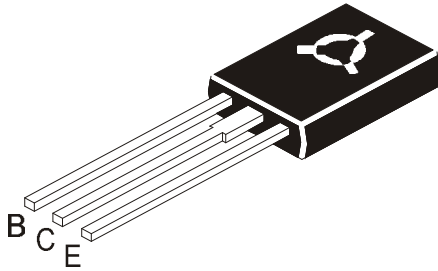


NPN EPITAXIAL SILICON POWER TRANSISTORS

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		$^\circ\text{C}$

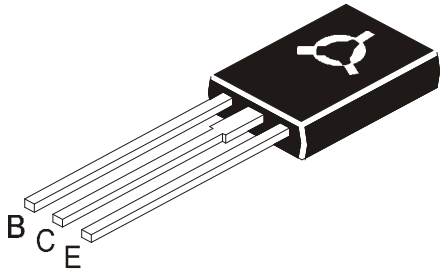
THERMAL RESISTANCE

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	$^{**}h_{FE}$	$I_C=0.5\text{A}, V_{CE}=2\text{V}$ $I_C=1\text{A}, V_{CE}=2\text{V}$	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	μs
Rise Time	t_r				1.0	μs
Storage Time	t_s				4.0	μs
Fall Time	t_f				0.7	μs

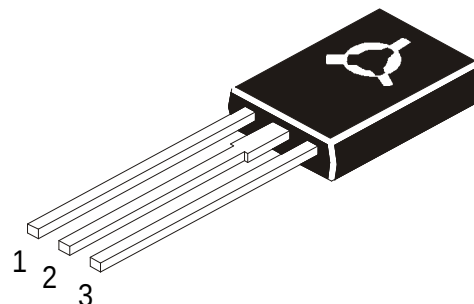
Inductive Load, Clamped

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 $\leq 2\%$

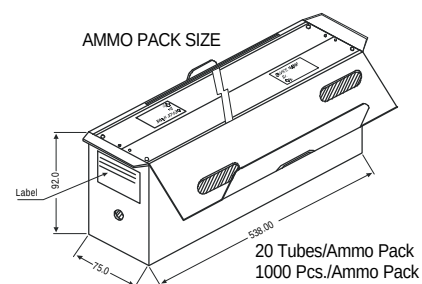
DIM	MIN	MAX
A	7.4	7.8
B	10.5	10.8
C	2.4	2.7
D	0.7	0.9
E	2.25 TYP.	
F	0.49	0.75
G	4.5 TYP.	
L	15.7 TYP.	
M	1.27 TYP.	
N	3.75 TYP.	
P	3.0	3.2
S	2.5 TYP.	

All dimensions in mm.



Pin Configuration

1. Base
2. Collector
3. Emitter

[illegible]

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

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).

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