Silicon NPN Power Transistors MJE13009

DESCRIPTION

·With TO-3PN package
·High voltage ,high speed

APPLICATIONS

·Particularly suited for 115V and 220V switchmode applications such as switching regulators,inverters ,motor controls,solenoid/ relay drivers and deflection circuits

PINNING

PIN	DESCRIPTION
1	Base
2	Collector;connected to mounting base
3	Emitter

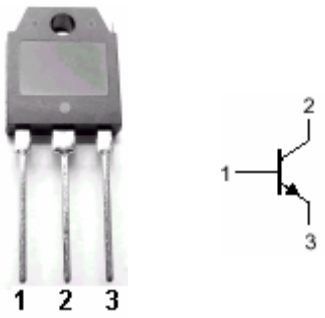

Fig.1 simplified outline (TO-3PN) and symbol

Absolute maximum ratings(Tc=25□)

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V_{CBO}	Collector-base voltage	Open emitter	700	V
V_{CEO}	Collector-emitter voltage	Open base	400	V
V_{EBO}	Emitter-base voltage	Open collector	9	V
I_C	Collector current (DC)		12	A
I_{CM}	Collector current-Peak		24	A
I_E	Emitter current		18	A
I_{EM}	Emitter current-Peak		36	A
I_B	Base current		6	A
I_{BM}	Base current-Peak		12	A
P_D	Total power dissipation	T_a=25□	2	W
		T_C=25□	100	
T_j	Junction temperature		150	□
T_{stg}	Storage temperature		-65~150	□

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}C}$	Thermal resistance from junction to case	1.25	□/W

CHARACTERISTICS

Tj=25□ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CEO(SUS)}$	Collector-emitter sustaining voltage	I_C=10mA; I_B=0	400			V
$V_{CEsat-1}$	Collector-emitter saturation voltage	I_C=5A; I_B=1A			1.0	V
$V_{CEsat-2}$	Collector-emitter saturation voltage	I_C=8A ;I_B=1.6A T_C=100□			1.5 2.0	V
$V_{CEsat-3}$	Collector-emitter saturation voltage	I_C=12A; I_B=3A			3.0	V
$V_{BEsat-1}$	Base-emitter saturation voltage	I_C=5A; I_B=1A			1.2	V
$V_{BEsat-2}$	Base-emitter saturation voltage	I_C=8A; I_B=1.6A T_C=100□			1.6 1.5	V
I_{CEV}	Collector cut-off current	V_{CEV}=Rated value, $V_{BE(off)}$=1.5V dc;T_C=100□			1.0 5.0	mA
I_{EBO}	Emitter cut-off current	V_{EB}=9V; I_C=0			1.0	mA
h_{FE-1}	DC current gain	I_C=5A ; V_{CE}=5V	8		40	
h_{FE-2}	DC current gain	I_C=8A ; V_{CE}=5V	6		30	
f_T	Transition frequency	I_C=0.5A ; V_{CE}=10V;f=1MHz	4			MHz
C_{OB}	Collector outoput capacitance	I_E=0; f=0.1MHz ; V_{CB}=10V		180		pF

Switching times resistive load

t_d	Delay time	V_{CC}=125V ,I_C=8A I_{B1}=-I_{B2}=1.6A t_p=25μs duty cycle≤1%		0.06	0.1	μs
t_r	Rise time			0.45	1.0	μs
t_s	Storage time			1.30	3.0	μs
t_f	Fall time			0.20	0.7	μs

