

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

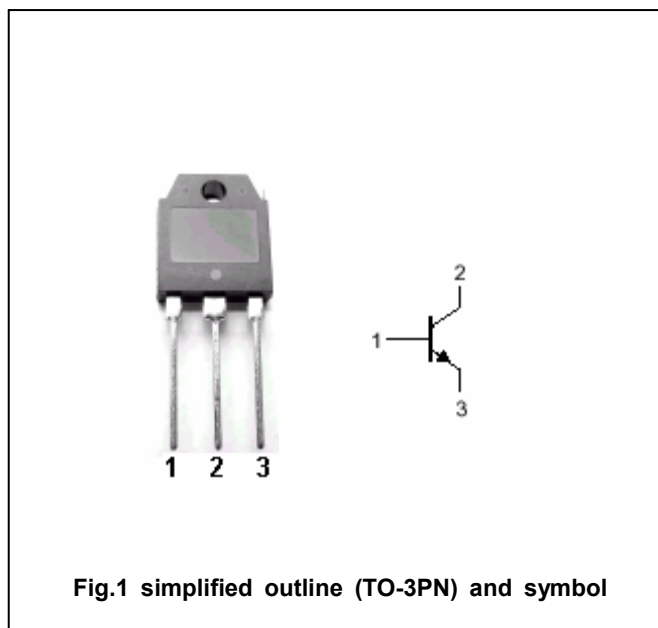


Fig.1 simplified outline (TO-3PN) and symbol

Absolute maximum ratings($T_c=25^\circ\text{C}$)

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
$R_{th\ j-C}$	Thermal resistance from junction to case	1.25	/W

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CHARACTERISTICS

T_j=25 unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V _{CEQ(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

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Technical drawing of a mechanical part, showing front, side, and top views with dimensions.

Front View (Left):

- Overall width: 15.60
- Top width: 13.50
- Inner width: 10.00
- Inner width (smaller): 8.00
- Top hole diameter: 30-f11.50
- Inner hole diameter: 10-f13.50
- Top hole position: 42.60
- Inner hole position: 40.60
- Top hole position: 37.60
- Inner hole position: 36.60
- Top hole position: 35.60
- Inner hole position: 26.80
- Inner hole position: 25.00
- Inner hole position: 22.60
- Inner hole position: 21.10
- Inner hole position: 19.30
- Inner hole position: 3.25
- Inner hole position: 2.00
- Inner hole position: 0.00
- Inner hole position: 2.00
- Inner hole position: 0.60
- Inner hole position: 10-f12.05-0.05
- Inner hole position: R0.50
- Inner hole position: R0.50

Side View (Right):

- Overall height: 40.10
- Top width: 4.80
- Top hole diameter: 2.00 ± 0.005
- Top hole position: 3.00
- Top hole position: 17.00
- Top hole position: 13.50
- Top hole position: 7.00
- Top hole position: 3.00
- Top hole position: 2.00
- Top hole position: 1.00
- Top hole position: 0.60 ± 0.005
- Top hole position: 3.40^{+0.05}₀
- Top hole position: 10.90 ± 0.01
- Top hole position: R0.50

Top View (Bottom):

- Overall width: 15.60
- Top width: 13.50
- Inner width: 10.00
- Inner width (smaller): 8.00
- Top hole diameter: 30-f11.50
- Inner hole diameter: 10-f13.50
- Top hole position: 42.60
- Inner hole position: 40.60
- Top hole position: 37.60
- Inner hole position: 36.60
- Top hole position: 35.60
- Inner hole position: 26.80
- Inner hole position: 25.00
- Inner hole position: 22.60
- Inner hole position: 21.10
- Inner hole position: 19.30
- Inner hole position: 3.25
- Inner hole position: 2.00
- Inner hole position: 0.00
- Inner hole position: 2.00
- Inner hole position: 0.60
- Inner hole position: 10-f12.05-0.05
- Inner hole position: R0.50
- Inner hole position: R0.50

