

## SWITCHING REGULATOR APPLICATIONS

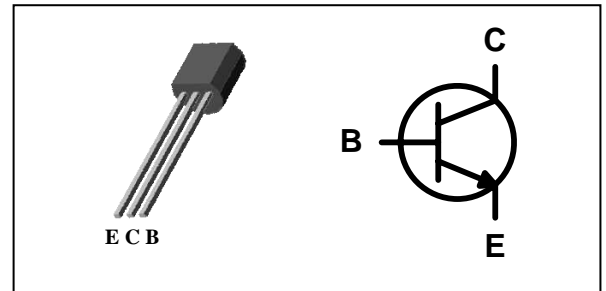
### Features

- High speed switching
- $V_{CEO(sus)} = 400V$
- Suitable for Switching Regulator and Motor Control

### Ordering Information

Type NO.	Marking	Package Code
STD13003Q	STD13003	TO-92

### PIN Connection



### Absolute Maximum Ratings

(Ta=25°C)

Characteristic	Symbol	Ratings	Unit
Collector-base voltage	$V_{CBO}$	700	V
Collector-emitter voltage	$V_{CEO}$	400	V
Emitter-base voltage	$V_{EBO}$	9	V
Collector current (DC)	$I_C$	1.5	A
Collector current (Pulse)	$I_{CP}$	3	A
Base current (DC)	$I_B$	0.75	A
Collector power dissipation	$P_C$	1.1	W
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55~150	°C

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-ambient	$R_{th(J-a)}$	-	113.6	°C/W

## Electrical Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-emitter sustaining voltage	$V_{CE(sus)}$	$I_C=5mA, I_B=0$	400	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB}=700V, I_E=0$	-	-	10	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=9V, I_C=0$	-	-	10	$\mu A$
DC current gain	$h_{FE}^*$	$I_C=0.5A, V_{CE}=2V$	15	-	35	
		$I_C=1A, V_{CE}=2V$	5	-	-	
Collector-emitter saturation voltage	$V_{CE(sat)}^*$	$I_C=0.5A, I_B=0.1A$	-	-	0.5	V
		$I_C=1A, I_B=0.25A$	-	-	1	
		$I_C=1.5A, I_B=0.5A$	-	-	3	
Base-emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=0.5A, I_B=0.1A$	-	-	1	V
		$I_C=1A, I_B=0.25A$	-	-	1.2	
Transition frequency	$f_T$	$V_{CB}=10V, I_C=0.1A, f=1MHz$	-	4	-	MHz
Output capacitance	$C_{ob}$	$V_{CB}=10V, I_E=0, f=0.1MHz$	-	13	-	pF
Turn on Time	$t_{on}$	<p style="font-size: small;"> <math>I_{BI} = -I_{B2} = 200mA</math>            DUTY CYCLE <math>\leq 1\%</math> </p>	-	1.1	-	$\mu S$
Storage Time	$t_{stg}$		-	4	-	
Fall Time	$t_f$		-	0.7	-	

