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# 2SA778(K), 2SA778A(K)

Silicon PNP Epitaxial

# HITACHI

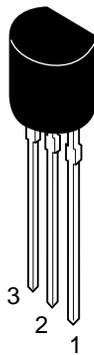
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## Application

High voltage medium speed switching

## Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

## 2SA778(K), 2SA778A(K)

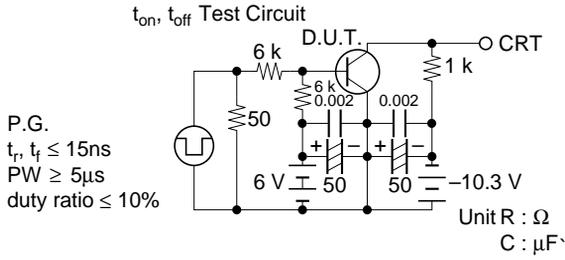
### Absolute Maximum Ratings (Ta = 25°C)

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

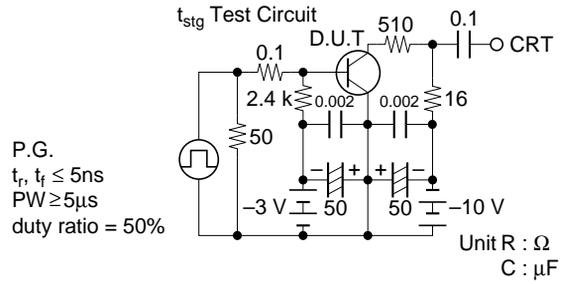
### Electrical Characteristics (Ta = 25°C)

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	—	—	—	$\mu A$	$V_{CB} = -100 V, I_E = 0$
		—	—	—	—	—	-1.0	$\mu A$	$V_{CB} = -150 V, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	-1.0	—	—	-1.0	$\mu A$	$V_{EB} = -5 V, I_C = 0$
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	—	$\mu s$	$I_C = 10 I_{B1} = -10 I_{B2} = -10 mA$
Storage time	$t_{stg}$	—	—	1.0	—	—	1.0	$\mu s$	$V_{CC} = -10 V, I_C = -17 mA, I_{B1} = -1 mA, I_{B2} = -12 mA$