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

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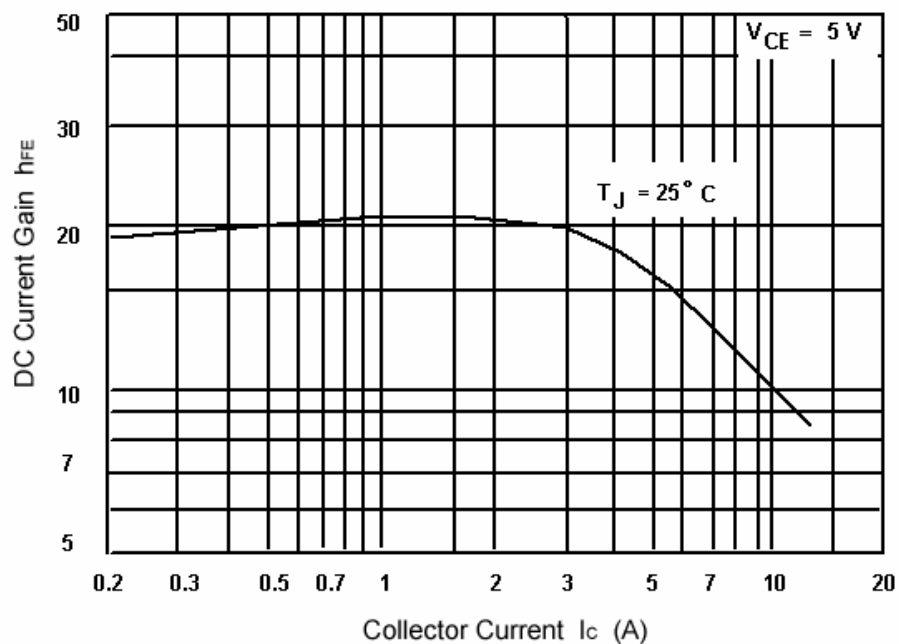


