

## SWITCHING REGULATOR APPLICATIONS

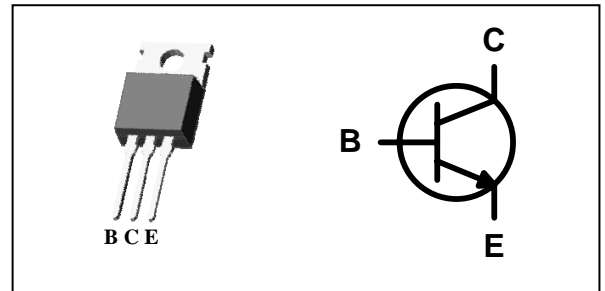
### Features

- High speed switching
- High Collector Voltage :  $V_{CBO} = 700V$
- Suitable for Switching Regulator and Motor Control

### Ordering Information

Type NO.	Marking	Package Code
STD13007	STD13007	TO-220AB

### PIN Connection



### Absolute maximum ratings

(Ta=25°C)

Characteristic	Symbol	Rating	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)	$I_C$	8	A
Collector current (Pulse)	$I_{CM}$	16	A
Base current (DC)	$I_B$	4	A
Collector Power dissipation (Tc=25°C)	$P_C$	80	W
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 ~ 150	°C

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	1.56	°C/W
	Junction-ambient	$R_{th(J-a)}$	-	83.3	

## Electrical Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Emitter sustaining voltage	$BV_{CEO(sus)}$	$I_C=10mA, I_B=0$	400	-	-	V
Emitter cut-off current	$I_{EBO}$	$V_{EB}=9V, I_C=0$	-	-	1	mA
DC Current gain	$h_{FE}^*$	$I_C=2A, V_{CE}=5V^*$	10	-	45	
		$I_C=5A, V_{CE}=5V$	5	-	30	
Collector-Emitter saturation voltage	$V_{CE(sat)}^*$	$I_C=2A, I_B=0.4A$	-	-	1	V
		$I_C=5A, I_B=1A$	-	-	2	
		$I_C=8A, I_B=2A$	-	-	3	
Base-Emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=2A, I_B=0.4A$	-	-	1.2	V
		$I_C=5A, I_B=1A$	-	-	1.6	
Transition frequency	$f_T$	$V_{CE}=10V, I_C=0.5A, f=1MHz$	-	14	-	MHz
Output capacitance	$C_{ob}$	$V_{CB}=10V, I_E=0, f=0.1MHz$	-	80	-	pF
Turn on Time	$t_{on}$	$V_{CC}=125V, I_C=5A$ $I_{B1}=-I_{B2}=1A$	-	1.6	-	$\mu s$
Storage Time	$t_{stg}$		-	3	-	
Fall Time	$t_f$		-	0.7	-	

