New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

MJE5850
MJE5851*
MJE5852*

*Motorola Preferred Device

SWITCHMODE Series
PNP Silicon Power Transistors

8 AMPERE
PNP SILICON
POWER TRANSISTORS
300, 350, 400 VOLTS
80 WATTS

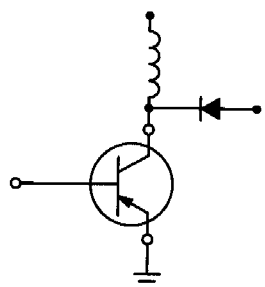
The MJE5850, MJE5851 and the MJE5852 transistors are designed for high–voltage, high–speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switchmode applications such as:

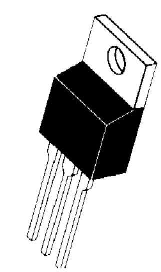
- Switching Regulators
- Inverters
- Solenoid and Relay Drivers
- Motor Controls
- Deflection Circuits

Fast Turn–Off Times
    100 ns Inductive Fall Time @ 25°C (Typ)
    125 ns Inductive Crossover Time @ 25°C (Typ)

Operating Temperature Range –65 to +150°C

100°C Performance Specified for:
    Reversed Biased SOA with Inductive Loads
    Switching Times with Inductive Loads
    Saturation Voltages
    Leakage Currents





TO–220AB

MAXIMUM RATINGS

Rating	Symbol	MJE5850	MJE5851	MJE5852	Unit
Collector–Emitter Voltage	$V_{CEO(sus)}$	300	350	400	Vdc
Collector–Emitter Voltage	V_{CEV}	350	400	450	Vdc
Emitter Base Voltage	V_{EB}	6.0			Vdc
Collector Current — Continuous Peak (1)	I_C I_{CM}	8.0 1 6			Adc
Base Current — Continuous Peak (1)	I_B I_{BM}	4.0 8.0			Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	80 0.640			Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to 150			°C

THERMAL CHARACTERISTICS

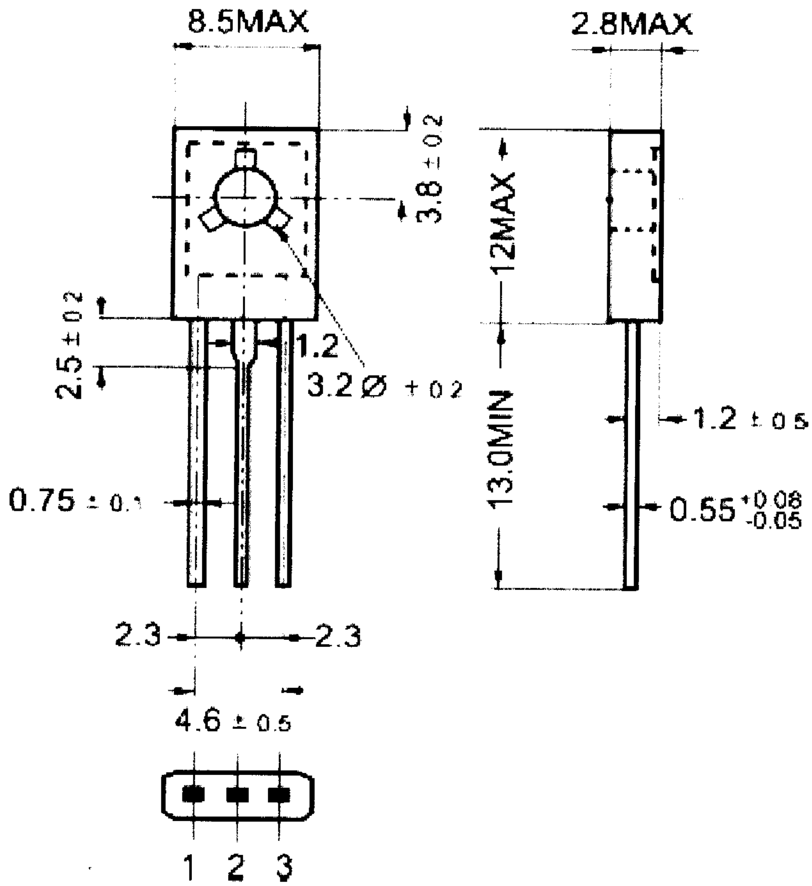
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.25	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8″ from Case for 5 Seconds	T_L	275	°C

