MJE13007A

SILICON NPN SWITCHING TRANSISTOR

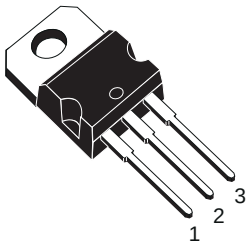
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY

APPLICATIONS
- SWITCHING REGULATORS
- MOTOR CONTROL

DESCRIPTION

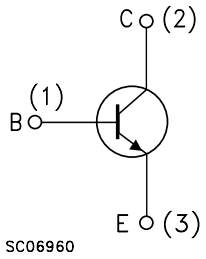
The MJE13007A is silicon multiepitaxial mesa NPN power transistor mounted in Jedec TO-220 plastic package.

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 %