

Silicon NPN Power Transistors

MJE13003

DESCRIPTION

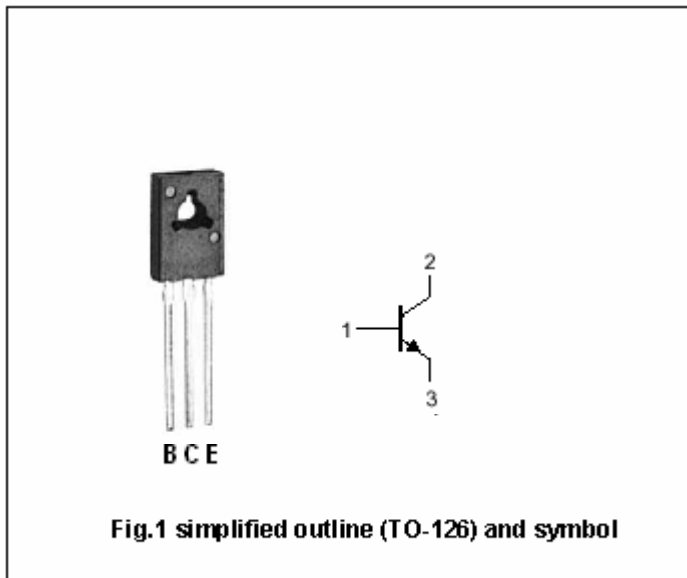
- With TO-126 package
- High voltage ,high speed

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



Absolute maximum ratings (Tc=25 )

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	Open emitter	700	V
V <sub>CEO</sub>	Collector-emitter voltage	Open base	400	V
V <sub>EBO</sub>	Emitter-base voltage	Open collector	9	V
I <sub>C</sub>	Collector current (DC)		1.5	A
I <sub>CM</sub>	Collector current-Peak		3	A
I <sub>B</sub>	Base current		0.75	A
I <sub>BM</sub>	Base current-Peak		1.5	A
I <sub>E</sub>	Emitter current		2.25	A
I <sub>EM</sub>	Emitter current-Peak		4.5	A
P <sub>D</sub>	Total power dissipation	T <sub>a</sub> =25	1.4	W
		T <sub>C</sub> =25	40	
T <sub>j</sub>	Junction temperature		150	
T <sub>stg</sub>	Storage temperature		-65~150	

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
R <sub>th j-c</sub>	Thermal resistance from junction to case	3.12	/W

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## CHARACTERISTICS

T<sub>j</sub>=25 unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>CEQ(SUS)</sub>	Collector-emitter sustaining voltage	I <sub>C</sub> =10mA ; I <sub>B</sub> =0	400			V
V <sub>CEsat-1</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =0.5A; I <sub>B</sub> =0.1A			0.5	V
V <sub>CEsat-2</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =1A; I <sub>B</sub> =0.25A T <sub>C</sub> =100			1.0 1.0	V
V <sub>CEsat-3</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =1.5A; I <sub>B</sub> =0.5A			3.0	V
V <sub>BEsat-1</sub>	Base-emitter saturation voltage	I <sub>C</sub> =0.5A; I <sub>B</sub> =0.1A			1.0	V
V <sub>BEsat-2</sub>	Base-emitter saturation voltage	I <sub>C</sub> =1A; I <sub>B</sub> =0.25A T <sub>C</sub> =100			1.2 1.1	V
I <sub>CEV</sub>	Collector cut-off current	V <sub>CEV</sub> =Rated value; V <sub>BE (off)</sub> =1.5V T <sub>C</sub> =100			1.0 5.0	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =9V; I <sub>C</sub> =0			1.0	mA
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =0.5A ; V <sub>CE</sub> =2V	8		40	
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =1A ; V <sub>CE</sub> =2V	5		25	
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =0.1A ; V <sub>CE</sub> =10V; f=1MHz	4			MHz
C <sub>OB</sub>	Collector outoput capacitance	I <sub>E</sub> =0; f=0.1MHz ; V <sub>CB</sub> =10V		21		pF

