
2SC1213A(K)

Silicon NPN Epitaxial

HITACHI

Application

- Low frequency amplifier
- Medium speed switching

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

2SC1213A (K)

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	50	V
Collector to emitter voltage	V_{CEO}	50	V
Emitter to base voltage	V_{EBO}	4	V
Collector current	I_C	500	mA
Collector power dissipation	P_C	400	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Electrical Characteristics (Ta = 25°C)

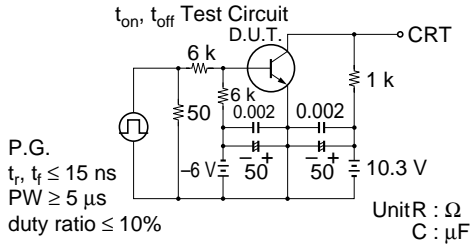
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	50	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	50	—	—	V	$I_C = 1.0 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	4	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	I_{CBO}	—	—	0.5	μA	$V_{CB} = 20 \text{ V}, I_E = 0$
DC current transfer ratio	h_{FE}^{*1}	60	—	320		$V_{CE} = 3 \text{ V}, I_C = 10 \text{ mA}$
	h_{FE}	10	—	—		$V_{CE} = 3 \text{ V}, I_C = 500 \text{ mA}^{*2}$
Base to emitter voltage	V_{BE}		0.64	—	V	$V_{CE} = 3 \text{ V}, I_C = 10 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	0.12	0.6	V	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}^{*2}$
Base to emitter saturation voltage	$V_{BE(sat)}$	—	0.83	1.2	V	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}^{*2}$
Collector output capacitance	C_{ob}	—	7.0	—	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Gain bandwidth product	f_T	—	120	—	MHz	$V_{CE} = 3 \text{ V}, I_C = 10 \text{ mA}$
Turn on time	t_{on}	—	0.25	—	μS	$V_{CC} = 10.3 \text{ V}$ $I_C = 10 \text{ mA}, I_{B1} = -10 \text{ mA}, I_{B2} = 10 \text{ mA}$
Turn off time	t_{off}	—	0.85	—	μS	
Storage time	t_{stg}	—	0.4	—	μS	$V_{CC} = 5 \text{ V}$ $I_C = I_{B1} = -I_{B2} = 20 \text{ mA}$

Notes: 1. The 2SC1213A(K) is grouped by h_{FE} as follows.

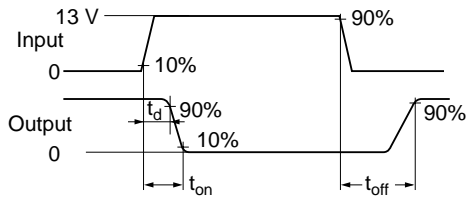
2. Pulse test

B	C	D
60 to 120	100 to 200	160 to 320

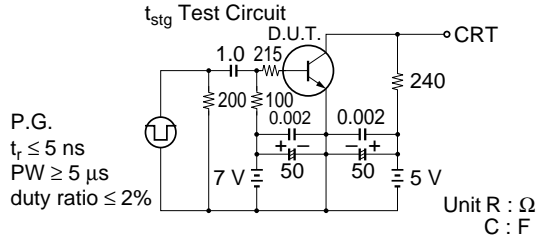
Switching Time Test Circuit



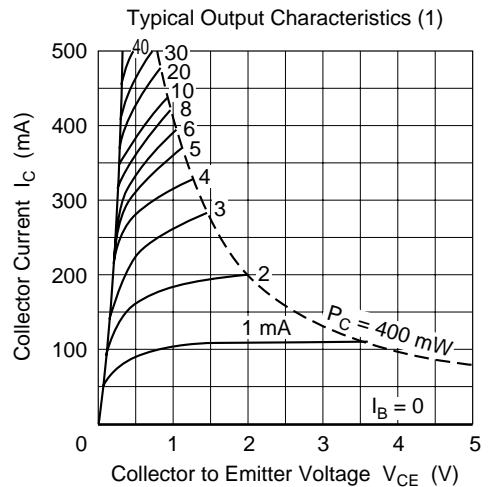
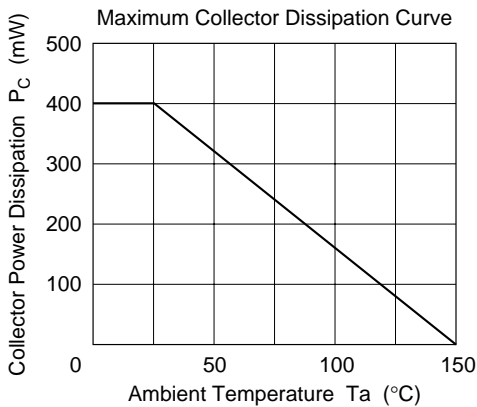
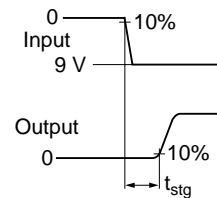
Response Waveform

