

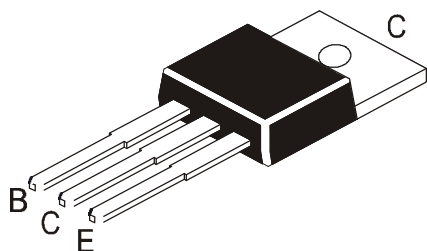
NPN PLASTIC POWER TRANSISTORS

MJE13004

MJE13005

TO-220

Plastic Package



Switchmode Series NPN Silicon Power Transistors

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	MJE13004	MJE13005	UNIT
Collector Emitter Sustaining Voltage	$V_{CEO(sus)}$	300	400	V
Collector Emitter Voltage	V_{CEV}	600	700	V
Emitter Base Voltage	V_{EBO}		9	V
Collector Current Continuous	I_C		4	A
*Peak	I_{CM}		8	A
Base Current Continuous	I_B		2	A
*Peak	I_{BM}		4	A
Emitter Current Continuous	I_E		6	A
*Peak	I_{EM}		12	A
Power Dissipation upto $T_a=25^\circ\text{C}$	P_D		2	W
Derate above $=25^\circ\text{C}$			16	mW/ $^\circ\text{C}$
Power Dissipation upto $T_c=25^\circ\text{C}$	P_D		75	W
Derate above $=25^\circ\text{C}$			600	mW/ $^\circ\text{C}$
Operating And Storage Junction Temperature Range	T_j, T_{stg}		- 65 to +150	$^\circ\text{C}$

* Pulse Test: Pulse Width =5ms, Duty Cycle $\leq 10\%$

THERMAL RESISTANCE

Junction to Case	$R_{th(j-c)}$	1.67	$^\circ\text{C/W}$
Junction to Ambient in free air	$R_{th(j-a)}$	62.5	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purpose 1/8" from Case for 5 Seconds	T_L	275	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ Unless Specified Otherwise)

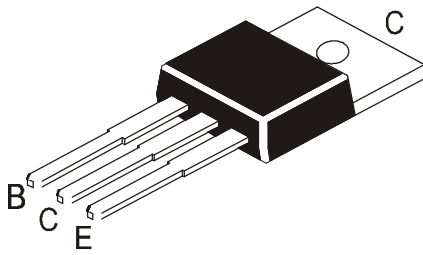
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter sustaining voltage	** $V_{CEO(sus)}$	$I_C=10\text{mA}, I_B=0$ MJE13004 MJE13005	300 400			V V
Collector Cut off Current	I_{CEV}	$V_{CEV}=\text{Rated Value}, V_{BE}(\text{off})=1.5\text{V}$ $T_c=100^\circ\text{C}$ $V_{CEV}=\text{Rated Value}, V_{BE}(\text{off})=1.5\text{V}$			1.0 5.0	mA mA
Emitter Cut off Current	I_{EBO}	$V_{EB}=9\text{V}, I_C=0$			1.0	mA
DC Current Gain	** h_{FE}	$I_C=1\text{A}, V_{CE}=5\text{V}$ $I_C=2\text{A}, V_{CE}=5\text{V}$	10 8		60 40	

**Pulse Test: Pulse Width=300ms, Duty Cycle $\leq 2\%$

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ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ Unless Specified Otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	$**V_{CE(sat)}$	$I_C=1A, I_B=0.2A$			0.5	V
		$I_C=2A, I_B=0.5A$			0.6	V
		$I_C=4A, I_B=1A$			1.0	V
		$I_C=2A, I_B=0.5A, T_c=100^\circ\text{C}$			1.0	V
Base Emitter Saturation Voltage	$**V_{BE(sat)}$	$I_C=1A, I_B=0.2A$			1.2	V
		$I_C=2A, I_B=0.5A$			1.6	V
		$I_C=2A, I_B=0.5A, T_c=100^\circ\text{C}$			1.5	V
Current Gain-Bandwidth Product	f_T	$I_C=500\text{mA}, V_{CE}=10\text{V}, f=1\text{MHz}$	4			MHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$		65		pF