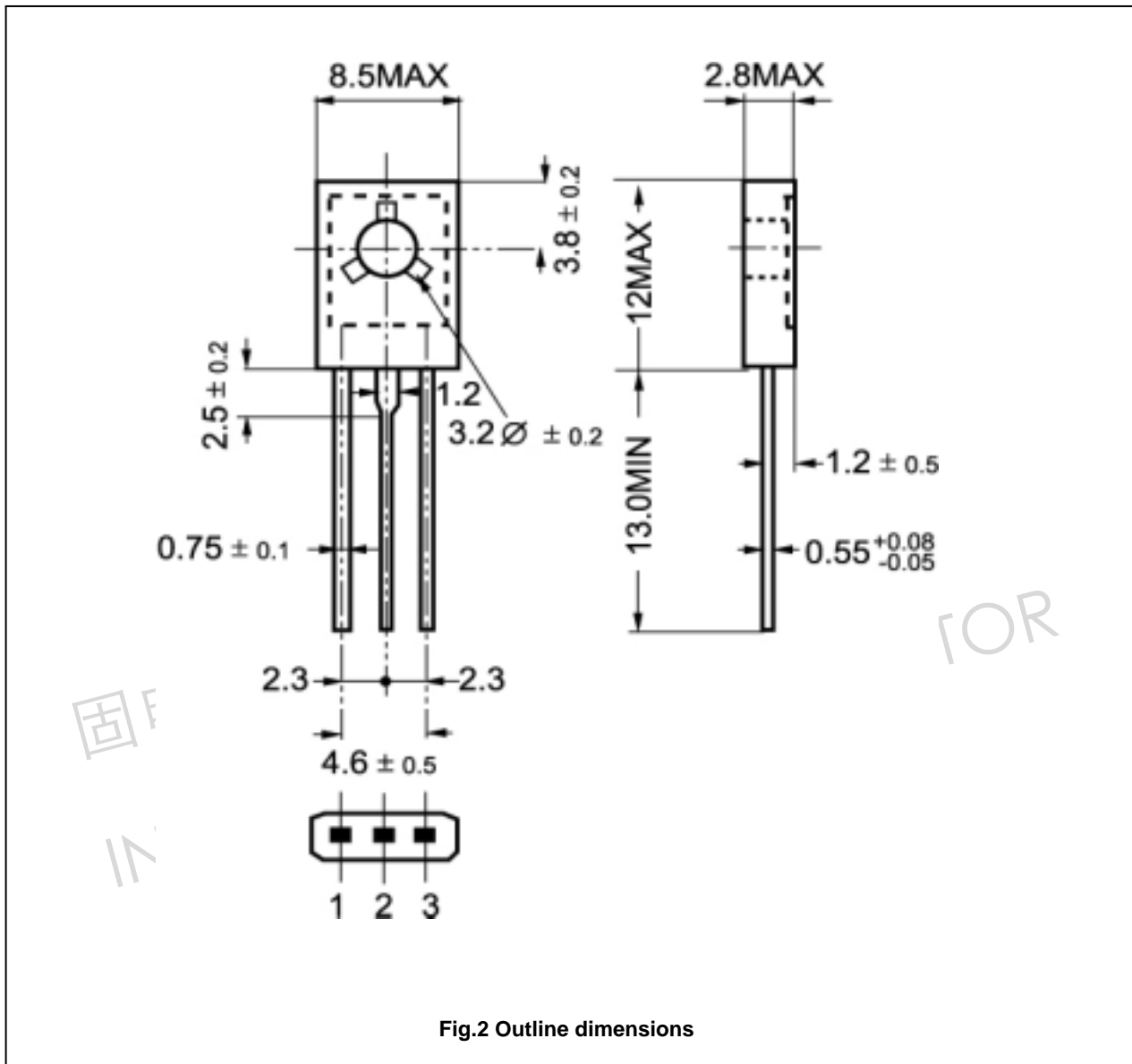
Switching times resistive load

t <sub>d</sub>	Delay time	V <sub>CC</sub> =125V , I <sub>C</sub> =1A I <sub>B1</sub> =-I <sub>B2</sub> =0.2A t <sub>p</sub> =25 μs duty cycle 1%		0.05	0.1	μs
t <sub>r</sub>	Rise time			0.5	1.0	μs
t <sub>s</sub>	Storage time			2.0	4.0	μs
t <sub>f</sub>	Fall time			0.4	0.7	μs