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

\*  $h_{FE}$  rank / A : 10~30, B : 25~45

Electrical Characteristic Curves

Fig. 1  $P_C - T_C$

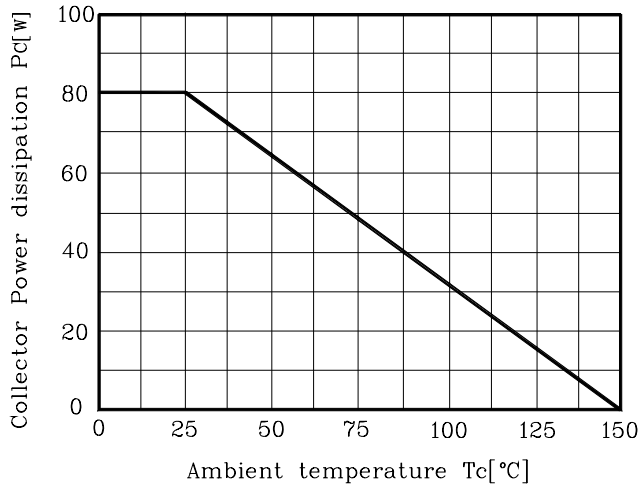


Fig. 2  $V_{BE(sat)}, V_{CE(sat)} - I_C$

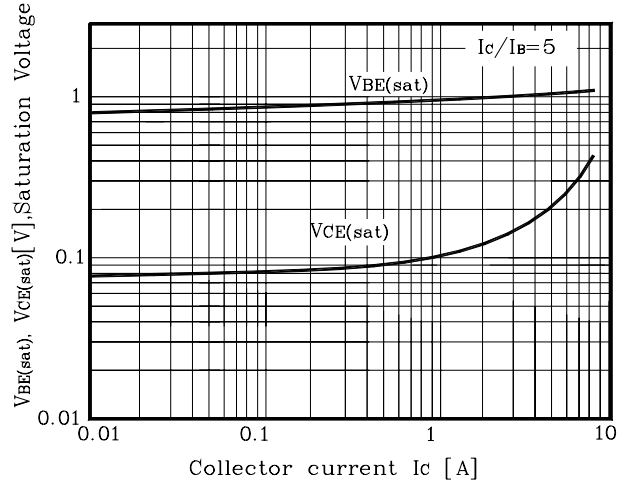


Fig. 3  $h_{FE} - I_C$

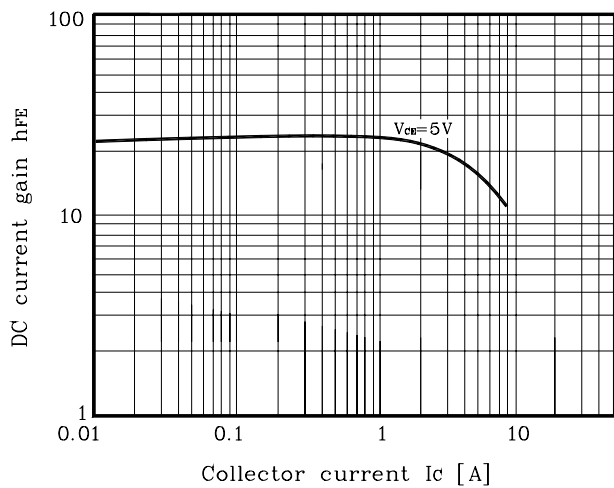


Fig. 4  $t_r, t_{stg} - I_C$

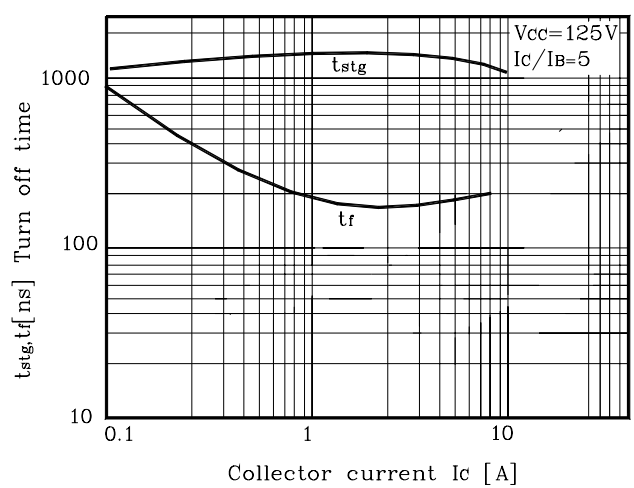


Fig. 5  $t_d, t_r - I_C$

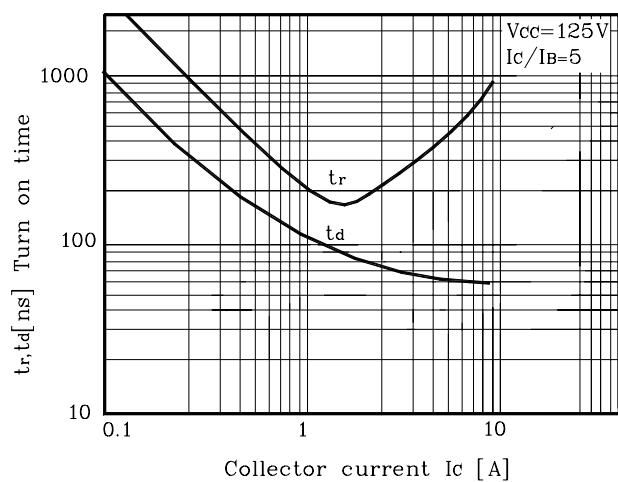
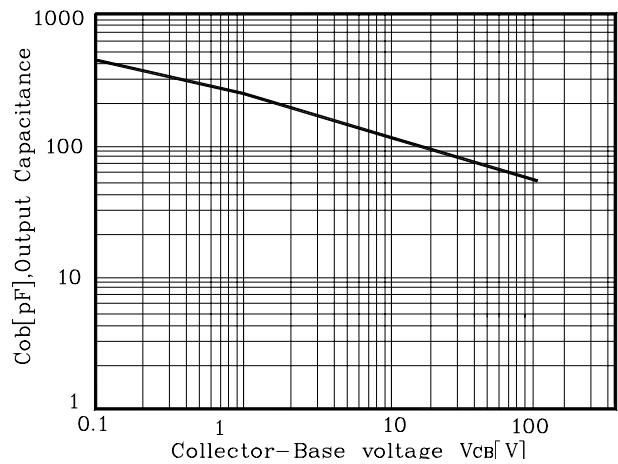
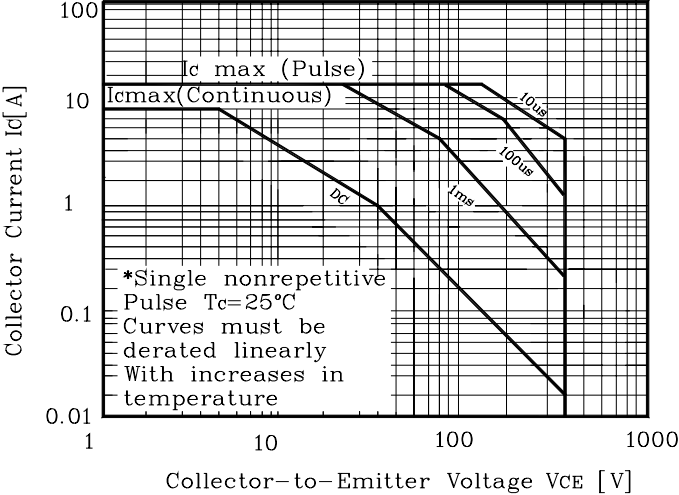


