

## Silicon NPN Power Transistors

## MJE18004

## DESCRIPTION

- With TO-220 package
- High voltage ,high speed

## APPLICATIONS

- Designed for use in 220V line-operated switchmode power supplies and electronic light ballasts

## PINNING

PIN	DESCRIPTION
1	Base
2	Collector
3	Emitter

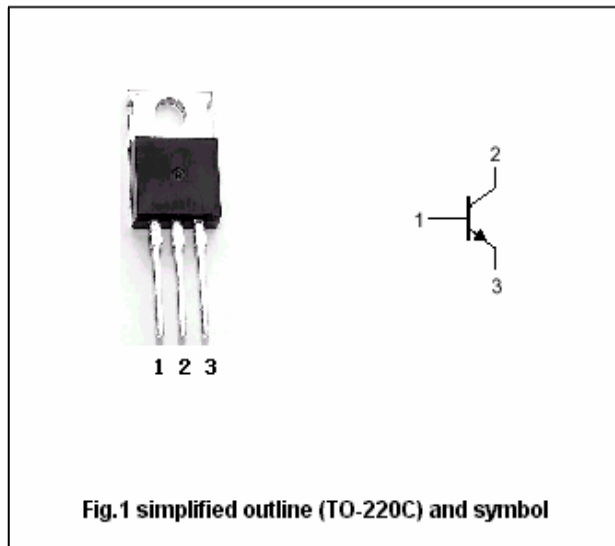


Fig.1 simplified outline (TO-220C) and symbol

ABSOLUTE MAXIMUM RATINGS( $T_c=25^\circ\text{C}$ )

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$V_{CBO}$	Collector-base voltage	Open emitter	1000	V
$V_{CEO}$	Collector-emitter voltage	Open base	450	V
$V_{EBO}$	Emitter-base voltage	Open collector	9	V
$I_C$	Collector current (DC)		5	A
$I_{CM}$	Collector current-Peak		10	A
$I_B$	Base current		2	A
$I_{BM}$	Base current-Peak		4	A
$P_D$	Total power dissipation	$T_c=25^\circ\text{C}$	100	W
$T_j$	Junction temperature		150	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-65~150	$^\circ\text{C}$

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
$R_{th\ j-C}$	Thermal resistance junction to case	1.25	$^\circ\text{C}/\text{W}$
$R_{th\ j-A}$	Thermal resistance junction to ambient	62.5	$^\circ\text{C}/\text{W}$

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## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>CEQ(SUS)</sub>	Collector-emitter sustaining voltage	I <sub>C</sub> =0.1A; L=25mH	450			V
V <sub>CE(sat)-1</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =1A; I <sub>B</sub> =0.1A T <sub>C</sub> =125°C			0.5 0.6	V
V <sub>CE(sat)-2</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =2A; I <sub>B</sub> =0.4A T <sub>C</sub> =125°C			0.45 0.8	V
V <sub>CE(sat)-3</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =2.5A; I <sub>B</sub> =0.5A			0.75	V
V <sub>BE(sat)-1</sub>	Base-emitter saturation voltage	I <sub>C</sub> =1A; I <sub>B</sub> =0.1A			1.1	V
V <sub>BE(sat)-2</sub>	Base-emitter saturation voltage	I <sub>C</sub> =2A; I <sub>B</sub> =0.4A			1.25	V
V <sub>BE(sat)-3</sub>	Base-emitter saturation voltage	I <sub>C</sub> =2.5A; I <sub>B</sub> =0.5A			1.3	V
I <sub>CES</sub>	Collector cut-off current	V <sub>CE</sub> =RatedV <sub>CE</sub> ; V <sub>EB</sub> =0	T <sub>C</sub> =125°C		0.1	mA
					0.5	
		V <sub>CE</sub> =800V			0.1	
I <sub>CEO</sub>	Collector cut-off current	V <sub>CE</sub> =RatedV <sub>CE</sub> ; I <sub>B</sub> =0			0.1	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =9V; I <sub>C</sub> =0			0.1	mA
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =1A; V <sub>CE</sub> =2.5V	12			
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =1A; V <sub>CE</sub> =5V	14		36	
h <sub>FE-3</sub>	DC current gain	I <sub>C</sub> =2A; V <sub>CE</sub> =1V	6			
h <sub>FE-4</sub>	DC current gain	I <sub>C</sub> =5mA; V <sub>CE</sub> =5V	10			
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =0.5A; V <sub>CE</sub> =10V; f=1.0MHz		13		MHz
C <sub>OB</sub>	Collector output capacitance	I <sub>E</sub> =0; V <sub>CB</sub> =10V; f=1.0MHz		45		pF

Switching times resistive load, Duty Cycle≤10%, Pulse Width=20μs

t <sub>on</sub>	Turn-on time	V <sub>CC</sub> =250V, I <sub>C</sub> =2.5A I <sub>B1</sub> =0.5A; I <sub>B2</sub> =0.5A			0.6	μs
t <sub>s</sub>	Storage time				3.0	μs
t <sub>f</sub>	Fall time				0.4	μs

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PACKAGE OUTLINE

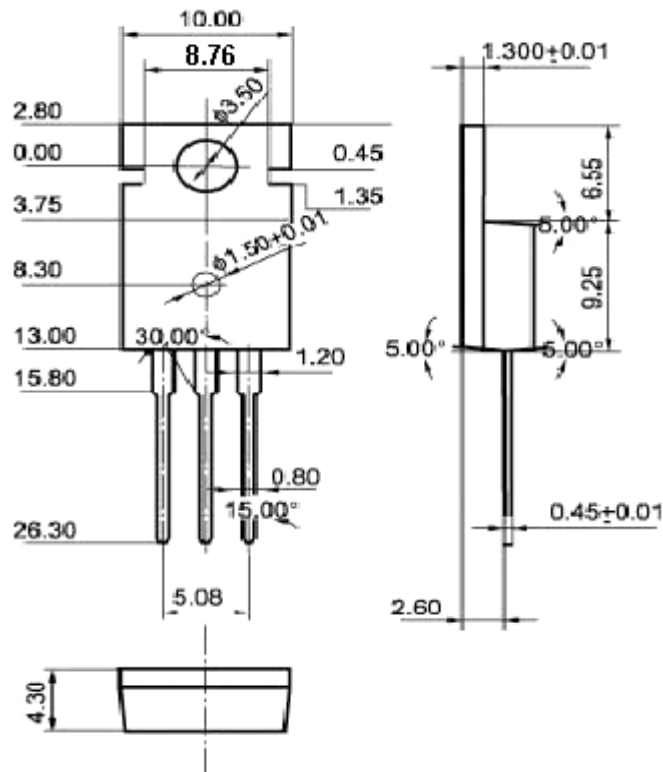


Fig.2 Outline dimensions (unindicated tolerance:  $\pm 0.10$ mm)