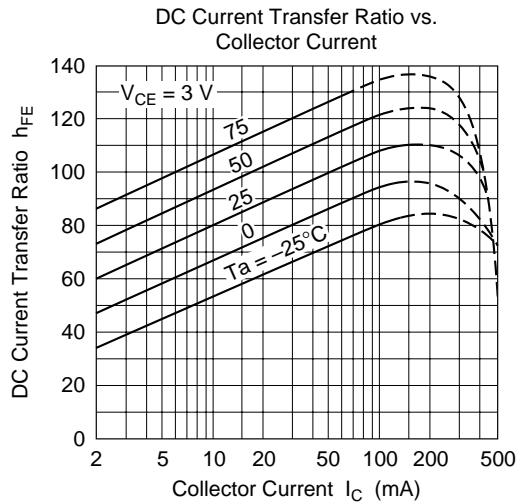
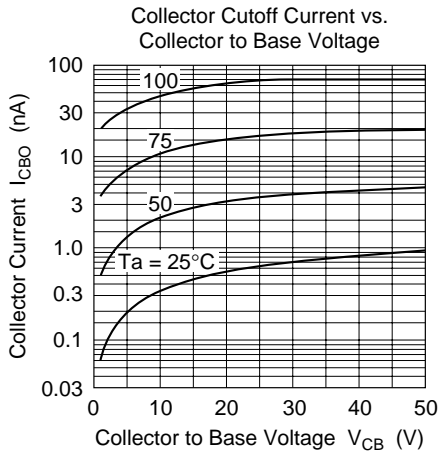
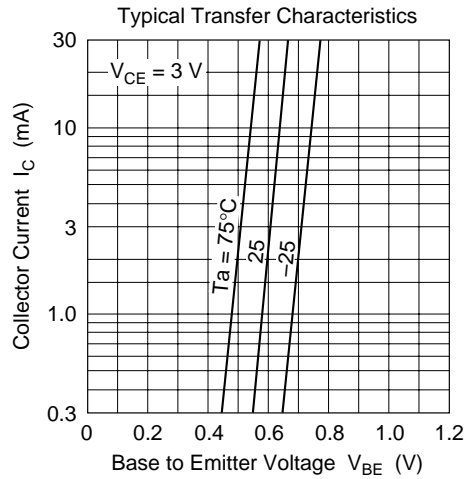
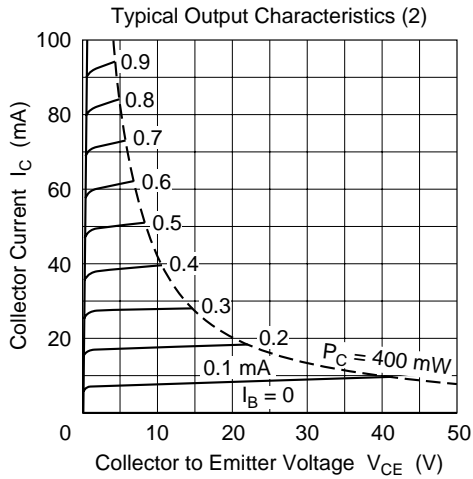