PACKAGE OUTLINE

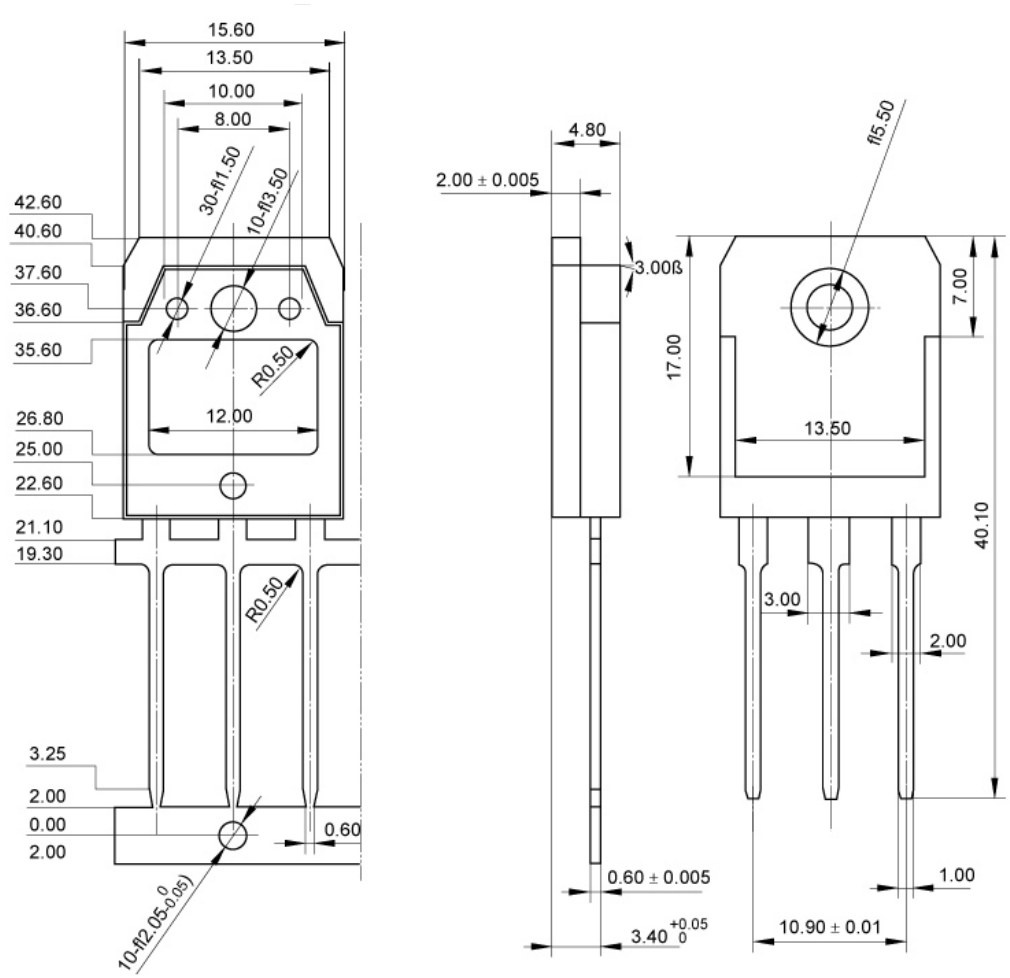

Fig.2 Outline dimensions (unindicated tolerance: 0.10mm)