\* Pulse test:  $PW \leq 300 \mu s$ , Duty cycle  $\leq 2\%$  Pulse

Electrical Characteristic Curves

Fig. 1  $P_C - T_a$

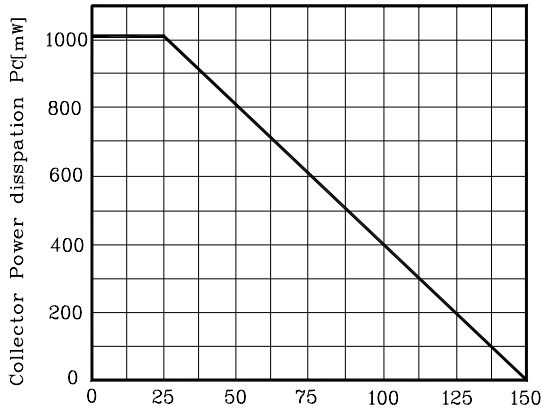


Fig. 2  $I_C - V_{CE}$

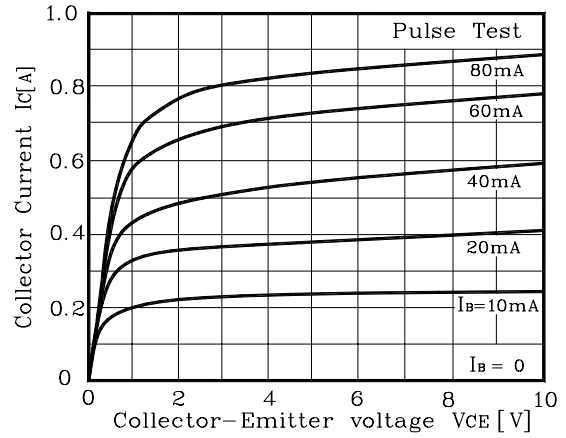


Fig. 3  $V_{CE(sat)} - I_C$

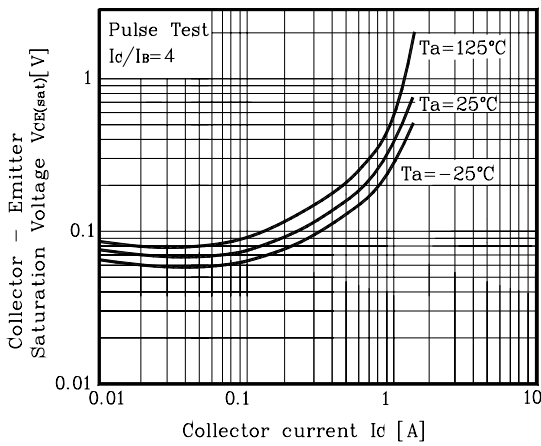


Fig. 4  $V_{BE(sat)} - I_C$

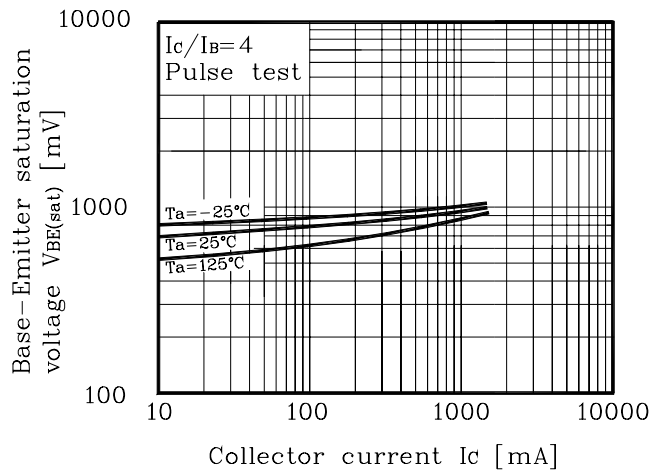


Fig. 5  $h_{FE} - I_C$

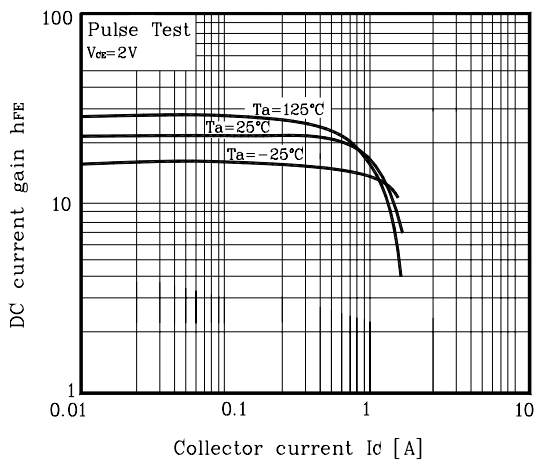
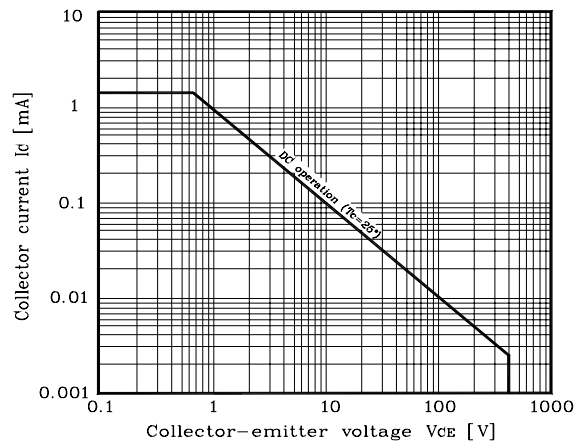