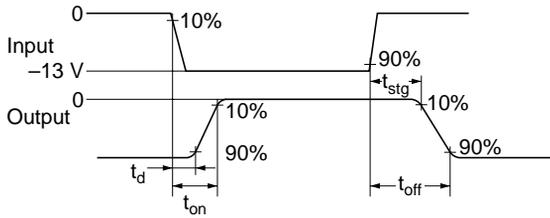
Switching Time Test Circuit



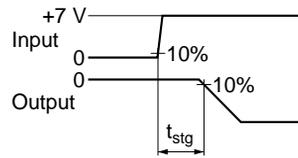
Switching Time Test Circuit



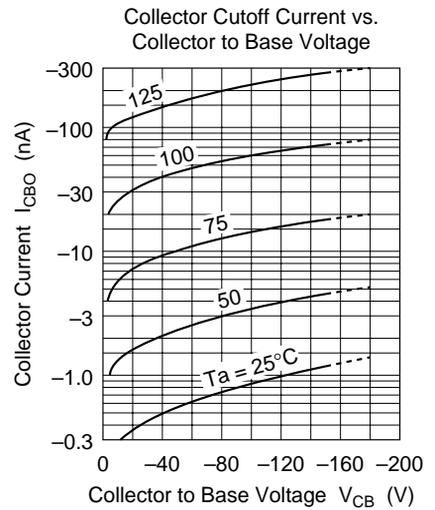
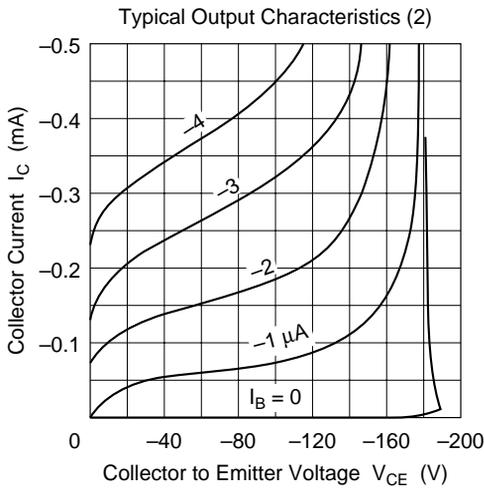
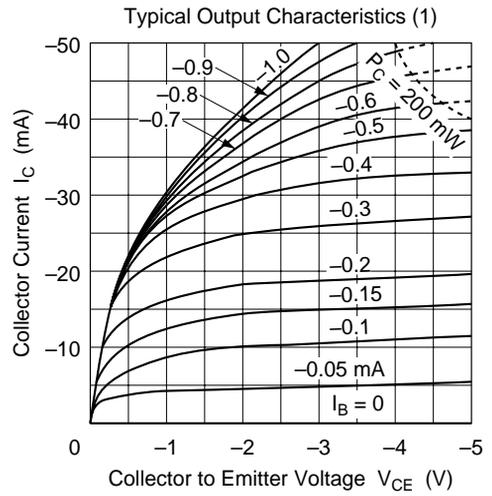
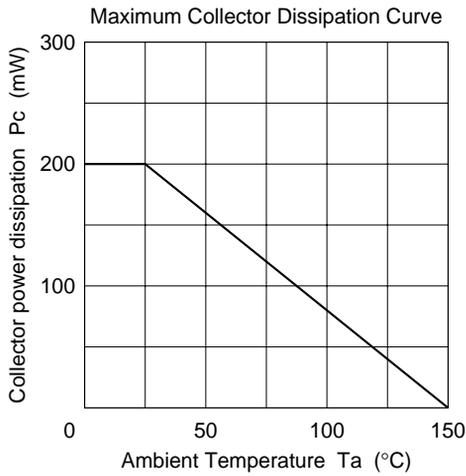
Response Waveform

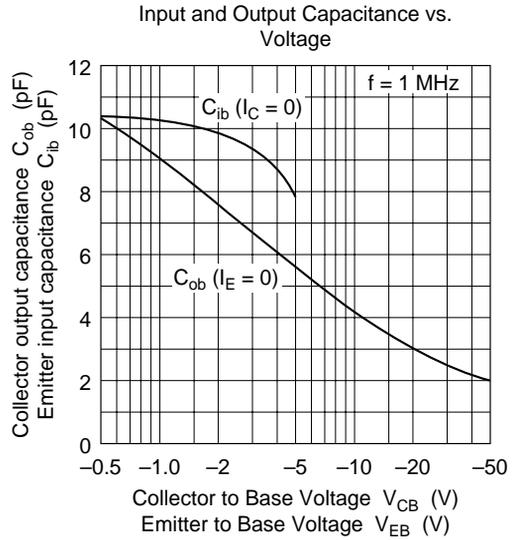
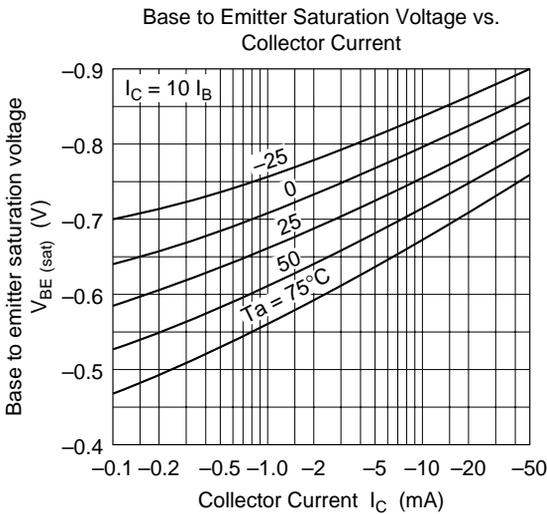
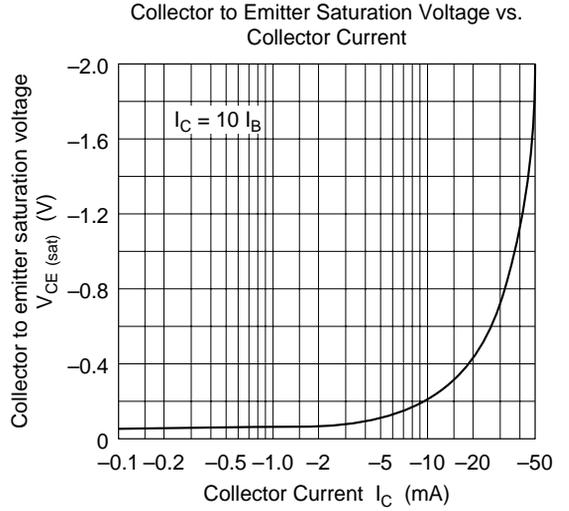
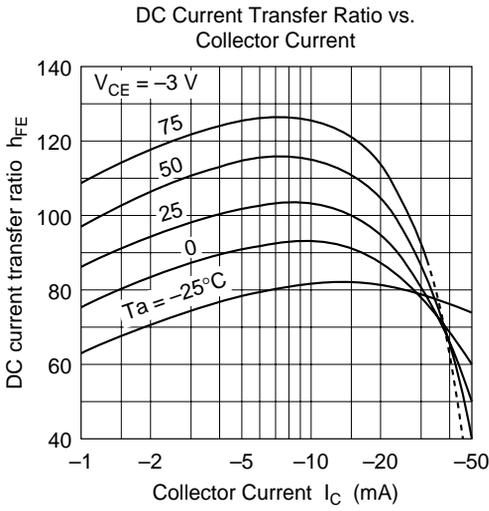


