

**Features**

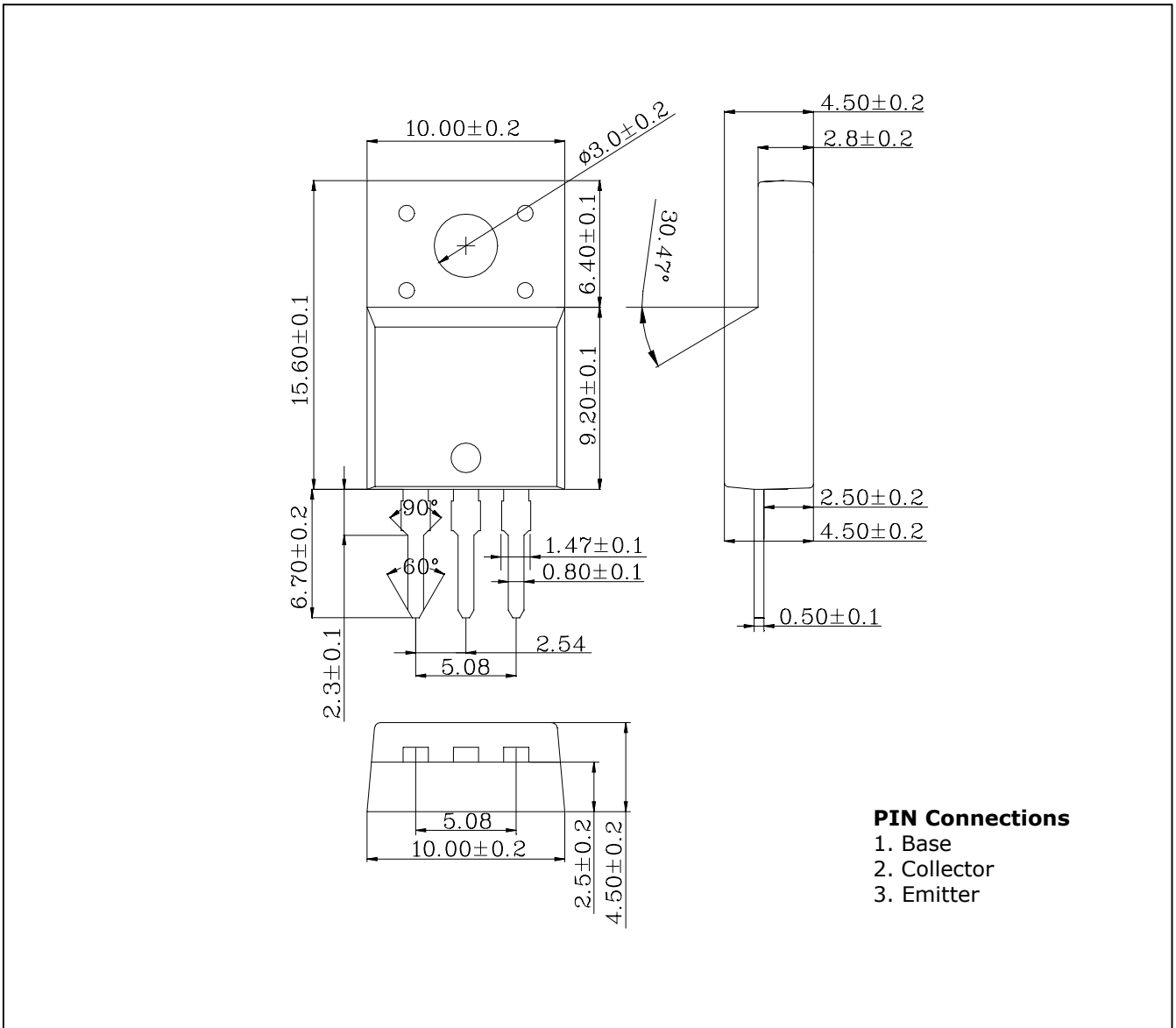
- High speed switching
- VCEO(sus)=400V
- Suitable for Switching Regulator and Motor Control

**Ordering Information**

Type NO.	Marking	Package Code
STD13005FC	STD13005	TO-220F-3SL

**Outline Dimensions**

unit : mm



## Absolute maximum ratings

(Tc=25°C)