Fig. 6 Safe operating area



Electrical Characteristic Curves

Fig. 7 Turn on time

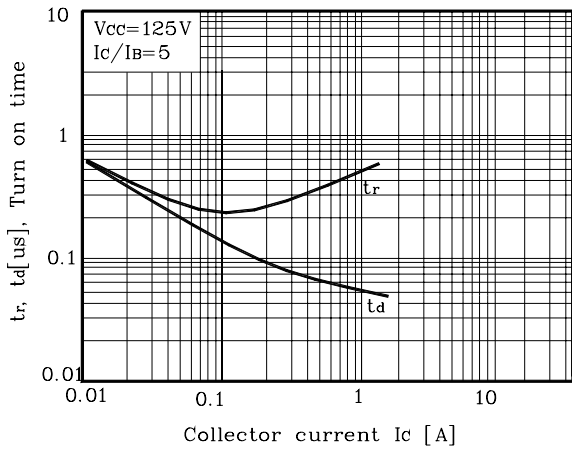
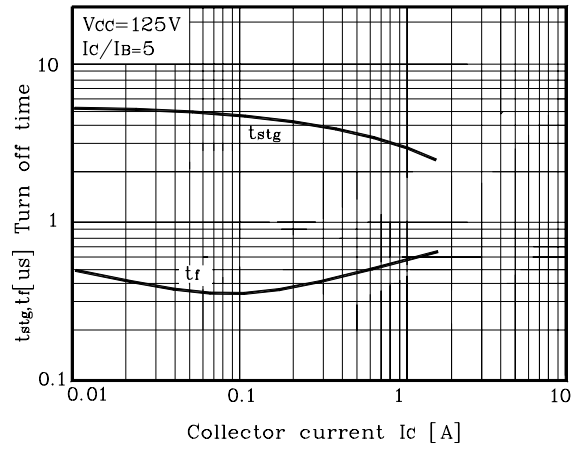
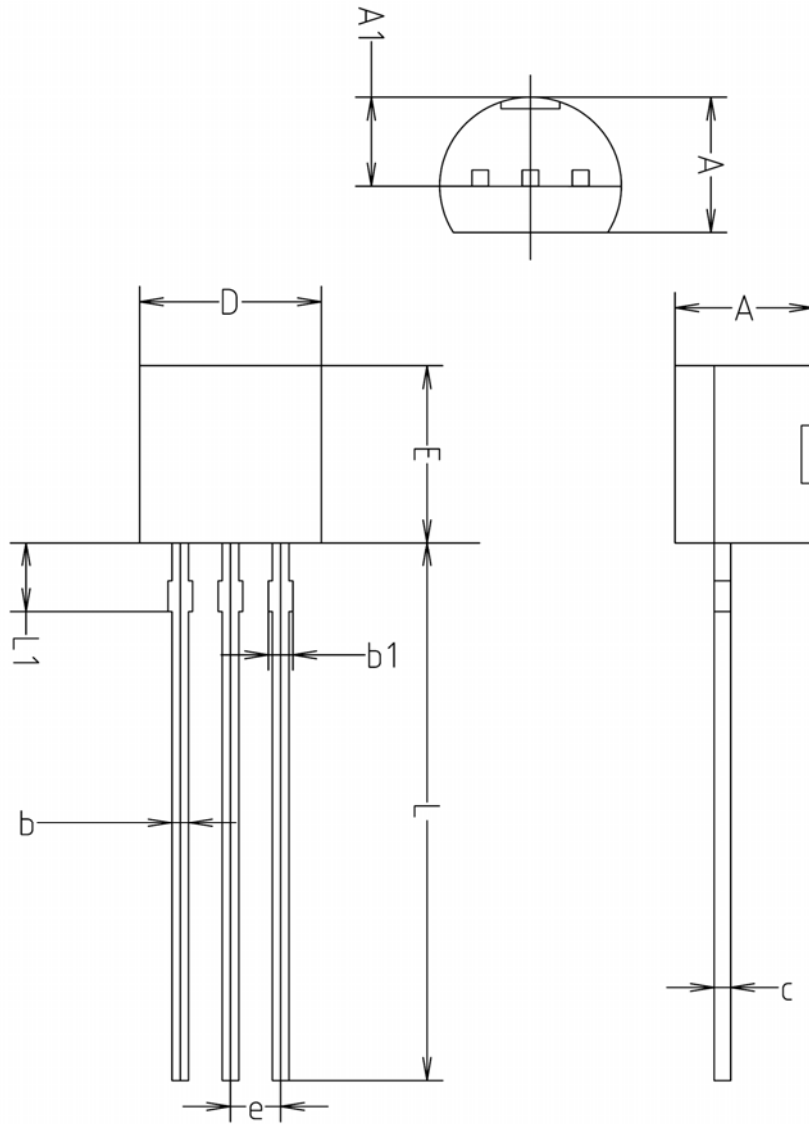


Fig. 8 Turn off time



Outline Dimension



SYMBOL	MILLMETERS(mm)		
	MINIMUM	NOMINAL	MAXIMUM
A	3.40	3.50	3.66
A1	2.46	2.51	2.59
b	0.39	0.44	0.53
b1	0.39	—	0.63
c	0.35	0.42	0.47
D	4.48	4.60	4.70
E	4.48	4.60	4.70
e	1.17	1.27	1.37
L	13.70	14.00	14.77
L1	1.55	1.70	2.15

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