

MJ13333

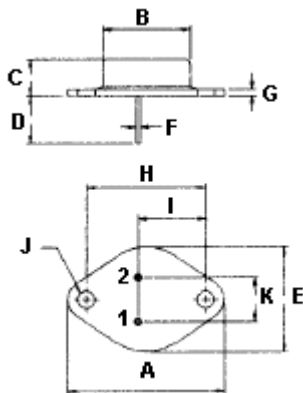
20A Power Transistors, 400V



NPN silicon transistors are designed for high voltage, high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line-operated switchmode applications such as Switching Regulators, Inverters, Motor Controls, Solenoid Drivers and Deflection Circuits.

Features:

- $V_{CEO(sus)} = 350V$ to $500V$.
- $V_{CE(sat)} = 1.8V$ (Maximum) at $I_C = 10A$, $I_B = 2.0A$.



Pin 1. Base
2. Emitter
Collector(Case)

Dimensions	Minimum	Maximum
A	38.75	39.96
B	19.28	22.24
C	7.96	9.28
D	11.18	12.19
E	25.20	26.68
F	0.92	1.10
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

Dimensions : Millimetres

NPN
MJ13333

20 Ampere
Power Transistors
NPN Silicon
400 Volts
175 Watts



TO-3

Maximum Ratings

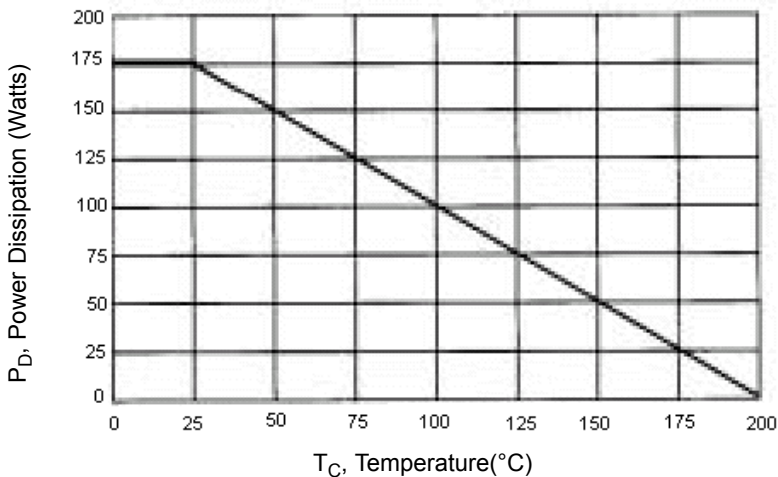
Characteristic	Symbol	MJ13333	Unit
Collector-Emitter Voltage	$V_{CEO(sus)}$	400	V
Collector-Emitter Voltage	V_{CEV}	700	
Emitter-Base Voltage	V_{EBO}	6.0	
Collector Current-Continuous -Peak	I_C	20 30	A
Base Current	I_B	10	
Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	175 1.0	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +200	$^\circ C$



Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.0	$^{\circ}\text{C/W}$

Figure - 1 Power Derating



Electrical Characteristics ($T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) ($I_C = 100\text{mA}$, $I_B = 0$)	$V_{CE(sus)}$	400	-	V
Collector Cut off Current ($V_{CE} = \text{Rated Value}$, $V_{BE(OFF)} = 1.5\text{V}$) ($V_{CE} = \text{Rated Value}$, $V_{BE(OFF)} = 1.5\text{V}$, $T_C = 125^{\circ}\text{C}$)	I_{CEV}	-	0.25 5.0	mA
Collector Cut off Current ($V_{CE} = \text{Rated Value}$, $V_{BE} = 50\Omega$, $T_C = 100^{\circ}\text{C}$)	I_{CER}	-	5.0	
Emitter Cut off Current ($V_{EB} = 6.0\text{V}$, $I_C = 0$)	I_{EBO}	-	1.0	
ON Characteristics				
DC Current Gain ($I_C = 5.0\text{A}$, $V_{CE} = 5.0\text{V}$)	h_{FE}	10	60	-
Collector-Emitter Saturation Voltage ($I_C = 10\text{A}$, $I_B = 2.0\text{A}$) ($I_C = 20\text{A}$, $I_B = 6.7\text{A}$)	$V_{CE(sat)}$	-	1.8 5.0	V
Base-Emitter Saturation Voltage ($I_C = 10\text{A}$, $I_B = 2.0\text{A}$)	$V_{BE(sat)}$	-	1.8	
Dynamic Characteristics				
Output Capacitance ($V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1.0\text{KHz}$)	C_{ob}	125	500	pF

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Switching Characteristics

Characteristic	Symbol	Minimum	Maximum	Unit
Switching Characteristics				
Delay Time	t_d	-	0.2	μs
Rise Time	t_r	-	0.8	
Storage Time	t_s	-	4.0	
Fall Time	t_f	-	0.8	

$V_{CC} = 250V, I_C = 10A$
 $I_{B1} = 2.0A, t_p = 10\mu s, \text{Duty Cycle} \leq 2\%$
 $V_{BE(OFF)} = 5.0V$

(1) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤2.0%

Specifications

$I_{C(av)}$ maximum (A)	V_{CEO} maximum (V)	h_{FE} minimum	I_C (A)	P_{tot} at 25°C (W)	Package	Type	Part Number
20	400	10	5	175	TO-3	NPN	MJ13333

MJ13333

20A Power Transistors, 400V

Notes:

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