Fig.3 DC Current Gain

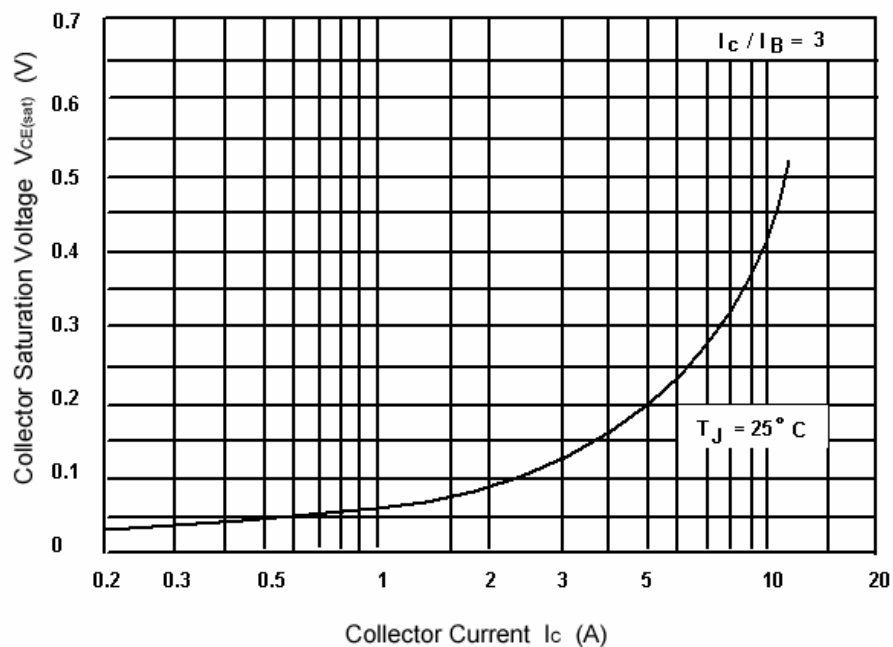


Fig.4 Collector-Emitter Saturation Voltage

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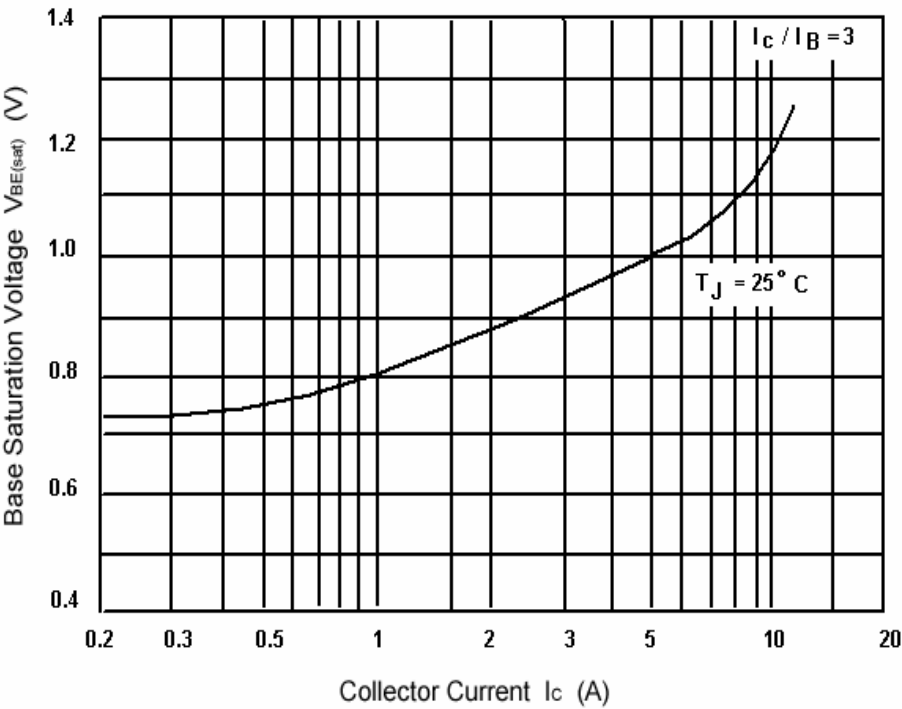


Fig.5 Base-Emitter Saturation Voltage

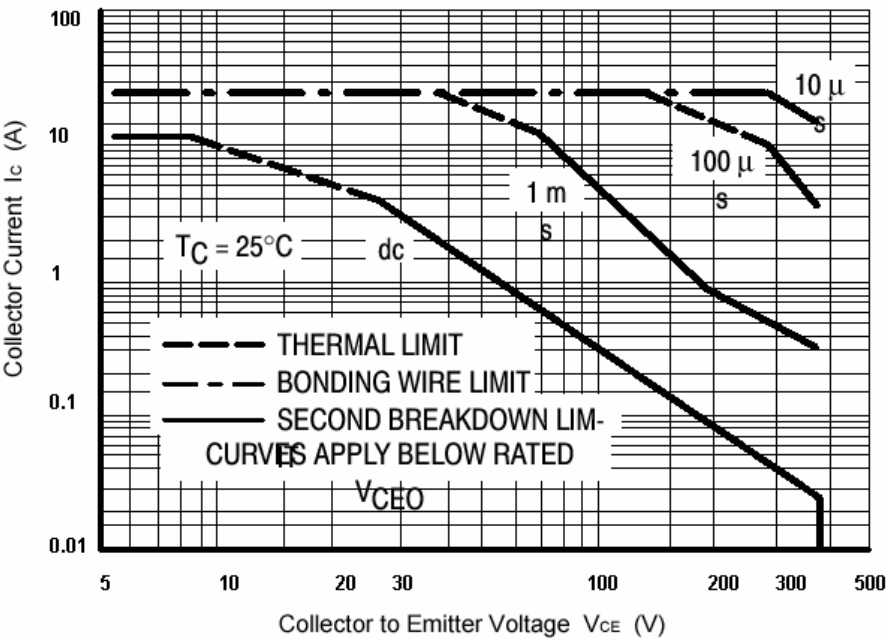


Fig.6 Safe Operating Area