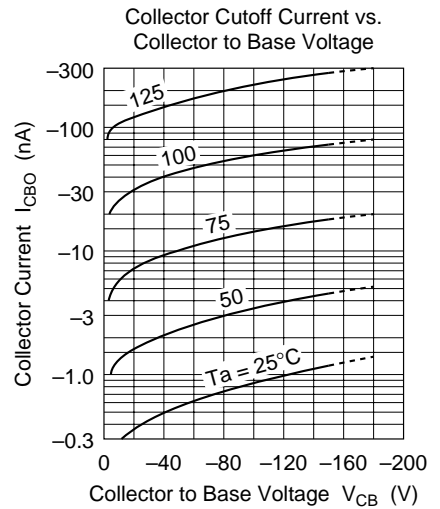
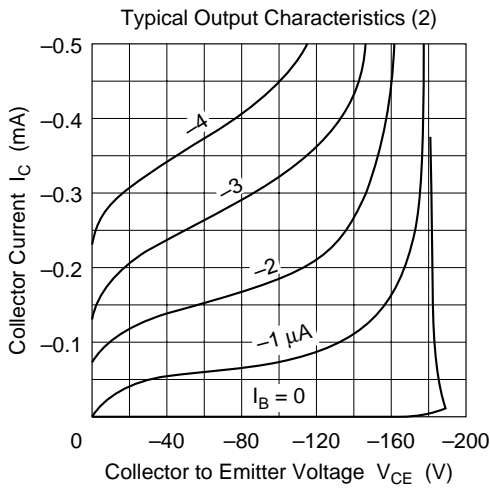
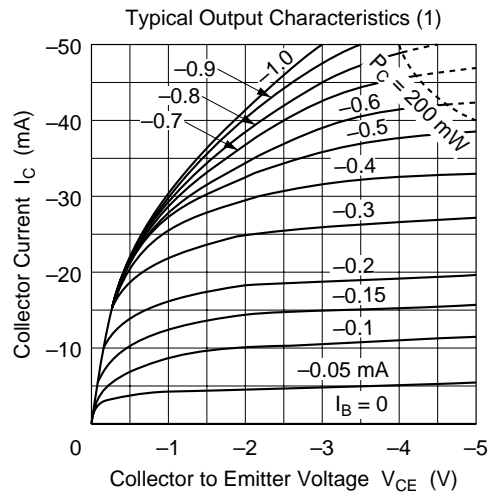
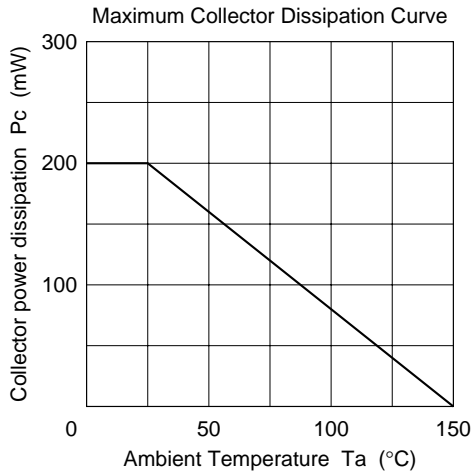
Response Waveform



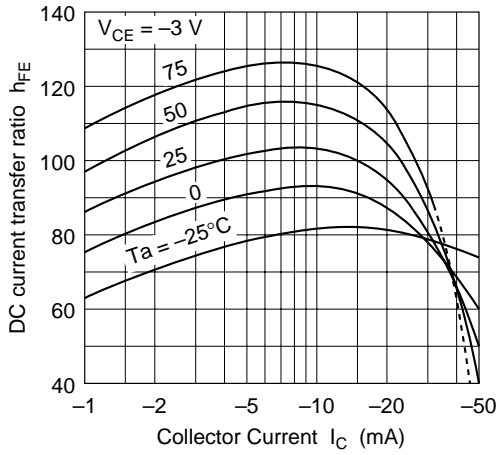
Response Waveform



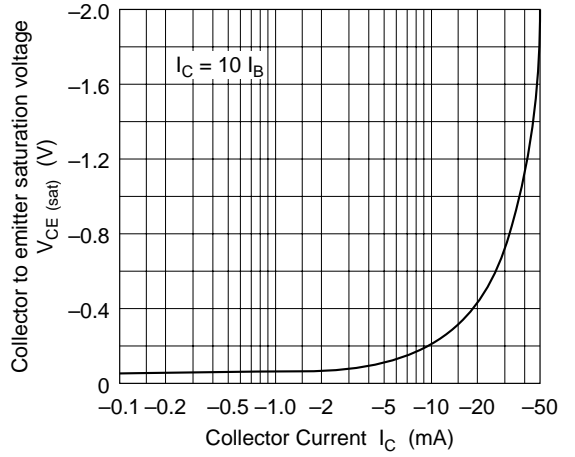
2SA778(K), 2SA778A(K)