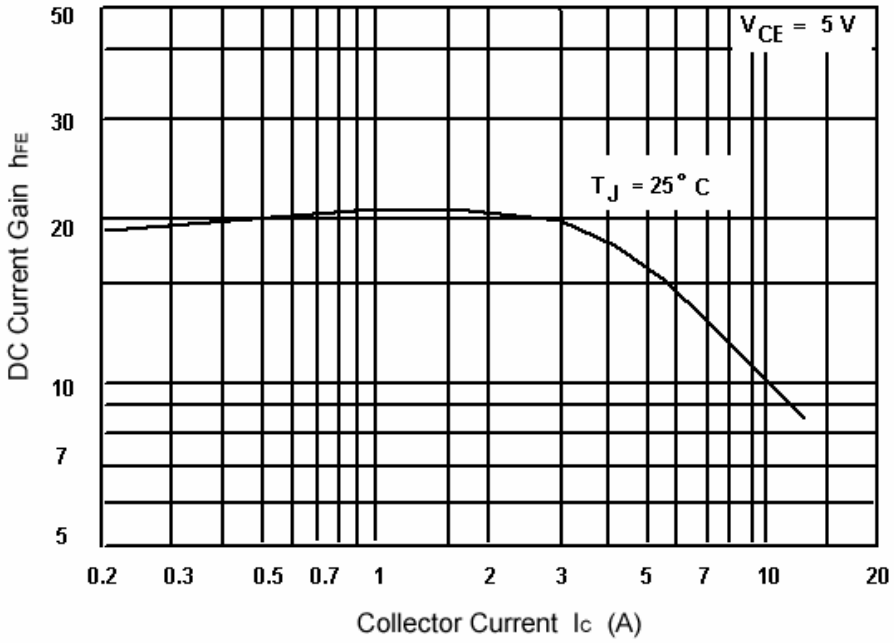

Fig.3 DC Current Gain

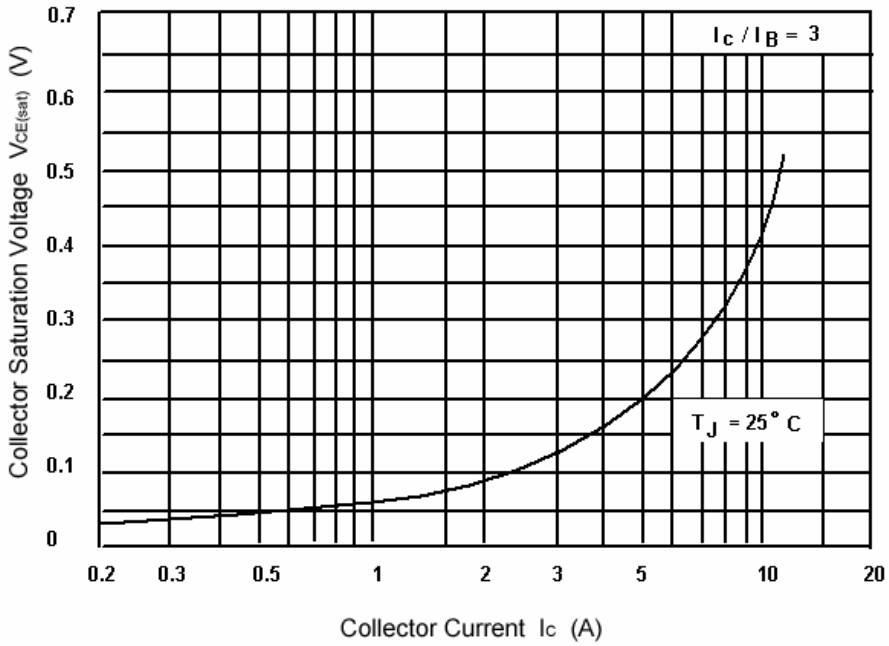

Fig.4 Collector–Emitter Saturation Voltage

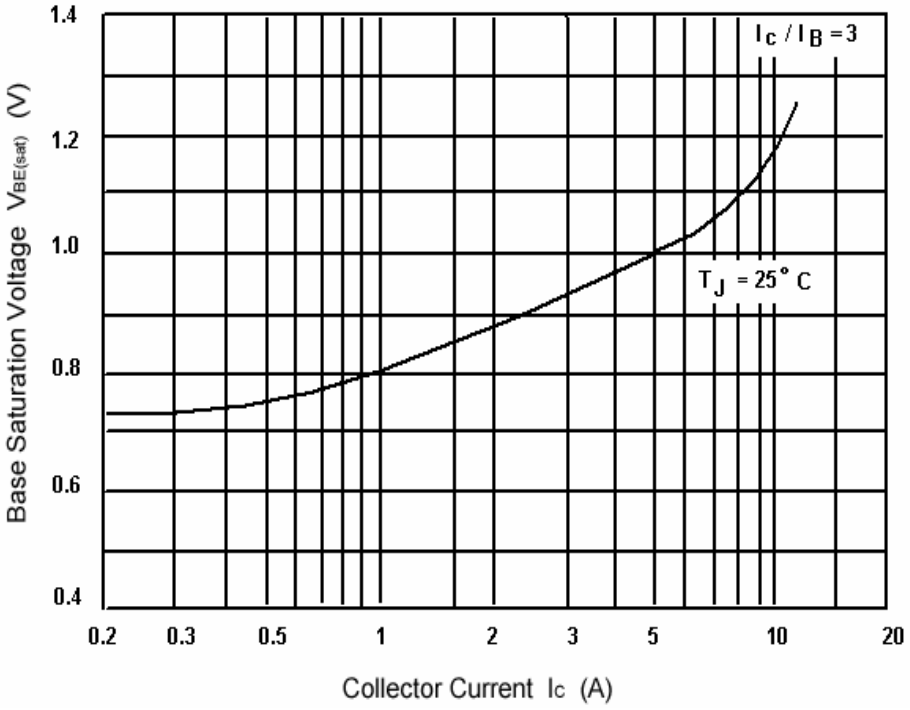

Fig.5 Base–Emitter Saturation Voltage

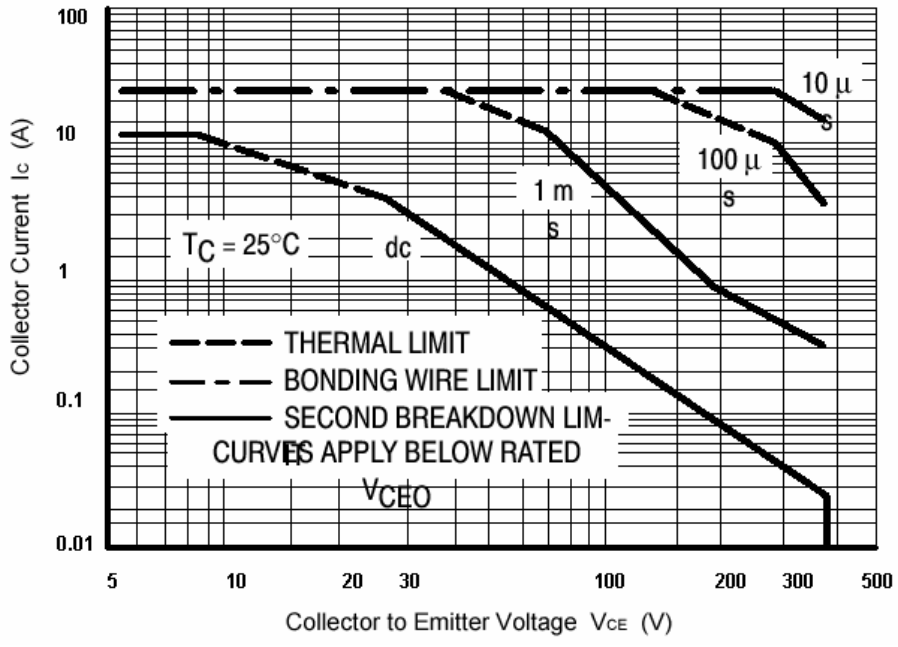

Fig.6 Safe Operating Area