



MJE13007

## SILICON NPN SWITCHING TRANSISTOR

- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY

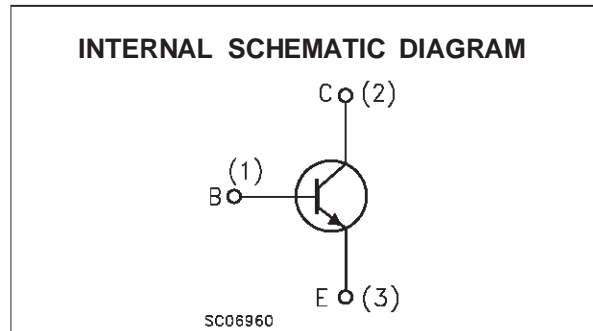
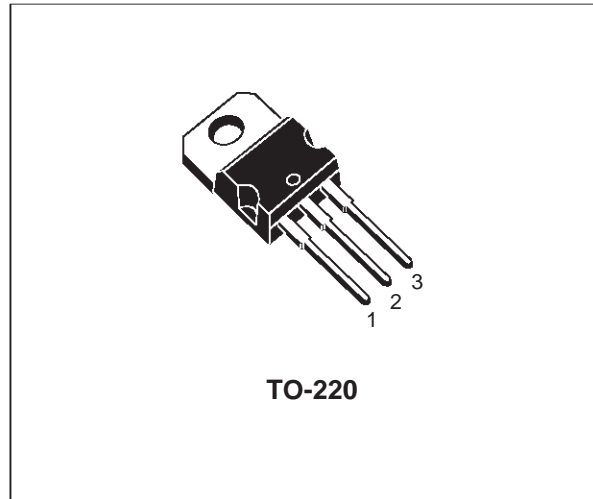
### APPLICATIONS

- SWITCHING REGULATORS
- MOTOR CONTROL

### DESCRIPTION

The MJE13007 is a silicon multiepitaxial mesa NPN power transistor mounted in Jedec TO-220 plastic package.

It is intended for use in motor control, switching regulators etc.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CEV}$	Collector-Emitter Voltage ( $V_{BE} = -1.5V$ )	700	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	400	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	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
$P_{tot}$	Total Dissipation at $T_c \leq 25^\circ C$	80	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ C$
$T_j$	Max. Operating Junction Temperature	150	$^\circ C$

**THERMAL DATA**

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	1.56	°C/W
-----------------------	----------------------------------	-----	------	------

**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEV</sub>	Collector Cut-off Current (V <sub>BE</sub> = -1.5V)	V <sub>CE</sub> = rated V <sub>CEV</sub> V <sub>CE</sub> = rated V <sub>CEV</sub> T <sub>c</sub> = 100 °C			1 5	mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 9 V			1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 10 mA	400			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 2 A I <sub>B</sub> = 0.4 A I <sub>C</sub> = 5 A I <sub>B</sub> = 1 A I <sub>C</sub> = 8 A I <sub>B</sub> = 2 A I <sub>C</sub> = 5 A I <sub>B</sub> = 1 A T <sub>c</sub> = 100 °C			1 1.5 3 2	V V V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 2 A I <sub>B</sub> = 0.4 A I <sub>C</sub> = 5 A I <sub>B</sub> = 1 A I <sub>C</sub> = 5 A I <sub>B</sub> = 1 A T <sub>c</sub> = 100 °C			1.2 1.6 1.5	V V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 2 A V <sub>CE</sub> = 5 V I <sub>C</sub> = 5 A V <sub>CE</sub> = 5 V	8 6		40 30	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = 0.5 A V <sub>CE</sub> = 10 V f = 1 MHz	4			MHz
C <sub>CBO</sub>	Output Capacitance	I <sub>E</sub> = 0 V <sub>CB</sub> = 10 V f = 0.1 MHz		110		pF

**RESISTIVE LOAD**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t <sub>on</sub>	Turn-on Time	V <sub>CC</sub> = 125 V I <sub>C</sub> = 5 A			0.7	μs
t <sub>s</sub>	Storage Time	I <sub>B1</sub> = -I <sub>B2</sub> = 1 A			3	ms
t <sub>f</sub>	Fall Time	t <sub>p</sub> = 25 μs Duty Cycle < 1%			0.7	ms