Characteristic	Symbol	Ratings	Unit
Collector-Base voltage	V <sub>CBO</sub>	700	V
Collector-Emitter voltage	V <sub>CEO</sub>	400	V
Emitter-base voltage	V <sub>EBO</sub>	9	V
Collector current (DC)	I <sub>C</sub>	4	A
Collector current (Pulse)	I <sub>CM</sub>	8	A
Base current (DC)	I <sub>B</sub>	2	A
Base current (Pulse)	I <sub>BM</sub>	4	A
Total Power dissipation (Tc=25°C)	P <sub>D</sub>	30	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55~150	°C

## Electrical Characteristics

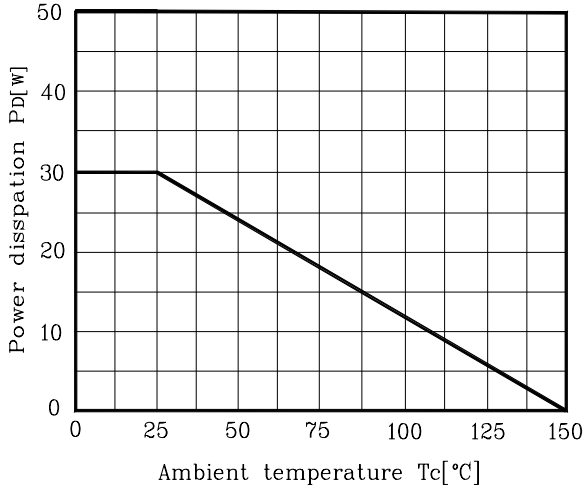
(Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Emitter sustaining voltage	V <sub>CE(sus)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	400	-	-	V
Collector cut-off current	I <sub>CEV</sub>	V <sub>CEV</sub> =Rated Value V <sub>BE(off)</sub> =1.5V	-	-	1	mA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =9V, I <sub>C</sub> =0	-	-	1	mA
DC Current gain	h <sub>FE</sub> *	I <sub>C</sub> =1A, V <sub>CE</sub> =5V	10	-	60	
		I <sub>C</sub> =2A, V <sub>CE</sub> =5V	8	-	40	
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub> *	I <sub>C</sub> =1A, I <sub>B</sub> =0.2A	-	-	0.5	V
		I <sub>C</sub> =2A, I <sub>B</sub> =0.5A	-	-	0.6	
		I <sub>C</sub> =4A, I <sub>B</sub> =1A	-	-	1	
Base-Emitter saturation voltage	V <sub>BE(sat)</sub> *	I <sub>C</sub> =1A, I <sub>B</sub> =0.2A	-	-	1.2	V
		I <sub>C</sub> =2A, I <sub>B</sub> =0.5A	-	-	1.6	
Transition frequency	f <sub>T</sub>	V <sub>CB</sub> =10V, I <sub>C</sub> =0.5A, f=1MHz	4	-	-	MHz
Output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=0.1MHz	-	65	-	pF
Turn on Time	t <sub>ON</sub>	V <sub>CC</sub> =125V, I <sub>C</sub> =2A, R <sub>L</sub> =62.5Ω I <sub>B1</sub> =-I <sub>B2</sub> =0.4A	-	-	0.8	μs
Storage Time	t <sub>STG</sub>		-	-	4	
Fall Time	t <sub>F</sub>		-	-	0.9	

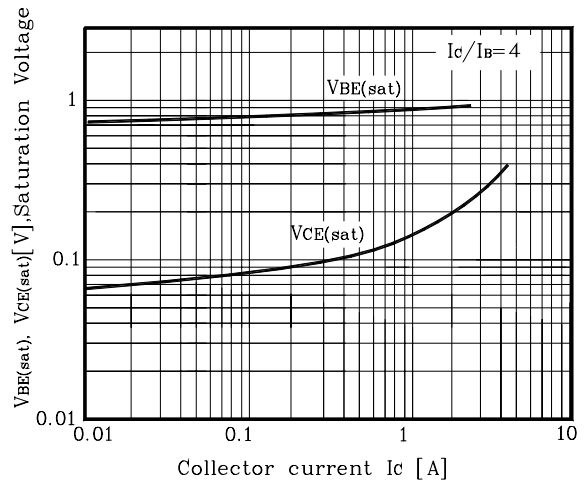
\* Pulse test: PW ≤ 300 μs, Duty cycle ≤ 2% Pulse