Fig. 6  $C_{ob} - V_{CB}$

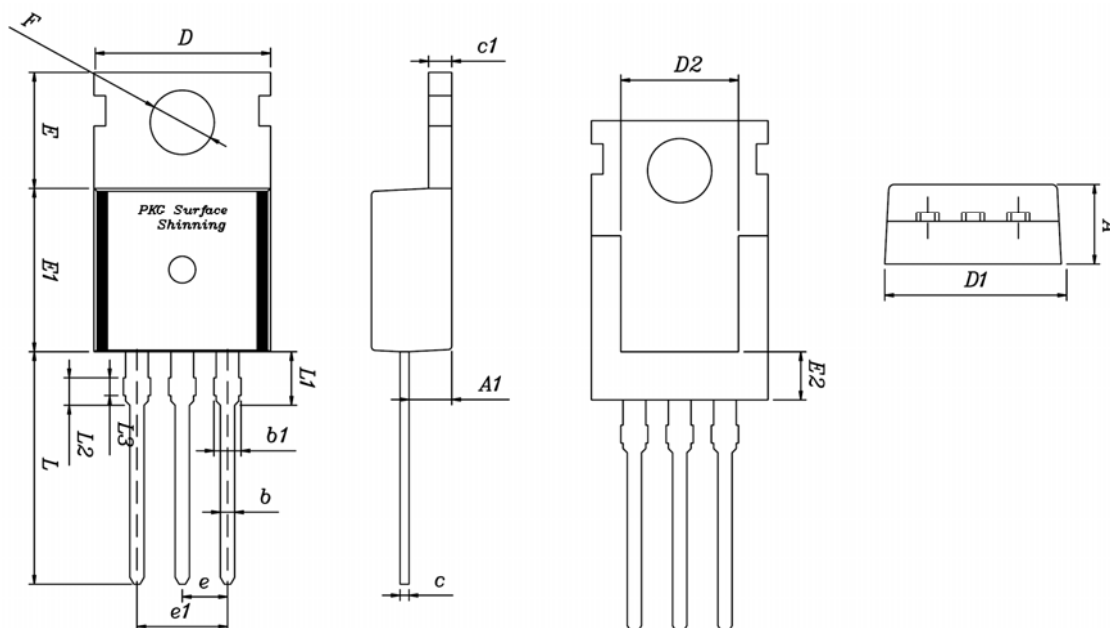


# Electrical Characteristic Curves

Fig. 7 Safe Operating Area



## Outline Dimension



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	4.35	4.50	4.65	
A1	2.20	2.40	2.60	
b	0.65	0.80	0.95	
b1	1.42	1.52	1.62	
C	0.40	0.50	0.60	
C1	1.20	1.30	1.40	
D	9.80	10.00	10.20	
D1	9.85	10.00	10.15	
D2	6.40	6.60	6.80	
E	6.30	6.50	6.70	
E1	9.05	9.20	9.35	
E2	2.50	2.70	2.90	
F	3.50	3.60	3.70	
e	2.34	2.54	2.64	
e1	4.88	5.08	5.28	
L	12.68	13.08	13.48	
L1	2.80	3.00	3.20	
L2	1.49	1.54	1.59	
L3	0.95	1.00	1.05	

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