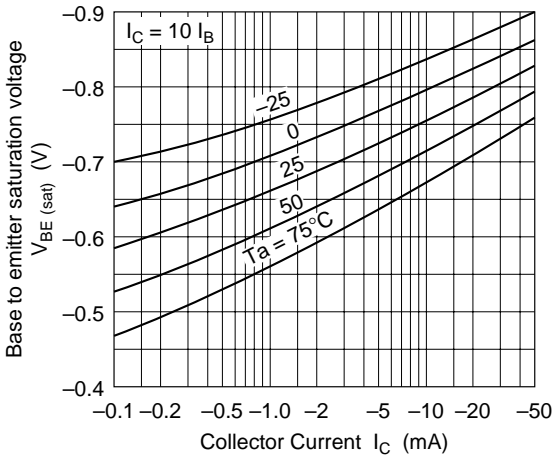
DC Current Transfer Ratio vs. Collector Current



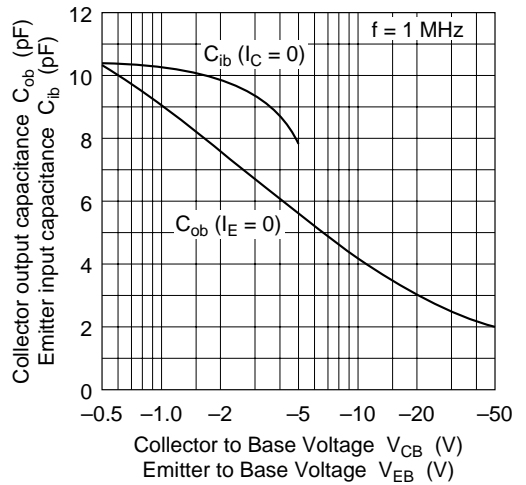
Collector to Emitter Saturation Voltage vs. Collector Current



Base to Emitter Saturation Voltage vs. Collector Current

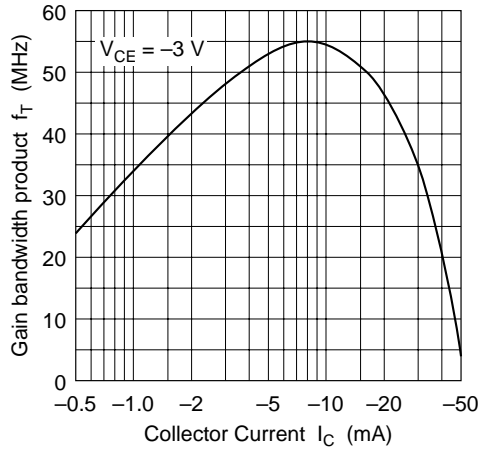


Input and Output Capacitance vs. Voltage

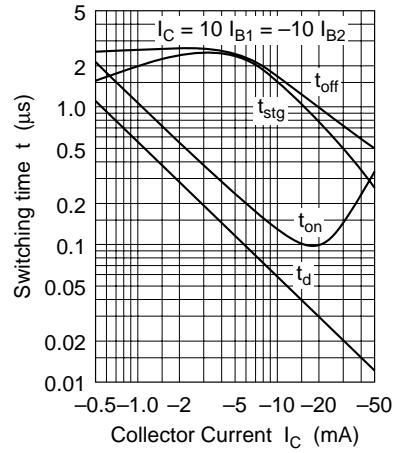


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Gain Bandwidth Product vs. Collector Current

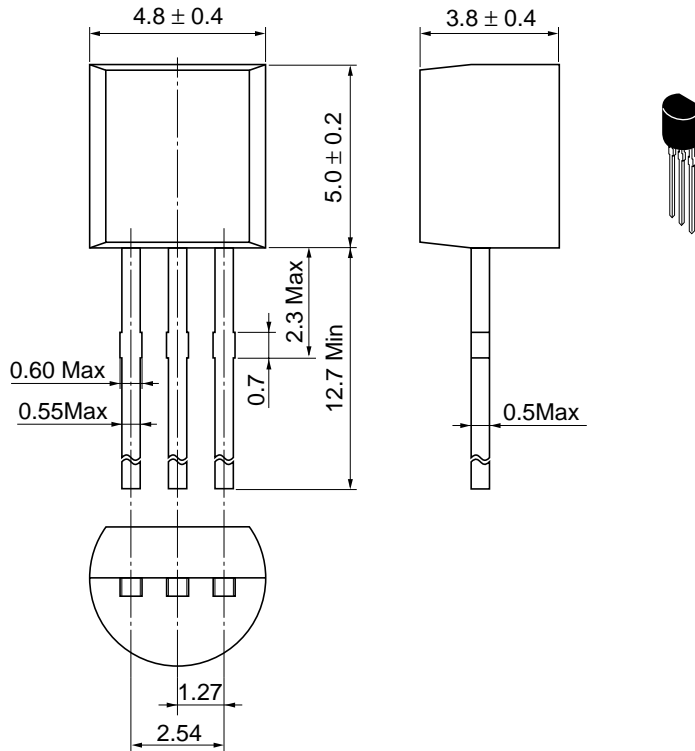


Switching Time vs. Collector Current



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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