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PACKAGE OUTLINE



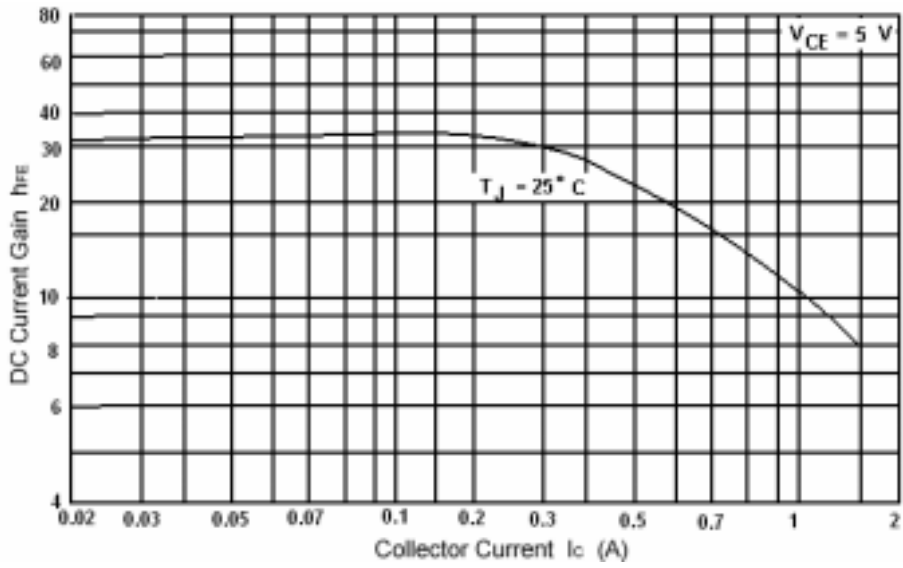


Fig.3 DC current Gain

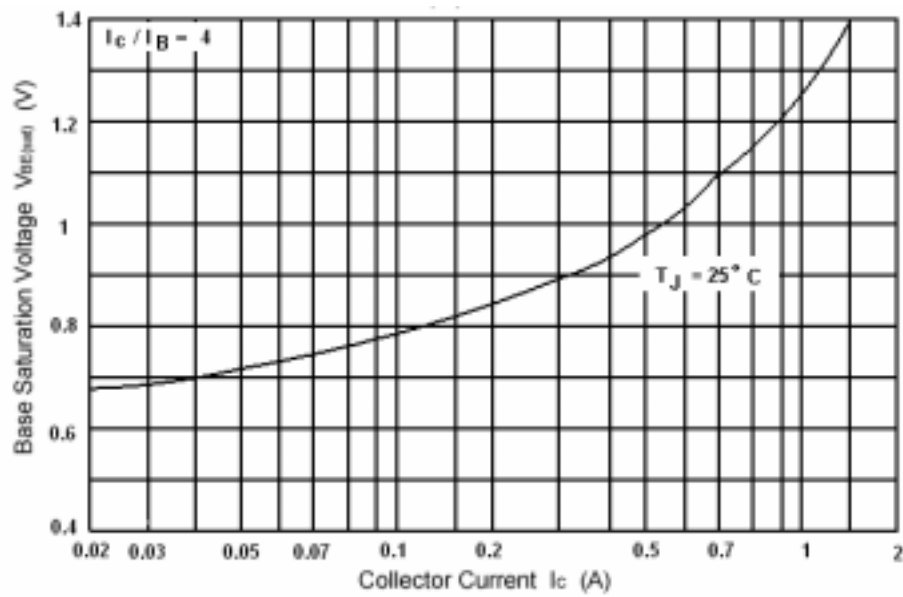


Fig.4 Base-Emitter Saturation Voltage

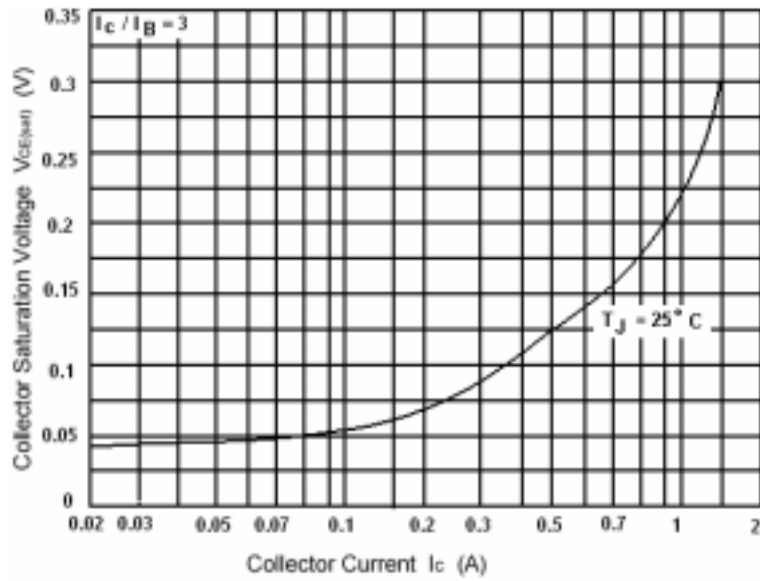


Fig.5 Collector-Emitter Saturation Voltage

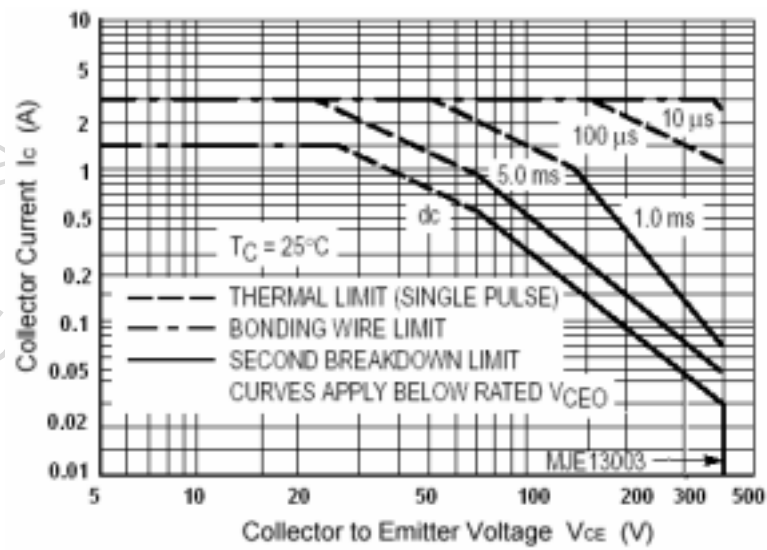


Fig.6 Safe Operating Area