New Jersey Semi-Conductor Products, Inc.

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SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage,high-speed,power switching in inductive circuit, they are particularly suited for 115 and 220 V switchmode applications such as switching regulator's,inverters,DC -DC conveter, Motor controls, Solenoild / Relay drivers and Deflection circuits.

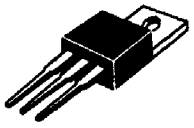
NPN

MJE13004
MJE13005

4 AMPERE
POWER
TRANASISTORS
300-400 VOLTS
75 WATTS

FEATURES:

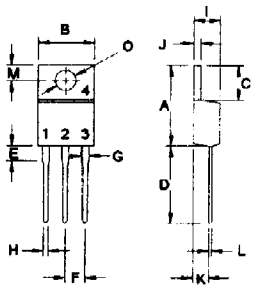
*Collector-Emitter Sustaining Voltage-
$V_{CEO(SUS)}$ = 400 V and 300 V
* Collector-Emitter Saturation Voltage -
$V_{CE(sat)}$ = 1.0 V (Max.) @ I_C = 4.0 A, I_B = 1.0 A
* Switching Time - t_f =0.9 us (Max.) @ I_C =2.0 A



TO-220

MAXIMUM RATINGS

Characteristic	Symbol	MJE13004	MJE13005	Unit
Collector-Emitter Voltage	V_{CEO}	300	400	V
Collector-Emitter Voltage	V_{CEV}	600	700	V
Emitter-Base Voltage	V_{EBO}	9.0		V
Collector Current - Continuous - Peak	I_C I_{CM}	4.0 8.0		A
Base current	I_B	2.0		A
Total Power Dissipation @T_C = 25°C Derate above 25°C	P_D	75 0.6		W W/°C
Operating and Storage Junction Temperature Range	T_J , T_{STG}	-65 to +150		°C

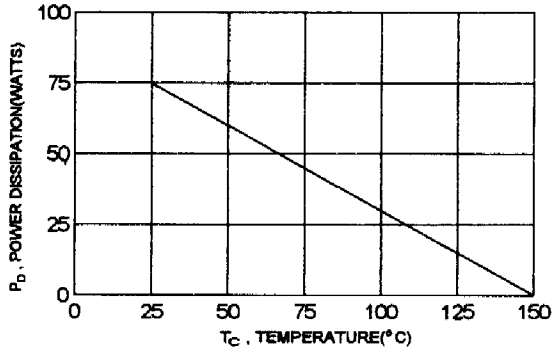


PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	1.67	°C/W

FIGURE -1 POWER DERATING



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (I_C= 10 mA, I_B= 0) MJE13004 / MJE13005	$V_{CEO(sus)}$	300 / 400		V
Collector Cutoff Current (V_{CEV}= Rated Value, $V_{BE(off)}$=1.5 V)	I_{CEV}		1.0	mA
(V_{CEV}= Rated Value, $V_{BE(off)}$=1.5 V , T_C=100 °C)			5.0	
Emitter Cutoff Current (V_{EB}= 9.0 V, I_C= 0)	I_{EBO}		1.0	mA
ON CHARACTERISTICS (1)				
DC Current Gain (I_C= 1.0 A, V_{CE}= 5.0 V)	hFE	10	60	
(I_C= 2.0 A, V_{CE}= 5.0 V)		8.0	40	
Collector-Emitter Saturation Voltage (I_C= 1.0 A, I_B= 200 mA)	$V_{CE(sat)}$		0.5	V
(I_C= 2.0 A, I_B= 500 mA)			0.6	
(I_C= 4.0 A, I_B= 1.0 A)			1.0	
Base-Emitter Saturation Voltage (I_C= 1.0 A, I_B= 200 mA)	$V_{BE(sat)}$		1.2	V
(I_C= 2.0 A, I_B= 500 mA)			1.6	
DYNAMIC CHARACTERISTICS				
Current Gain - Bandwidth Product (I_C = 500 mA , V_{CE} = 10 V ,f = 1.0 MHz)	f_T	4.0		MHz

SWITCHING CHARACTERISTICS

Delay Time	V_{CC} = 125 V, I_C = 2.0 A	t_d		0.1	us
Rise Time	I_{B1} = -I_{B2} =0.4A,	t_r		0.7	us
Storage Time	tp = 25 us,Duty Cycle ≦1.0%	t_s		4.0	us
Fall Time		t_f		0.9	us

(1) Pulse Test: Pulse Width =300 us,Duty Cycle ≦ 2.0%

TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151

