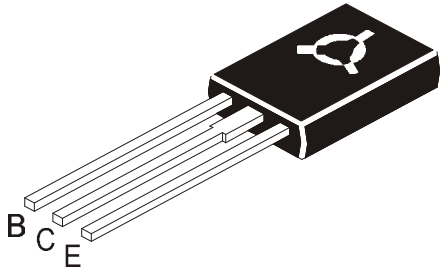


**NPN EPITAXIAL SILICON POWER TRANSISTORS**

**MJE13002  
MJE13003**

**TO-126  
Plastic Package**



**Suitable for Switching Regulators, Inverters, Motor Control Solenoid/Relay Drivers and Deflection Circuits**

**ABSOLUTE MAXIMUM RATINGS**

DESCRIPTION	SYMBOL	MJE13002	MJE13003	UNIT
Collector Emitter Voltage	$V_{CEO(sus)}$	300	400	V
Collector Emitter Voltage	$V_{CEV}$	600	700	V
Emitter Base Voltage	$V_{EBO}$		9.0	V
Collector Current Continuous	$I_C$		1.5	A
Peak	$*I_{CM}$		3.0	A
Base Current Continuous	$I_B$		0.75	A
Peak	$*I_{BM}$		1.5	A
Emitter Current Continuous	$I_E$		2.25	A
Peak	$*I_{EM}$		4.5	A
Total Power Dissipation @ $T_a=25^\circ\text{C}$	$P_D$		1.4	W
Derate Above $25^\circ\text{C}$			11.2	mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_c=25^\circ\text{C}$	$P_D$		40	W
Derate Above $25^\circ\text{C}$			320	mW/ $^\circ\text{C}$
Operating And Storage Junction Temperature Range	$T_j, T_{stg}$		- 65 to 150	$^\circ\text{C}$

**THERMAL RESISTANCE**

Junction to Case	$R_{th(j-c)}$		3.12	$^\circ\text{C/W}$
Junction to Ambient in free air	$R_{th(j-a)}$		89	$^\circ\text{C/W}$
Maximum Load Temperature for Soldering Purposes 1/8" from Case for 5 Seconds	$T_L$		275	$^\circ\text{C}$

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

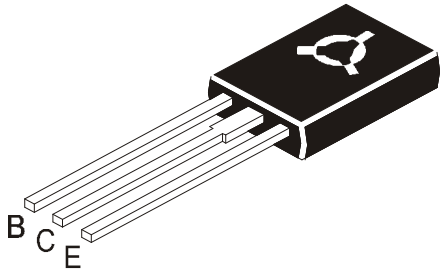
**ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$  unless specified otherwise)**

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Sustaining Voltage	$**V_{CEO(sus)}$	$I_C=10\text{mA}, I_B=0$ <b>MJE13002</b> <b>MJE13003</b>	300 400			V V
Collector Cutoff Current	$I_{CEV}$	$V_{CEV}=\text{Rated Value}, V_{BE}(\text{off})=1.5\text{V}$			1.0	mA
		$V_{CEV}=\text{Rated Value}, V_{BE}(\text{off})=1.5\text{V}, T_c=100^\circ\text{C}$			5.0	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=9\text{V}, I_C=0$			1.0	mA

# NPN SILICON POWER TRANSISTORS

MJE13002  
MJE13003

TO126  
Plastic Package



## ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
DC Current Gain	** $\eta_{FE}$	$I_C=0.5\text{A}, V_{CE}=2\text{V}$ $I_C=1\text{A}, V_{CE}=2\text{V}$	8 5		40 25	
Collector Emitter Saturation Voltage	** $V_{CE(sat)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$ $I_C=1\text{A}, I_B=0.25\text{A}$ $I_C=1.5\text{A}, I_B=0.5\text{A}$ $I_C=1\text{A}, I_B=0.25\text{A}, T_c=100^\circ\text{C}$			0.5 1.0 3.0 1.0	V V V V
Base Emitter Saturation Voltage	** $V_{BE(sat)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$ $I_C=1\text{A}, I_B=0.25\text{A}$ $I_C=1\text{A}, I_B=0.25\text{A}, T_c=100^\circ\text{C}$			1.0 1.2 1.1	V V V

## DYNAMIC CHARACTERISTICS

Transition Frequency	$f_T$	$I_C=100\text{mA}, V_{CE}=10\text{V}$ $f=1\text{MHz}$	4.0			MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$		21		pF

## Resistive Load

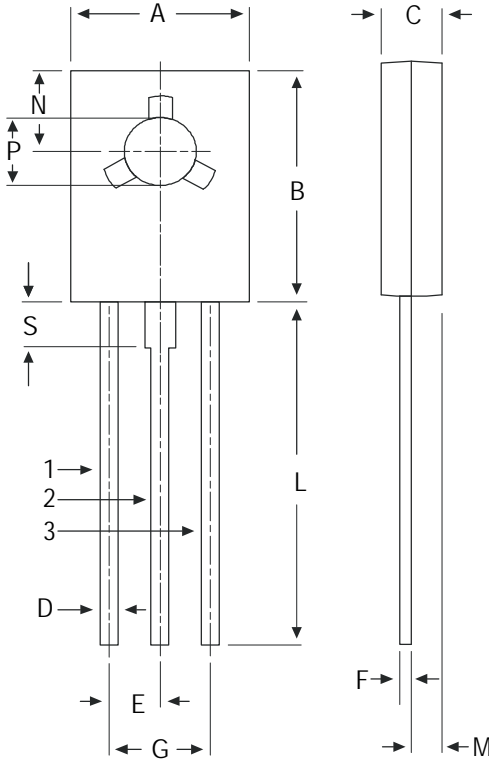
Delay Time	$t_d$	$V_{CC}=125\text{V}, I_C=1\text{A},$ $I_{B1}=I_{B2}=0.2\text{A}, t_p=25\mu\text{s}, \text{Duty}$ $\text{Cycle} \leq 1\%$			0.1	$\mu\text{s}$
Rise Time	$t_r$				1.0	$\mu\text{s}$
Storage Time	$t_s$				4.0	$\mu\text{s}$
Fall Time	$t_f$				0.7	$\mu\text{s}$

