SGS-THOMSON MICROELECTRONICS

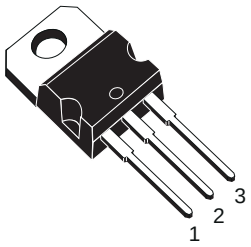
MJE13007A

SILICON NPN SWITCHING TRANSISTOR

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

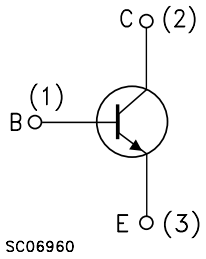
APPLICATIONS
- SWITCHING REGULATORS
- MOTOR CONTROL

DESCRIPTION
The MJE13007A is silicon multiepitaxial mesa NPN power transistor mounted in Jedec TO-220 plastic package.
They are inteded for use in motor control, switching regulators etc.



TO-220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-Emitter Voltage (V_{BE} = -1.5V)	850	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 $T_c \leq 25\ ^oC$	80	W
T_{stg}	Storage Temperature	-65 to 150	^oC
T_j	Max. Operating Junction Temperature	150	^oC

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.56	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cut-off Current (V_{BE} = -1.5V)	V_{CE} = rated V_{CEV} V_{CE} = rated V_{CEV} T_c = 100 ^oC			1 5	mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 9 V			1	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage	I_C = 10 mA	400			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 5 A I_B = 1 A I_C = 8 A I_B = 2 A I_C = 5 A I_B = 1 A T_c = 100 ^oC			1 1.5 3 2	V V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 5 A I_B = 1 A I_C = 5 A I_B = 1 A T_c = 100 ^oC			1.2 1.6 1.5	V V V
h_{FE}*	DC Current Gain	I_C = 2 A V_{CE} = 5 V I_C = 5 A V_{CE} = 5 V	8 6		40 30	
f_T	Transition Frequency	I_C = 0.5 A V_{CE} = 10 V f = 1 MHz	4			MHz
C_{CBO}	Output Capacitance	I_E = 0 V_{CB} = 10 V f = 0.1 MHz		110		pF

RESISTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{on}	Turn-on Time	V_{CC} = 125 V I_C = 5 A I_{B1} = -I_{B2} = 1 A t_p = 25 µs Duty Cycle < 1%			0.7	µs
t_s	Storage Time				3	µs
t_f	Fall Time				0.7	µs

INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_f	Fall Time	V_{CC} = 125 V I_C = 5 A I_{B1} = 1 A t_p = 25 µs Duty Cycle < 1%			0.3	µs
t_f	Fall Time	V_{CC} = 125 V I_C = 5 A I_{B1} = 1 A t_p = 25 µs Duty Cycle < 1% T_c = 100 ^oC			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