

MJE13002 / MJE13003

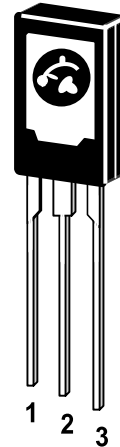
NPN Silicon Power Transistors

These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical.

They are particularly suited for 115 and 220V SWITCHMODE applications such as Switching Regulator's, Inverters, Motor Controls, Solenoid / Relay drivers and Deflection circuits.

SPECIFICATION FEATURES:

- Reverse Biased SOA with Inductive Loads $T_C=100^{\circ}\text{C}$
- Inductive Switching Matrix 0.5 to 1.5 Amp, 25 and 100°C
 t_c @ 1A, 100°C is 290 ns (Typ).
- 700V Blocking Capability
- SOA and Switching Applications Information.



1. Emitter 2. Base 3. Collector

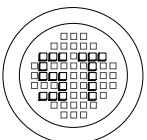
TO-225AA Package

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

	Symbol	Value		Unit
		MJE13002	MJE13003	
Collector Emitter Voltage	$V_{CEO(sus)}$	300	400	Vdc
Collector Emitter Voltage	V_{CEV}	600	700	Vdc
Emitter Base Voltage	V_{EBO}	9		Vdc
Collector Current - Continuous	I_C	1.5		Adc
- Peak ¹⁾	I_{CM}	3		
Base Current - Continuous	I_B	0.75		Adc
- Peak ¹⁾	I_{BM}	1.5		
Emitter Current - Continuous	I_E	2.25		Adc
- Peak ¹⁾	I_{EM}	4.5		
Total Power Dissipation @ $T_A=25^{\circ}\text{C}$	P_D	1.4		Watts
Derate above 25°C		11.2		mW/ $^{\circ}\text{C}$
Total Power Dissipation @ $T_C=25^{\circ}\text{C}$	P_D	40		Watts
Derate above 25°C		320		mW/ $^{\circ}\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_S	-65 to +150		$^{\circ}\text{C}$
Thermal Resistance ,Junction to Ambient	$R_{\theta JA}$	89		$^{\circ}\text{C}/\text{W}$
Thermal Resistance ,Junction to Case	$R_{\theta JC}$	3.12		$^{\circ}\text{C}/\text{W}$
Maximum Load Temperature for Soldering Purposes:1/8" from Case for 5 Seconds	T_L	275		$^{\circ}\text{C}$

1) Pulse Test: Pulse Width=5ms, Duty Cycle \leq 10%.

G S P FORM A IS AVAILABLE



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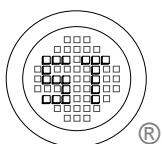
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Characteristics at Ta=25 °C

	Symbol	Min.	Typ.	Max.	Unit		
DC Current Gain at V _{CE} =2Vdc, I _C =0.5Adc at V _{CE} =2Vdc, I _C =1Adc	h_{FE} h_{FE}	8 5	- -	40 25	- -		
Collector Emitter Sustaining Voltage at I _C =10mA	MJE13002 MJE13003 $V_{CEO(sus)}$ $V_{CEO(sus)}$	300 400	- -	- -	Vdc Vdc		
Collector Cutoff Current at V _{CEV} =Rated Value, V _{BE(off)} =1.5Vdc at V _{CEV} =Rated Value, V _{BE(off)} =1.5Vdc, T _C =100°C	I_{CEV} I_{CEV}	- -	- -	1 5	mAdc mAdc		
Emitter Cutoff Current at V _{EB} =9Vdc	I_{EBO}	-	-	1	mAdc		
Collector Emitter Saturation Voltage at I _C =0.5Adc, I _B =0.1Adc at I _C =1Adc, I _B =0.25Adc at I _C =1.5Adc, I _B =0.5Adc at I _C =1Adc, I _B =0.25Adc, T _C =100°C	$V_{CE(sat)}$ $V_{CE(sat)}$ $V_{CE(sat)}$ $V_{CE(sat)}$	- - - -	- - - -	0.5 1 3 1	Vdc Vdc Vdc Vdc		
Base Emitter Saturation Voltage at I _C =0.5Adc, I _B =0.1Adc at I _C =1Adc, I _B =0.25Adc at I _C =1Adc, I _B =0.25Adc, T _C =100°C	$V_{BE(sat)}$ $V_{BE(sat)}$ $V_{BE(sat)}$	- - -	- - -	1 1.2 1.1	Vdc Vdc Vdc		
Current Gain Bandwidth Product at V _{CE} =10Vdc, I _C =100mAdc, f=1MHz	f_T	4	10	-	MHz		
Output Capacitance at V _{CB} =10Vdc, f=0.1MHz	C_{ob}	-	21	-	pF		
Delay Time	(V _{CC} =125Vdc, I _C =1A, I _{B1} =I _{B2} =0.2A, t _p =25μs, Duty Cycle≤1%)	t_d	-	0.05	0.1	μs	
Rise Time		t_r	-	0.5	1	μs	
Storage Time		t_s	-	2	4	μs	
Fall Time		t_f	-	0.4	0.7	μs	
Storage Time		(I _C =1A, V _{clamp} =300Vdc, I _{B1} =0.2A, V _{BE(off)} =5Vdc, T _C =100°C)	t_{sv}	-	1.7	4	μs
Crossover Time		t_c	-	0.29	0.75	μs	
Fall Time		t_{fi}	-	0.15	-	μs	

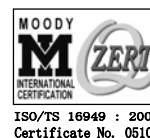
1) Pulse Test: Pulse Width=300μs, Duty Cycle≤2%.

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ISO/TS 16949 : 2002
Certificate No. 05103



ISO 14001
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ISO 9001 : 2000
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