## Inductive Load, Clamped

Voltage Storage Time	$t_{sv}$	$V_{Clamp}=300\text{V}, I_C=1\text{A},$ $I_{B1}=0.2\text{A}, V_{BE(off)}=5\text{V},$ $T_c=100^\circ\text{C}$			4.00	$\mu\text{s}$
Crossover Time	$t_c$				0.75	$\mu\text{s}$
Fall Time	$t_{fi}$			0.15		$\mu\text{s}$

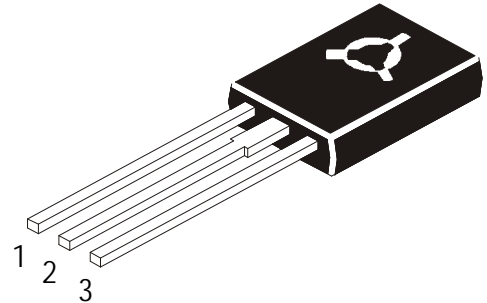
\*\*Pulse Test: Pulse Width=300ms, Duty Cycle  $\leq 2\%$

TO-126 (SOT-32) Plastic Package



DIM	MIN	MAX
A	7.4	7.8
B	10.5	10.8
C	2.4	2.7
D	0.7	0.9
E	2.25 TYP.	
F	0.49	0.75
G	4.5 TYP.	
L	15.7 TYP.	
M	1.27 TYP.	
N	3.75 TYP.	
P	3.0	3.2
S	2.5 TYP.	

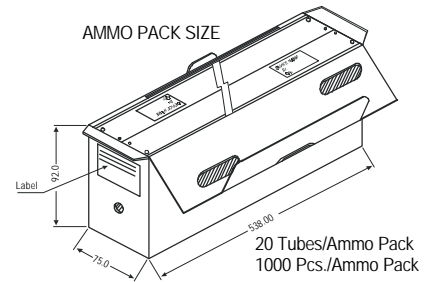
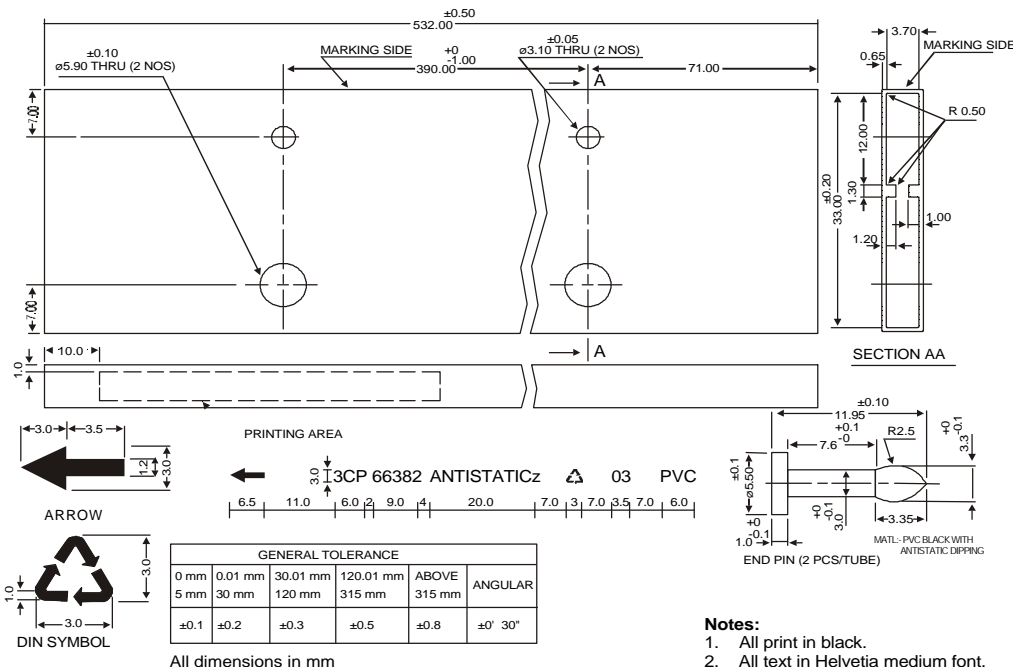
All dimensions in mm.



Pin Configuration

1. Base
2. Collector
3. Emitter

TO-126 (SOT-32) Plastic Package



Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-126 Bulk	500 pcs/polybag	340 gm/500 pcs	3" x 7.5" x 7.5"	2K	17" x 15" x 13.5"	32K	31 kgs
TO-126 Tube	50 pcs/tube	73 gm/50 pcs	3" x 3.7" x 21.5"	1K	19" x 19" x 19"	10K	15 kgs

### **Disclaimer**

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