

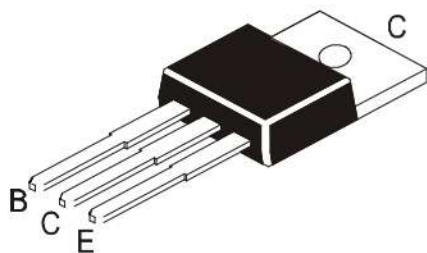
NPN PLASTIC POWER TRANSISTORS

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 $\leq 10\%$

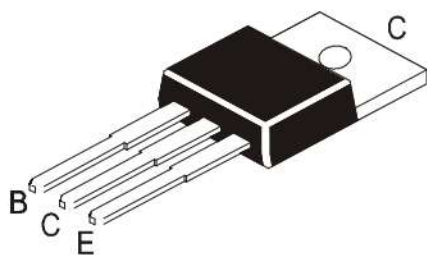
THERMAL RESISTANCE

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=300 μs , Duty Cycle $\leq 2\%$

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1\text{A}, I_B=0.2\text{A}$ $I_C=2\text{A}, I_B=0.5\text{A}$ $I_C=4\text{A}, I_B=1\text{A}$ $I_C=2\text{A}, I_B=0.5\text{A}, T_c=100^\circ\text{C}$			0.5 0.6 1.0 1.0	V V V V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=1\text{A}, I_B=0.2\text{A}$ $I_C=2\text{A}, I_B=0.5\text{A}$ $I_C=2\text{A}, I_B=0.5\text{A}, T_c=100^\circ\text{C}$			1.2 1.6 1.5	V V 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

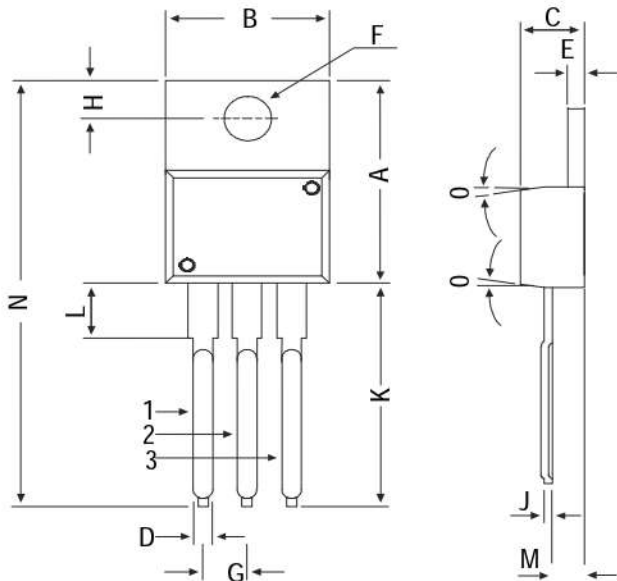
Resistive Load	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Delay Time	t_d	$V_{CC}=125\text{V}, I_C=2\text{A}, I_{B1}=I_{B2}=0.4\text{A},$ $t_p=25\mu\text{s}, \text{Duty Cycle}\leq 1\%$			0.1	μs
Rise Time	t_r				0.7	μs
Storage Time	t_s				4.0	μs
Fall Time	t_f				0.9	μs

Inductive Load, Clamped

Voltage Storage Time	t_{sv}	$V_{Clamp}=300\text{V}, I_C=2\text{A}, I_{B1}=0.4\text{A},$ $V_{BE(off)}=5\text{V}, T_c=100^\circ\text{C}$			4.0	μs
Crossover Time	t_c				0.9	μs
Fall Time	t_{fl}			0.16		μs

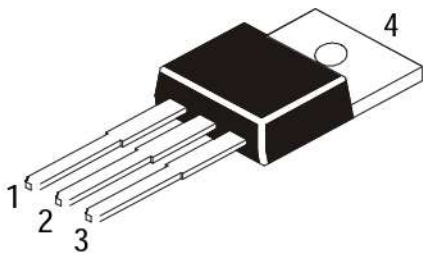
**Pulse Test: Pulse Width=300 μs , Duty Cycle $\leq 2\%$

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	

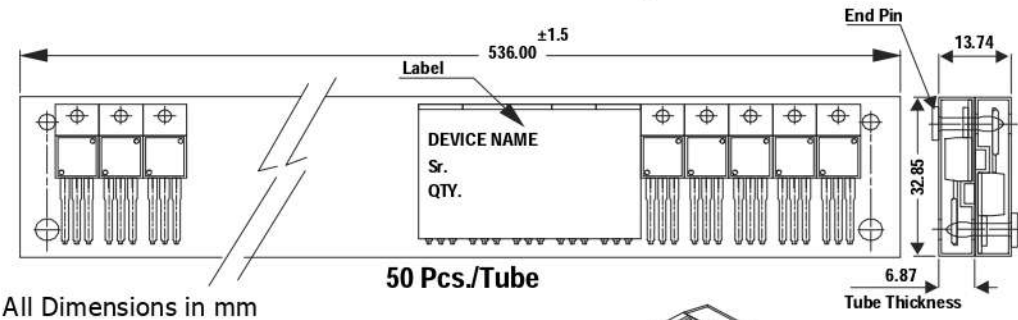
All diminsions in mm.



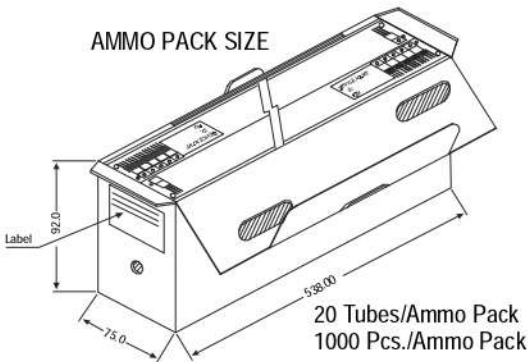
Pin Configuration

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

TO-220 Tube Packing



AMMO PACK SIZE



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

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered Trademark of
Continental Device India Limited

C-120 Naraina Industrial Area, New Delhi 110 028, India.

Telephone + 91-11-2579 6150, 5141 1112 Fax + 91-11-2579 5290, 5141 1119

email@cdil.com www.cdilsemi.com