(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 = 10 mA, I_B = 0)	MJE5850 MJE5851 MJE5852	$V_{CEO(sus)}$	300 350 400	— —	— —	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}	— —	— —	0.5 2.5	mAdc
Collector Cutoff Current (V_{CE} = Rated V_{CEV}, R_{BE} = 50 Ω, T_C = 100°C)		I_{CER}	—	—	3.0	mAdc
Emitter Cutoff Current (V_{EB} = 6.0 Vdc, I_C = 0)		I_{EBO}	—	—	1.0	mAdc
SECOND BREAKDOWN						
Second Breakdown Collector Current with base forward biased		$I_{S/b}$	See Figure 12			
Clamped Inductive SOA with base reverse biased		RBSOA	See Figure 13			
***ON CHARACTERISTICS**						
DC Current Gain (I_C = 2.0 Adc, V_{CE} = 5 Vdc) (I_C = 5.0 Adc, V_{CE} = 5 Vdc)		h_{FE}	15 5	— —	— —	—
Collector–Emitter Saturation Voltage (I_C = 4.0 Adc, I_B = 1.0 Adc) (I_C = 8.0 Adc, I_B = 3.0 Adc) (I_C = 4.0 Adc, I_B = 1.0 Adc, T_C = 100°C)		$V_{CE(sat)}$	— — —	— — —	2.0 5.0 2.5	Vdc
Base–Emitter Saturation Voltage (I_C = 4.0 Adc, I_B = 1.0 Adc) (I_C = 4.0 Adc, I_B = 1.0 Adc, T_C = 100°C)		$V_{BE(sat)}$	— —	— —	1.5 1.5	Vdc
DYNAMIC CHARACTERISTICS						
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1.0 kHz)		C_{ob}	—	270	—	pF
SWITCHING CHARACTERISTICS						
Resistive Load (Table 1)						
Delay Time	(V_{CC} = 250 Vdc, I_C = 4.0 A, I_{B1} = 1.0 A, t_p = 50 μs, Duty Cycle ≤ 2%)	t_d	—	0.025	0.1	μs
Rise Time		t_r	—	0.100	0.5	μs
Storage Time	(V_{CC} = 250 Vdc, I_C = 4.0 A, I_{B1} = 1.0 A, $V_{BE(off)}$ = 5 Vdc, t_p = 50 μs, Duty Cycle ≤ 2%)	t_s	—	0.60	2.0	μs
Fall Time		t_f	—	0.11	0.5	μs
Inductive Load, Clamped (Table 1)						
Storage Time	(I_{CM} = 4 A, V_{CEM} = 250 V, I_{B1} = 1.0 A, $V_{BE(off)}$ = 5 Vdc, T_C = 100°C)	t_{sv}	—	0.8	3.0	μs
Crossover Time		t_c	—	0.4	1.5	μs
Fall Time		t_{fi}	—	0.1	—	μs
Storage Time	(I_{CM} = 4 A, V_{CEM} = 250 V, I_{B1} = 1.0 A, $V_{BE(off)}$ = 5 Vdc, T_C = 25°C)	t_{sv}	—	0.5	—	μs
Crossover Time		t_c	—	0.125	—	μs
Fall Time		t_{fi}	—	0.1	—	μs

* Pulse Test: PW = 300 μs. Duty Cycle ≤ 2%


8.5MAX
2.8MAX
3.8 ± 0.2
12MAX
2.5 ± 0.2
1.2
3.2Ø + 0.2
13.0MIN
1.2 ± 0.5
0.75 ± 0.1
0.55 +0.08 -0.05
2.3
2.3
4.6 ± 0.5
1 2 3