Response Waveform



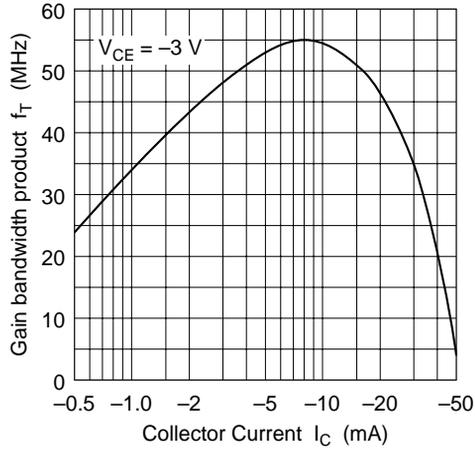
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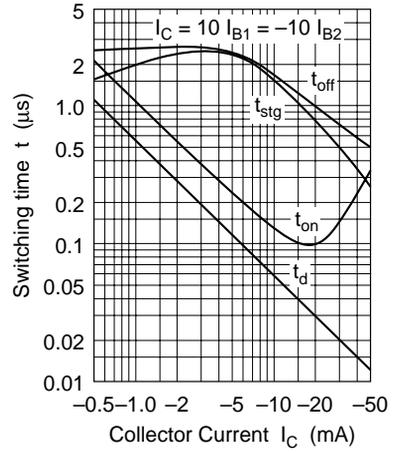


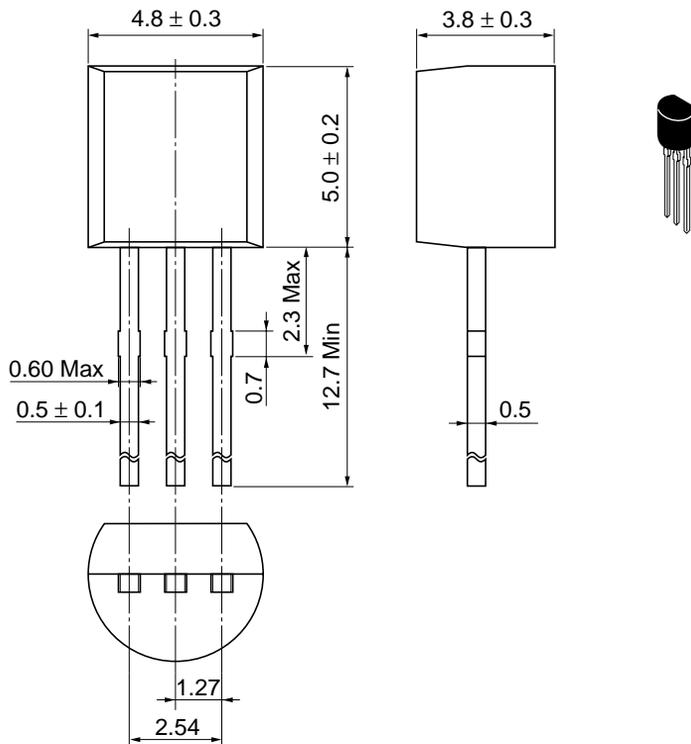
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Gain Bandwidth Product vs. Collector Current



Switching Time vs. Collector Current





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

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