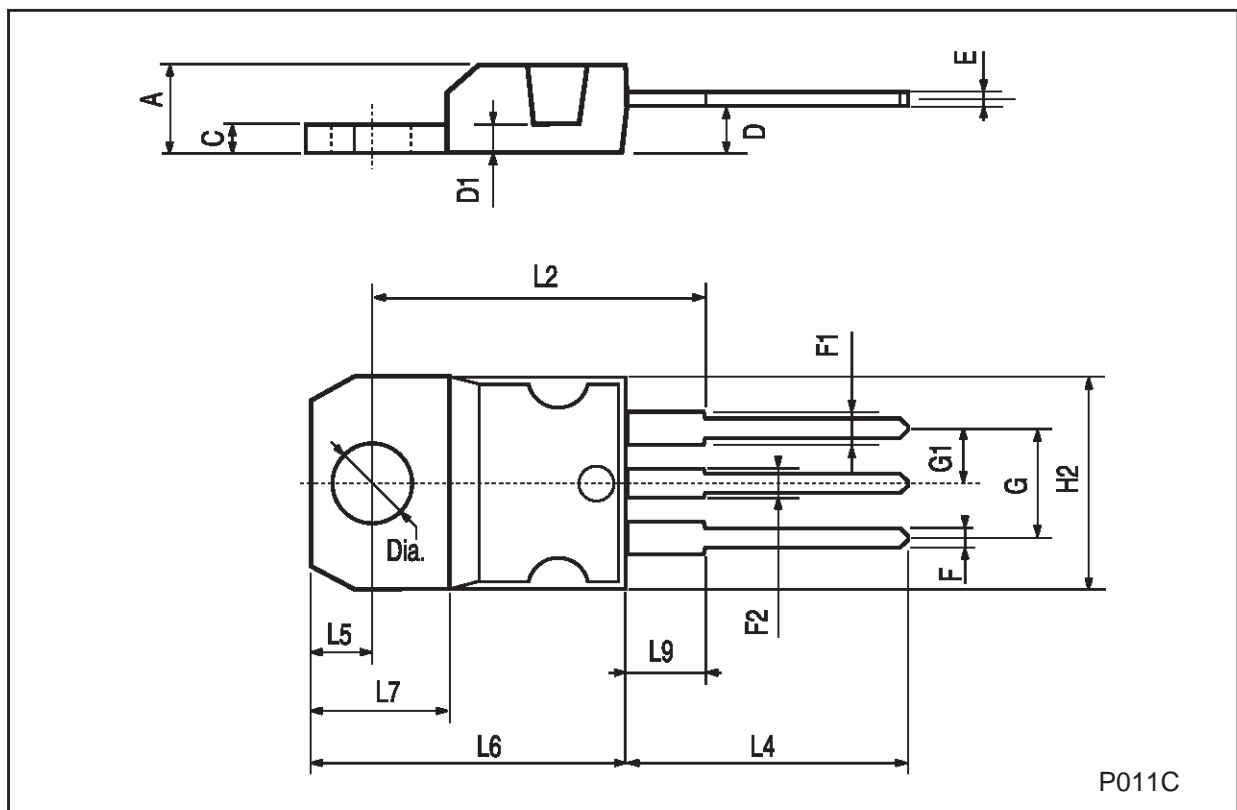
**INDUCTIVE LOAD**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t <sub>f</sub>	Fall Time	V <sub>CC</sub> = 125 V I <sub>C</sub> = 5 A I <sub>B1</sub> = 1 A t <sub>p</sub> = 25 μs Duty Cycle < 1%			0.3	μs
t <sub>f</sub>	Fall Time	V <sub>CC</sub> = 125 V I <sub>C</sub> = 5 A I <sub>B1</sub> = 1 A t <sub>p</sub> = 25 μs Duty Cycle < 1% T <sub>c</sub> = 100 °C			0.6	μs

\* Pulsed: Pulse duration = 300 μs, duty cycle 2 %

**TO-220 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



P011C

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 1998 STMicroelectronics – Printed in Italy – All Rights Reserved  
STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands -  
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.