

isc Silicon NPN Power Transistor

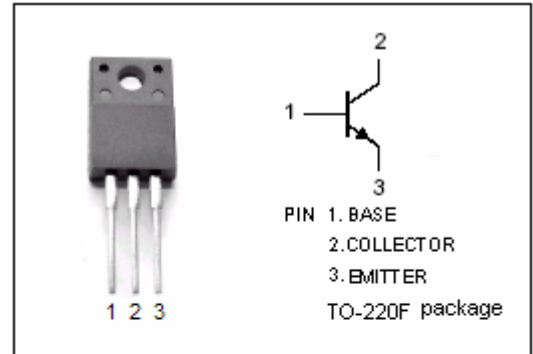
MJE13009F

DESCRIPTION

- Collector–Emitter Sustaining Voltage
: $V_{CEO(SUS)} = 400V(\text{Min.})$
- Collector Saturation Voltage
: $V_{CE(sat)} = 1.5 (\text{Max}) @ I_C = 8.0A$
- Switching Time
: $t_f = 0.7 \mu s(\text{Max.}) @ I_C = 8.0A$

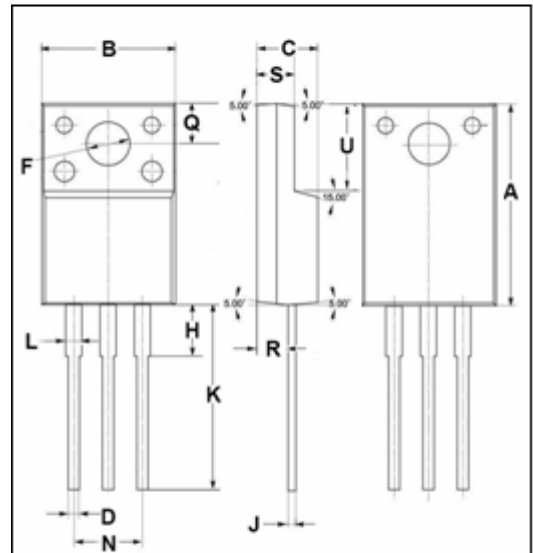
APPLICATIONS

- Designed for use in high-voltage, high-speed, power switching in inductive circuit, they are particularly suited for 115 and 220V switchmode applications such as switching regulators, inverters, Motor controls, Solenoid/Relay drivers and deflection circuits.



ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ C$)

SYMBOL	PARAMETER	VALUE	UNIT
V_{CEV}	Collector-Emitter Voltage	700	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	9	V
I_C	Collector Current-Continuous	12	A
I_{CM}	Collector Current-peak	24	A
I_B	Base Current	6	A
I_{BM}	Base Current-Peak	12	A
P_C	Collector Power Dissipation $T_C=25^\circ C$	50	W
T_j	Junction Temperature	150	$^\circ C$
T_{stg}	Storage Temperature Range	-65~150	$^\circ C$



DIM	mm	
	MIN	MAX
A	14.95	15.05
B	10.00	10.10
C	4.40	4.60
D	0.75	0.80
F	3.10	3.30
H	3.70	3.90
J	0.50	0.70
K	13.4	13.6
L	1.10	1.30
N	5.00	5.20
Q	2.70	2.90
R	2.20	2.40
S	2.65	2.85
U	6.40	6.60

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
$R_{th j-c}$	Thermal Resistance, Junction to Case	2.5	$^\circ C/W$
$R_{th j-a}$	Thermal Resistance, Junction to Ambient	62.5	$^\circ C/W$

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ELECTRICAL CHARACTERISTICS

 $T_C = 25^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CE0(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C = 10\text{mA}; I_B = 0$	400			V
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage	$I_C = 5\text{A}; I_B = 1\text{A}$			1.0	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage	$I_C = 8\text{A}; I_B = 1.6\text{A}$			1.5	V
$V_{CE(sat)-3}$	Collector-Emitter Saturation Voltage	$I_C = 12\text{A}; I_B = 3\text{A}$			3.0	V
$V_{BE(sat)-1}$	Base-Emitter Saturation Voltage	$I_C = 5\text{A}; I_B = 1\text{A}$			1.2	V
$V_{BE(sat)-2}$	Base-Emitter Saturation Voltage	$I_C = 8\text{A}; I_B = 1.6\text{A}$			1.6	V
I_{CEV}	Collector Cutoff Current	$V_{CEV} = 700\text{V}; V_{BE(off)} = 1.5\text{V}$ $T_C = 100^\circ\text{C}$			1 5	mA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 9\text{V}; I_C = 0$			1	mA
h_{FE-1}	DC Current Gain	$I_C = 5\text{A}; V_{CE} = 5\text{V}$	8		40	
h_{FE-2}	DC Current Gain	$I_C = 8\text{A}; V_{CE} = 5\text{V}$	6		30	
f_T	Current-Gain—Bandwidth Product	$I_C = 0.5\text{A}; V_{CE} = 10\text{V};$	4			MHz
C_{OB}	Output Capacitance	$I_E = 0; V_{CB} = 10\text{V}; f_{test} = 0.1\text{MHz}$		180		pF

Switching Times; Resistive Load

t_{on}	Storage Time	$I_C = 8\text{A}; V_{CC} = 125\text{V};$ $I_{B1} = I_{B2} = 1.6\text{A}; t_p = 25\ \mu\text{s};$ Duty Cycle $\leq 1\%$			1.1	μs
t_s	Storage Time				3.0	μs
t_f	Fall Time				0.7	μs