SWITCHING CHARACTERISTICS

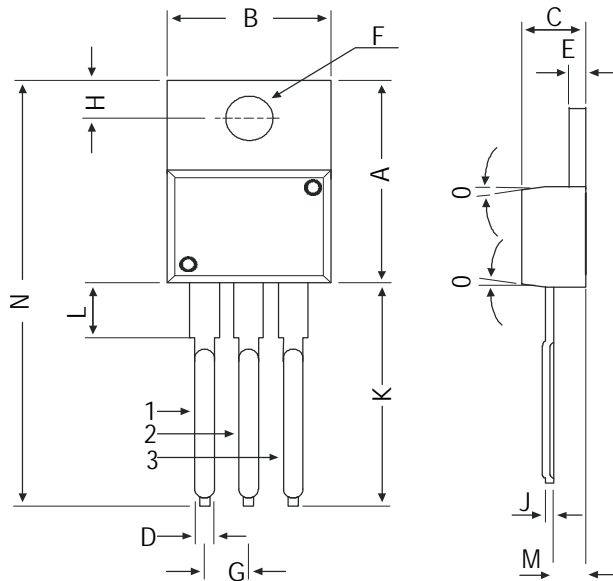
Resistive Load	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Delay Time	t_d	$V_{CC}=125\text{V}, I_C=2A, I_{B1}=I_{B2}=0.4A,$ $t_p=25\mu\text{s}, \text{Duty Cycle} \leq 1\%$			0.1	μs
Rise Time	t_r				0.7	μs
Storage Time	t_s				4.0	μs
Fall Time	t_f				0.9	μs

Inductive Load, Clamped

	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Voltage Storage Time	t_{sv}	$V_{Clamp}=300\text{V}, I_C=2A, I_{B1}=0.4A,$ $V_{BE(off)}=5\text{V}, T_c=100^\circ\text{C}$			4.0	μs
Crossover Time	t_C				0.9	μs
Fall Time	t_{fi}			0.16		μs

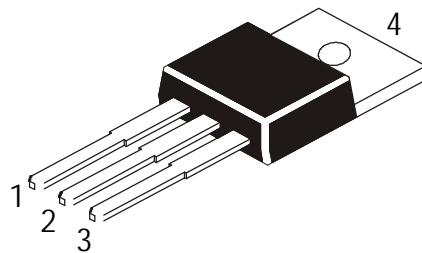
**Pulse Test: Pulse Width=300ms, Duty Cycle \leq 2%

TO-220 Plastic Package



DIM	MIN	MAX
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J	—	0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N	—	31.24
O	7 DEG	

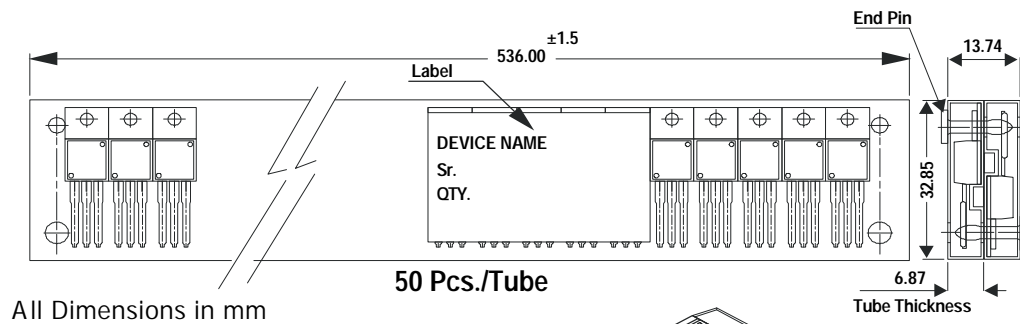
All diminsions in mm.



Pin Configuration

1. Base
2. Collector
3. Emitter
4. Collector

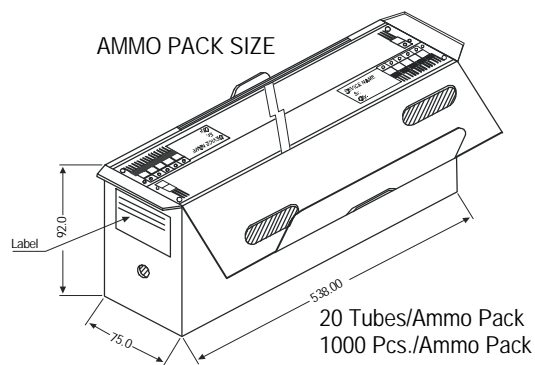
TO-220 Tube Packing



All Dimensions in mm

50 Pcs./Tube

AMMO PACK SIZE



20 Tubes/Ammo Pack
1000 Pcs./Ammo Pack

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-220 /FP	200 pcs/polybag	396 gm/200 pcs	3" x 7.5" x 7.5"	1.0K	17" x 15" x 13.5"	16.0K	36 kgs
	50 pcs/tube	120 gm/50 pcs	3.5" x 3.7" x 21.5"	1.0K	19" x 19" x 19"	10.0K	29 kgs

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