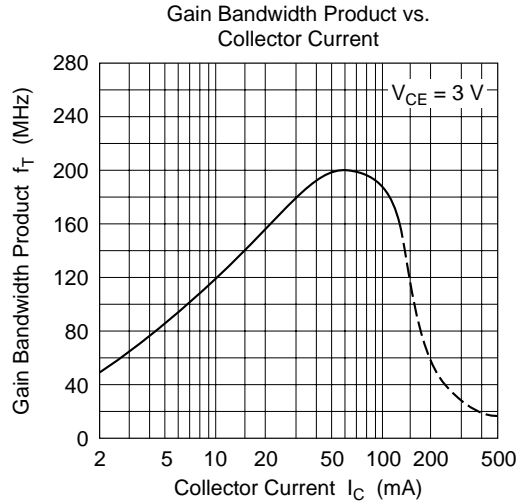
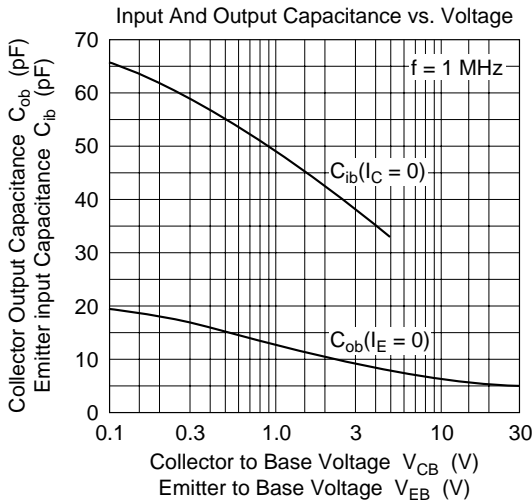
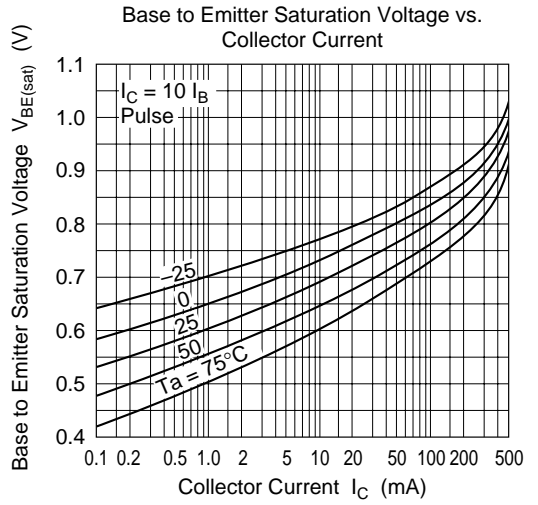
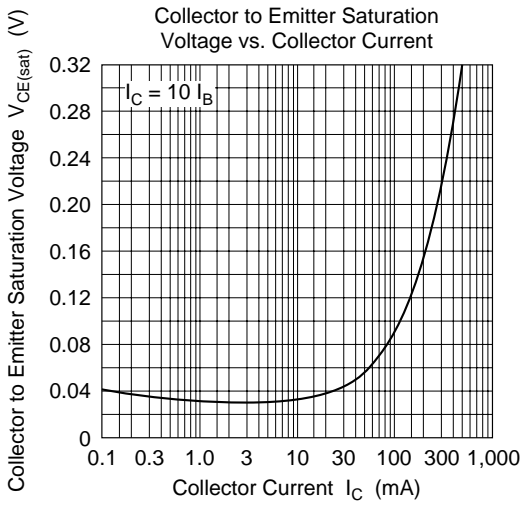
Switching Time Test Circuit

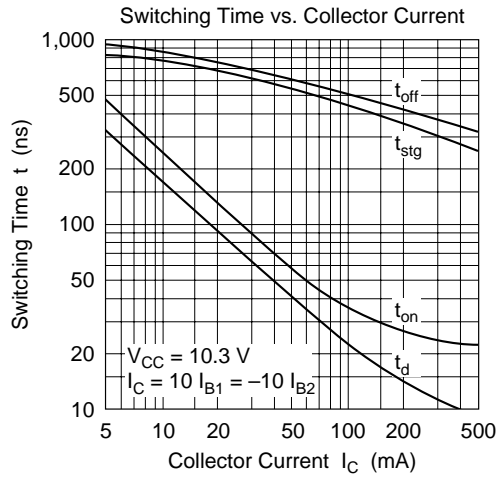


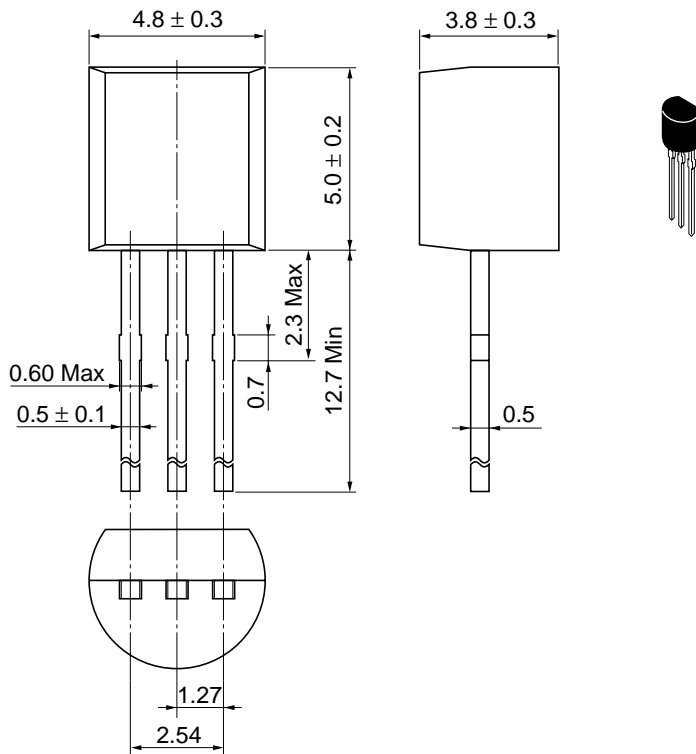
Response Waveform











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

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