

SWITCHING REGULATOR APPLICATIONS

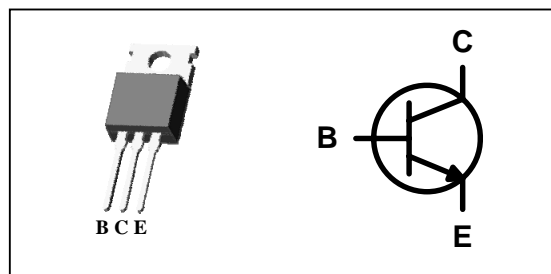
Features

- 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

($T_a = 25^\circ C$)

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 ($T_c = 25^\circ C$)	P_C	80	W
Junction temperature	T_j	150	$^\circ C$
Storage temperature	T_{stg}	-55 ~ 150	$^\circ C$

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	1.56	$^\circ C/W$
	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	-	μs
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 $P_C - T_C$

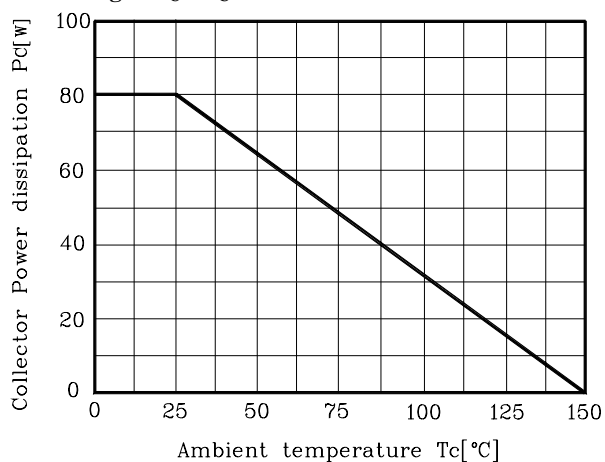


