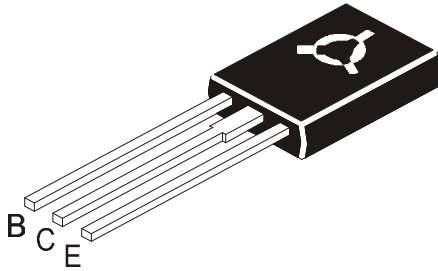


NPN EPITAXIAL SILICON POWER TRANSISTORS

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°C		11.2		mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_c=25^\circ\text{C}$	P_D	40		W
Derate Above 25°C		320		mW/ $^\circ\text{C}$
Operating And Storage Junction Temperature Range	T_j, T_{stg}	- 65 to 150		$^\circ\text{C}$

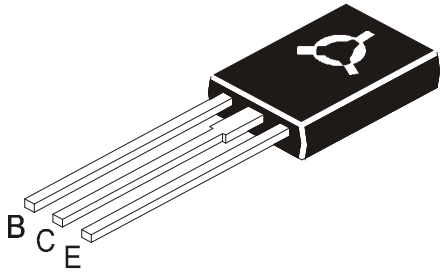
THERMAL RESISTANCE

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	$*V_{CEO(sus)}$	$I_C=10\text{mA}, I_B=0$ MJE13002 MJE13003	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

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
DC Current Gain	$^{**}h_{FE}$	$I_C=0.5\text{A}, V_{CE}=2\text{V}$	8		40	
		$I_C=1\text{A}, V_{CE}=2\text{V}$	5		25	
Collector Emitter Saturation Voltage	$^{**}V_{CE(sat)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			0.5	V
		$I_C=1\text{A}, I_B=0.25\text{A}$			1.0	V
		$I_C=1.5\text{A}, I_B=0.5\text{A}$			3.0	V
		$I_C=1\text{A}, I_B=0.25\text{A}, T_c=100^\circ\text{C}$			1.0	V
Base Emitter Saturation Voltage	$^{**}V_{BE(sat)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			1.0	V
		$I_C=1\text{A}, I_B=0.25\text{A}$			1.2	V
		$I_C=1\text{A}, I_B=0.25\text{A}, T_c=100^\circ\text{C}$			1.1	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	μs
Rise Time	t_r				1.0	μs
Storage Time	t_s				4.0	μs
Fall Time	t_f				0.7	μs

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	μs
Crossover Time	t_C				0.75	μs
Fall Time	t_{fi}			0.15		μs

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

Technical drawing of a mechanical assembly, showing a top view (left) and a side view (right). The drawing includes various dimensions labeled with letters and numbers.

Top View (Left):

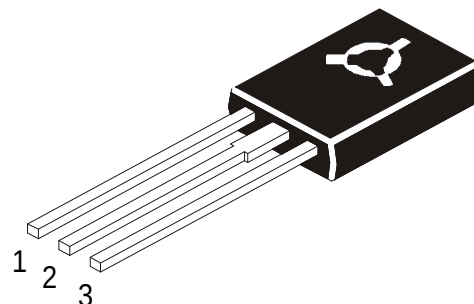
- A:** Horizontal distance from the left edge to the center of the circular feature.
- B:** Vertical distance from the top edge to the center of the circular feature.
- C:** Horizontal distance from the center of the circular feature to the right edge.
- D:** Horizontal distance from the left edge to the center of the circular feature.
- E:** Horizontal distance from the center of the circular feature to the right edge.
- F:** Horizontal distance from the left edge to the center of the circular feature.
- G:** Horizontal distance from the center of the circular feature to the right edge.
- L:** Vertical distance from the bottom edge to the center of the circular feature.
- M:** Horizontal distance from the center of the circular feature to the right edge.
- N:** Vertical distance from the top edge to the center of the circular feature.
- P:** Vertical distance from the center of the circular feature to the bottom edge.
- S:** Vertical distance from the bottom edge to the center of the circular feature.

Side View (Right):

- C:** Horizontal distance from the center of the circular feature to the right edge.
- F:** Horizontal distance from the left edge to the center of the circular feature.
- M:** Horizontal distance from the center of the circular feature to the right edge.

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

Technical drawing of a PVC pipe with a printed marking. The drawing includes a top view, a side view (SECTION AA), and a detail view of the end pin.

Top View: Shows a rectangular profile with a central hole. Dimensions include a total width of 532.00 mm, a hole diameter of ± 0.10 mm, and a marking area of 390.00 mm. The side view shows a profile with a central hole and a marking area. Dimensions include a total height of 12.00 mm, a hole diameter of ± 0.05 mm, and a marking area of 71.00 mm. The detail view shows the end pin with a central hole and a marking area. Dimensions include a total width of 11.95 mm, a hole diameter of ± 0.10 mm, and a marking area of 7.6 mm.

SECTION AA: Shows a cross-section of the pipe with a central hole. Dimensions include a total width of 12.00 mm, a hole diameter of ± 0.05 mm, and a marking area of 71.00 mm.

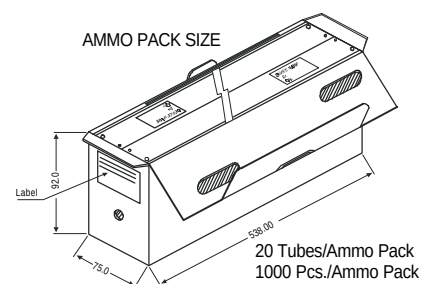
END PIN (2 PCS/TUBE): Shows a detail view of the end pin with a central hole and a marking area. Dimensions include a total width of 11.95 mm, a hole diameter of ± 0.10 mm, and a marking area of 7.6 mm.

GENERAL TOLERANCE

0 mm	0.01 mm	30.01 mm	120.01 mm	315 mm	ANGULAR
0 mm	0.01 mm	30.01 mm	120.01 mm	315 mm	ANGULAR
± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	$\pm 0' 30''$

Notes:

- All print in black.
- All text in Helvetica medium font.



Notes:

1. All print in black.
2. All text in Helvetica medium font.

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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