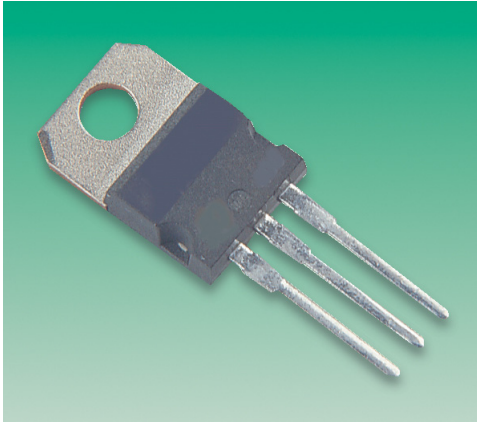


# MJE13007

## Power Transistor



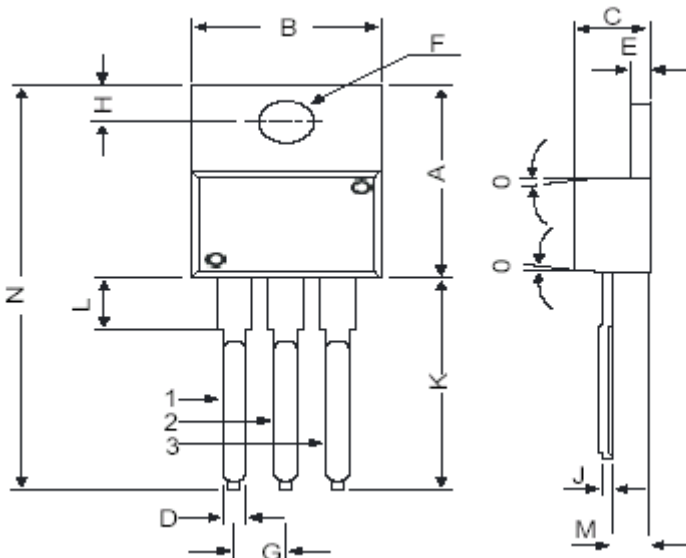
### High Voltage Switching



### Features:

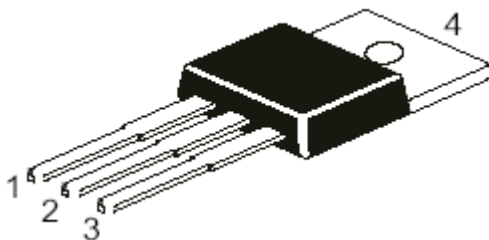
- NPN Plastic Power Transistors.
- Switchmode Series NPN Silicon Power Transistors.

### TO-220 Plastic Package



Dimension	Minimum	Maximum
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	-	0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J	-	0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N	-	31.24
O	7°	

Dimensions : Millimetres



### Pin Configuration:

1. Base
2. Collector
3. Emitter
4. Collector



### Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector Emitter Sustaining Voltage	$V_{CEO(sus)}$	400	V
Collector Emitter Voltage	$V_{CEV}$	700	
Emitter Base Voltage	$V_{EBO}$	9	
Collector Current Continuous *Peak	$I_C$ $I_{CM}$	8 16	A
Base Current Continuous *Peak	$I_B$ $I_{BM}$	4 8	
Emitter Current Continuous *Peak	$I_E$ $I_{EM}$	12 24	
Power Dissipation up to $T_a = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	2 16	W mW/ $^\circ\text{C}$
Power Dissipation up to $T_C = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$		80 640	
Operating and Storage Junction Temperature Range	$T_j, T_{stg}$	-65 to +150	$^\circ\text{C}$

\*Pulse Test: Pulse Width = 5ms, duty cycle  $\leq 10\%$

### Thermal Resistance

Junction to Case	$R_{th(j-c)}$	1.56	$^\circ\text{C/W}$
Junction to Ambient in Free Air	$R_{th(j-a)}$	62.5	
Maximum Lead Temperature for Soldering Purpose 1/8" from Case for 5 Seconds	$T_L$	275	$^\circ\text{C}$

### Electrical Characteristics ( $T_C = 25^\circ\text{C}$ unless specified otherwise)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Unit
Collector Emitter Sustaining Voltage	** $V_{CEO(sus)}$	$I_C = 10\text{mA}, I_B = 0$	400	-	-	V
Collector Cut off Current	$I_{CEV}$	$V_{CEV} = \text{Rated Value}, V_{BE(off)} = 1.5\text{V}$ $T_C = 100^\circ\text{C}$ $V_{CEV} = \text{Rated Value}, V_{BE(off)} = 1.5\text{V}$	-	-	1.0 5.0	mA
Emitter Cut off Current	$I_{EBO}$	$V_{EB} = 9\text{V}, I_C = 0$	-	-	1.0	
DC Current Gain	** $h_{FE}$	$I_C = 2\text{A}, V_{CE} = 5\text{V}$ $I_C = 5\text{A}, V_{CE} = 5\text{V}$	8 5	-	60 30	-

# MJE13007

## Power Transistor



Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Unit
Collector Emitter Saturation Voltage	**VCE(sat)	IC = 2A, IB = 0.4A IC = 5A, IB = 1A IC = 8A, IB = 2A IC = 5A, IB = 1A, TC = 100°C	-	-	1 2 3 3	V
Base Emitter Saturation Voltage	**VBE(sat)	IC = 2A, IB = 0.4A IC = 5A, IB = 1A IC = 5A, IB = 1A, TC = 100°C	-	-	1.2 1.6 1.5	V

### Electrical Characteristics (T<sub>C</sub> = 25°C unless specified otherwise)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Unit
Current Gain-Bandwidth Product	f <sub>T</sub>	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V, f = 1MHz	4	-	-	MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 0.1MHz	-	110	-	pF

### Switching Characteristics

Resistive Load	Symbol	Test Condition	Minimum	Typical	Maximum	Unit
Delay Time	t <sub>d</sub>	V <sub>CC</sub> = 125V, I <sub>C</sub> = 5A, I <sub>B1</sub> = I <sub>B2</sub> = 1A, t <sub>p</sub> = 25μs, Duty Cycle ≤1%	-	-	0.1	μs
Rise Time	t <sub>r</sub>		-	-	1.5	
Storage Time	t <sub>s</sub>		-	-	3.0	
Fall Time	t <sub>f</sub>		-	-	0.7	
Inductive Load, Clamped						
Voltage Storage Time	t <sub>sv</sub>	V <sub>clamp</sub> = 300V, I <sub>C</sub> = 5A, I <sub>B1</sub> = 1A, V <sub>BE(off)</sub> = 5V, T <sub>C</sub> = 100°C	-	-	2.3	μs
Crossover Time	t <sub>c</sub>		-	-	0.7	

\*\*Pulse Test: Pulse Width = 300μs, Duty Cycle ≤2%

### Specifications

I <sub>C(av)</sub> maximum (A)	V <sub>CEO</sub> maximum (V)	V <sub>CEV</sub> maximum (V)	V <sub>CE(sat)</sub> (V) at I <sub>C</sub> = 5A	t <sub>f</sub> maximum (μs)	P <sub>D</sub> at 25°C (W)	Type	Package	Part Number
8	400	700	2	0.7	80	NPN	TO-220	MJE13007



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