Fig. 2 $V_{BE(sat)}, V_{CE(sat)} - I_C$

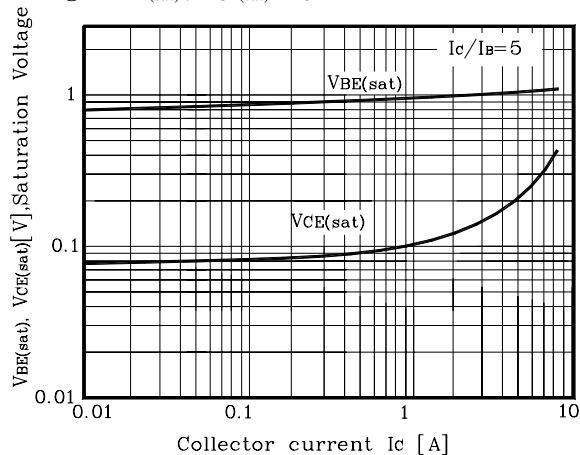


Fig. 3 $h_{FE} - I_C$

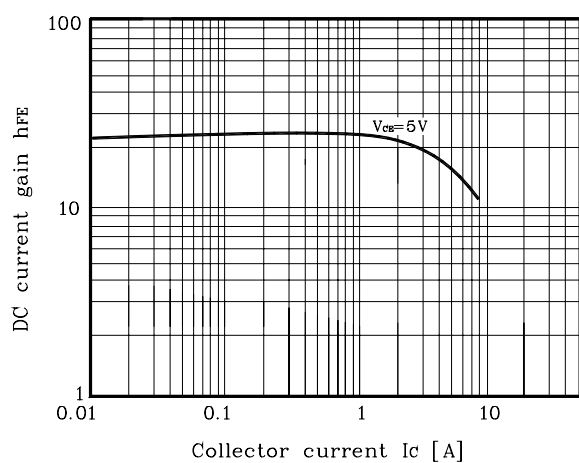


Fig. 4 $t_f, t_{stg} - I_C$

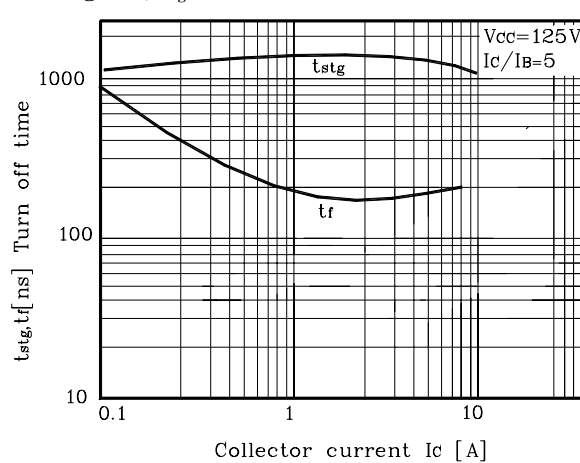


Fig. 5 $t_d, t_r - I_C$

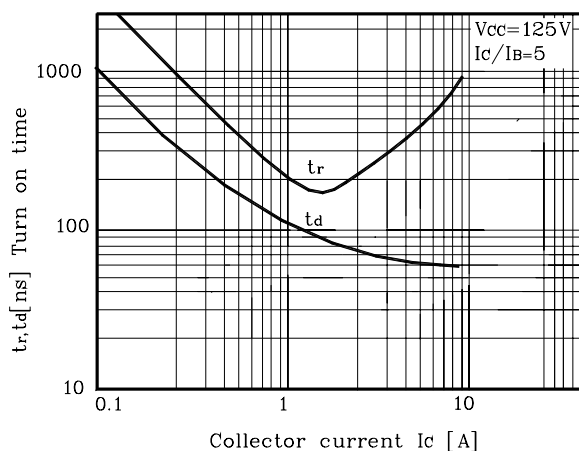
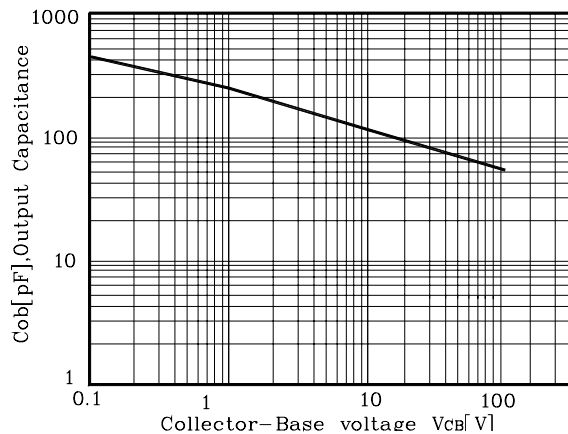
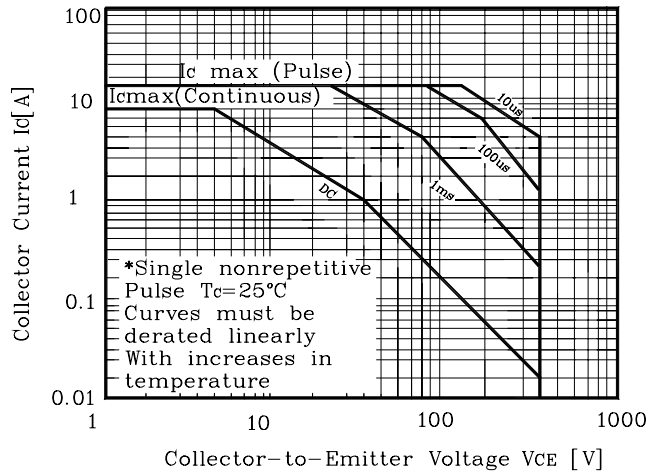


Fig. 6 $C_{ob} - V_{CB}$

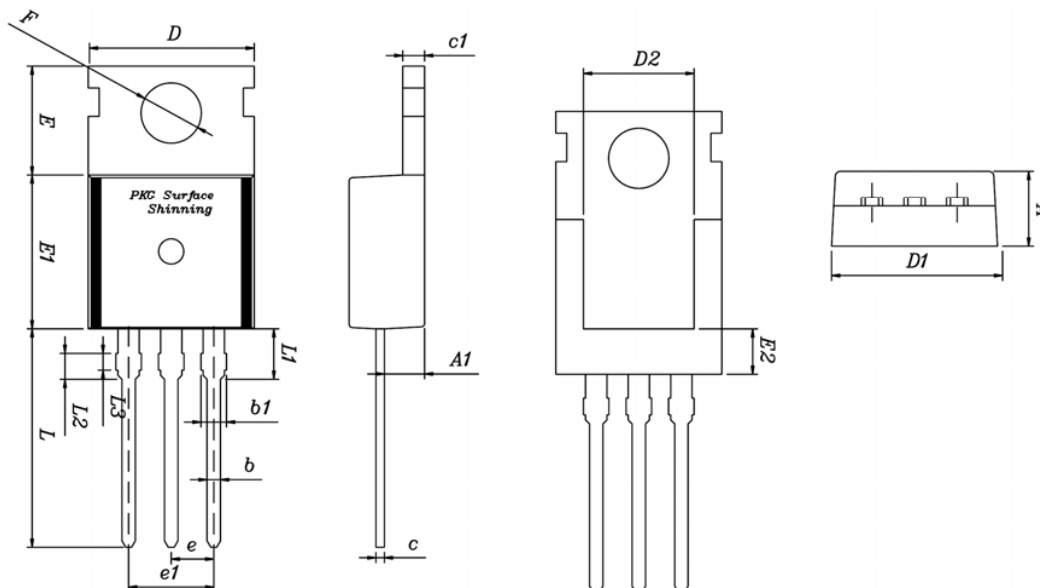


Electrical Characteristic Curves

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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