## Electrical Characteristic Curves

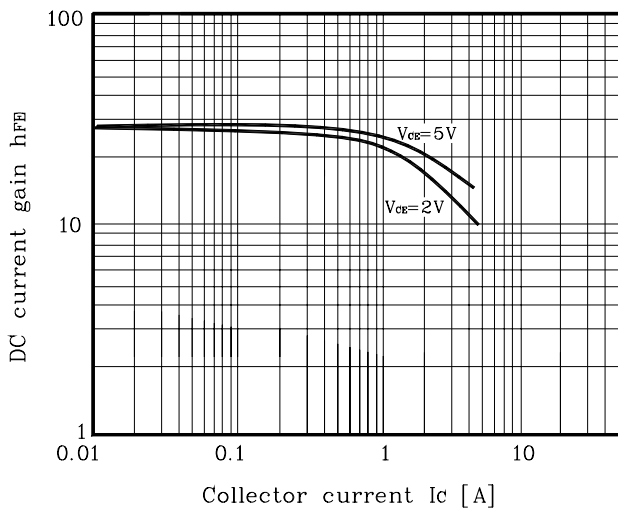
**Fig. 1  $P_D - T_C$**



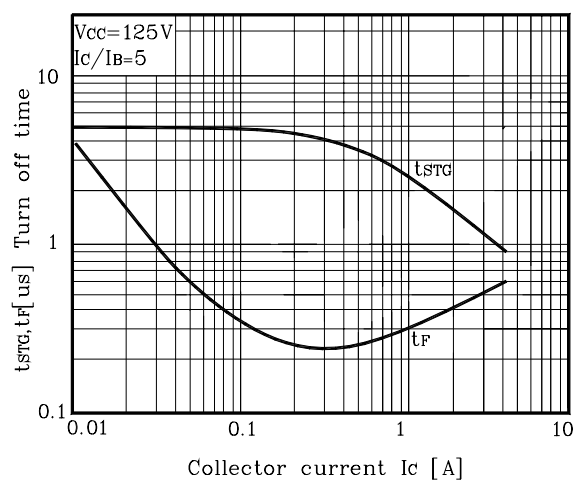
**Fig. 2  $V_{BE(sat)}, V_{CE(sat)} - I_C$**



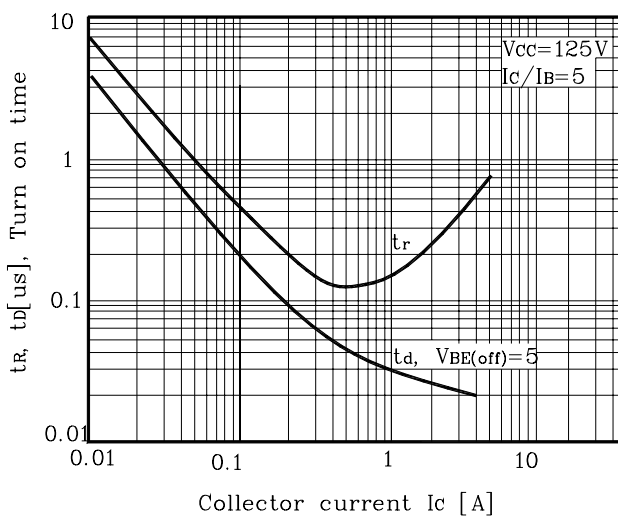
**Fig. 3  $h_{FE} - I_C$**



**Fig. 4 Turn off time**



**Fig. 5 Turn on time**



**Fig. 6 Capacitance**

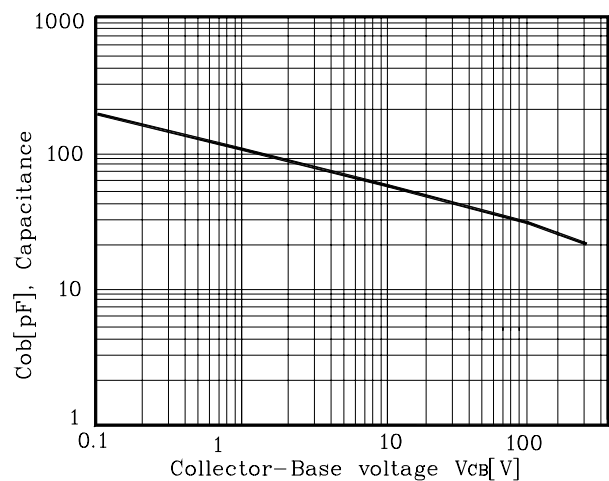


Fig. 7 Safe Operating Area

