



MJE13007

SILICON POWER TRANSISTORS

NPN power transistors in a TO-220 package. They are intended for high voltage, high speed power switching inductive circuits where fall time is critical. They are particularly suited for 115V and 220V SWITCHMODE applications such as switching regulator's, inverters, motor controls, solenoid/relay drivers and deflection circuits.

Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings	Value	Unit
V_{CEO}	Collector-Emitter Voltage	400	V
V_{CBO}	Collector-Base Voltage	700	V
V_{EBO}	Emitter-Base Voltage	9	V
I_C	Collector Current	8	A
I_{CM}	Collector Peak Current (*)	16	A
I_B	Base Current	4	A
I_{BM}	Base Peak Current (*)	8	A
I_E	Emitter Current	12	A
I_{EM}	Emitter Peak Current (*)	24	A
P_T	Power Dissipation at Case Temperature @ $T_{mb} < 25^\circ$	80	W
t_J	Junction Temperature	150	°C
t_s	Storage Temperature range	-65 to +150	

(*)Pulse Width = 5ms, duty cycle <10%.

THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
R_{thJC}	From Junction to Case Thermal Resistance	1.56	°C/W
R_{thJA}	From Junction to Free-Air Thermal Resistance	62.5	

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ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
V_{CEO}	Collector-Emitter Sustaining Voltage (*)	$I_C = 10 \text{ mA}$, $I_B = 0$	400	-	-	V
I_{CBO}	Collector- Cutoff Current	$V_{CB} = 700 \text{ V}$ $I_B = 0$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	0.1 1	mA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 9 \text{ V}$, $I_C = 0$	-	-	0.1	mA
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C = 2 \text{ A}$, $I_B = 400 \text{ mA}$ $I_C = 5 \text{ A}$, $I_B = 1 \text{ A}$ $I_C = 8 \text{ A}$, $I_B = 2 \text{ A}$	- - -	- - -	1 2 3 13	V
$V_{BE(SAT)}$	Base-Emitter Saturation Voltage (*)	$I_C = 2 \text{ A}$, $I_B = 400 \text{ mA}$ $I_C = 5 \text{ A}$, $I_B = 1 \text{ A}$	- - -	- - -	1.2 1.6 1.5	V
h_{FE}	Forward Current transfer ratio (*)	$V_{CE} = 5.0 \text{ V}$, $I_C = 2 \text{ A}$ $V_{CE} = 5.0 \text{ V}$, $I_C = 5 \text{ A}$	8 5	- -	40 30	-
f_T	Transition Frequency	$V_{CE} = 10 \text{ V}$, $I_C = 0.5 \text{ A}$, $f = 1 \text{ MHz}$	4	-	-	MHz
C_{OB}	Output Capacitance	$I_E = 0$; $V_{CB} = 10 \text{ V}$; $f = 1 \text{ MHz}$	-	80	-	pF

(*) Pulse Width $\approx 300 \mu\text{s}$, Duty Cycle $\angle 2.0\%$

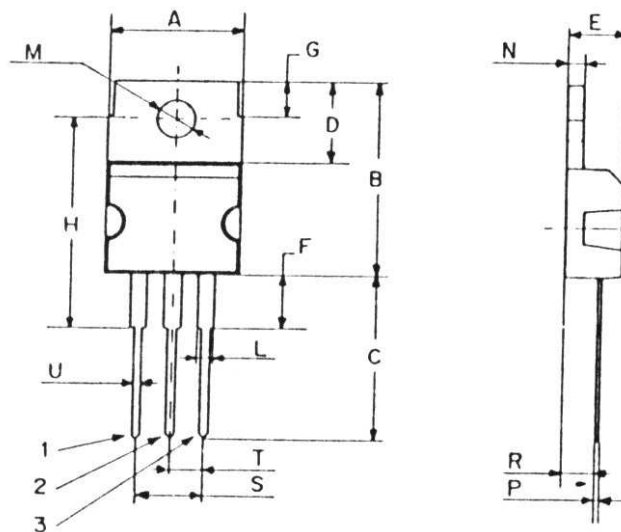
SWITCHING TIMES.

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit
t_d	Delay Time	$V_{CC} = 125 \text{ V}$; $I_C = 5 \text{ A}$ $I_{B1} = -I_{B2} = 1 \text{ mA}$ $t_p = 25 \mu\text{s}$, duty cycle $< 1\%$.	-	-	0.1	μs
t_r	Rise time		-	-	1.5	
t_s	Storage Time		-	-	3	
t_f	Fall Time		-	-	0.7	

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MECHANICAL DATA CASE TO-220

DIMENSIONS (mm)		
	Min.	Max.
A	9,90	10,30
B	15,65	15,90
C	13,20	13,40
D	6,45	6,65
E	4,30	4,50
F	2,70	3,15
G	2,60	3,00
H	15,75	17,15
L	1,15	1,40
M	3,50	3,70
N	-	1,37
P	0,46	0,55
R	2,50	2,70
S	4,98	5,08
T	2,49	2,54
U	0,70	0,90



Pin 1 :	Base
Pin 2 :	Collector
Pin 3 :	Emitter
Case :	Collector

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