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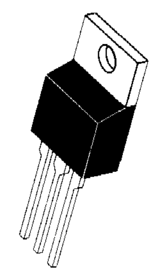
MJE1320

POWER TRANSISTOR
2 AMPERES
900 VOLTS
80 WATTS



TO–220AB

NPN Silicon Power Transistor
Switchmode Series

This transistor is designed for high–voltage, power switching in inductive circuits where RBSOA and breakdown voltage are critical. They are particularly suited for line–operated switchmode applications.

Typical Applications:
- Fluorescent Lamp Ballasts
- Inverters
- Solenoid and Relay Drivers
- Motor Controls
- Deflection Circuits

Features:
- High V_{CEV} Capability (1800 Volts)
- Low Saturation Voltage
- 100°C Performance Specified for:
  - Reverse–Biased SOA with Inductive Loads
  - Switching Times with Inductive Loads
  - Saturation Voltages
  - Leakage Currents

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO(sus)}$	900	Vdc
Collector–Emitter Voltage	V_{CEV}	1800	Vdc
Emitter Base Voltage	V_{EB}	9	Vdc
Collector Current — Continuous Peak(1)	I_C I_{CM}	2 5	Adc
Base Current — Continuous Peak(1)	I_B I_{BM}	1.5 2.5	Adc
Total Power Dissipation @ T_C = 25°C @ T_C = 100°C Derate above 25°C	P_D	80 32 0.64	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.56	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8″ from Case for 5 Seconds	T_L	275	°C

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle ≤ 10%.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (I_C = 50 mA, I_B = 0)	$V_{CEO(sus)}$	900	—	—	Vdc
Collector Cutoff Current (V_{CEV} = Rated Value, $V_{BE(off)}$ = 1.5 Vdc) (V_{CEV} = Rated Value, $V_{BE(off)}$ = 1.5 Vdc, T_C = 100°C)	I_{CEV}	 — —	 — —	 0.25 2.5	mAdc
Emitter Cutoff Current (V_{EB} = 9 Vdc, I_C = 0)	I_{EBO}	—	—	0.25	mAdc
SECOND BREAKDOWN					
Second Breakdown Collector Current with base forward biased	$I_{S/b}$	See Figure 13			
Clamped Inductive SOA with Base Reverse Biased	RBSOA	See Figure 14			
ON CHARACTERISTICS(1)					
DC Current Gain (V_{CE} = 5 Vdc) I_C = 2 Adc I_C = 1 Adc	h_{FE}	2.5 3	4.5 7	— —	— —
Collector–Emitter Saturation Voltage (I_C = 1 Adc, I_B = 0.5 Adc) (I_C = 2 Adc, I_B = 1 Adc) (I_C = 1 Adc, I_B = 0.5 Adc, T_C = 100°C)	$V_{CE(sat)}$	 — — —	 0.18 0.3 0.3	 1 2.5 1.5	Vdc
Base–Emitter Saturation Voltage (I_C = 1 Adc, I_B = 0.5 Adc) (I_C = 2 Adc, I_B = 1 Adc) (I_C = 1 Adc, I_B = 0.5 Adc, T_C = 100°C)	$V_{BE(sat)}$	 — — —	 0.2 0.9 0.15	 1.5 2.8 1.5	Vdc
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)	C_{ob}	—	80	—	pF
SWITCHING CHARACTERISTICS					
Resistive Load (Table 1)					
Delay Time (V_{CC} = 250 Vdc, I_C = 1 A, I_{B1} = I_{B2} = 0.5 Adc, t_p = 25 µs, Duty Cycle ≤ 2%)	t_d	—	0.1	—	µs
Rise Time	t_r	—	0.8	—	µs
Storage Time	t_s	—	4	—	µs
Fall Time	t_f	—	0.8	—	µs
Inductive Load, Clamped (Table 2)					
Storage Time (I_C = 1 A, V_{clamp} = 400 Vdc, $V_{BE(off)}$ = 2 Vdc, I_{B1} = 0.5 Adc) T_C = 25°C	t_{sv}	—	2.8	—	µs
Crossover Time T_C = 25°C	t_c	—	2.2	—	µs
Storage Time T_C = 100°C	t_{sv}	—	3.7	10.5	µs
Crossover Time T_C = 100°C	t_c	—	3.5	10	µs
Fall Time					

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