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

POWER TRANSISTORS

7 Amp, 400V, Triple Diffused NPN Mesa

2N6510
2N6511
2N6512
2N6513
2N6514

FEATURES

- Collector-Base Voltage: up to 400V
- Peak Collector Current: 10A
- Rise Time: $\leqslant 1.5\mu s$ } @ $I_C = 4A$
- Fall Time: $\leqslant 1.5\mu s$ }

DESCRIPTION

These high voltage triple diffused glass passivated power transistors combine fast switching, low saturation voltage and rugged $E_{s/b}$ capability. They are designed for use in off-line power supplies, high voltage inverters, switching regulators, ignition systems and deflection circuits.

ABSOLUTE MAXIMUM RATINGS

	2N6510	2N6511	2N6512	2N6513	2N6514
*Collector Base Voltage, V_{CPO}	250V	300V	350V	400V	350V
Collector-Emitter Sustaining Voltage, $V_{CER\ (sus)}$ (1)	250V	300V	350V	400V	350V
*Collector-Emitter Sustaining Voltage, $V_{CEO\ (sus)}$	200V	250V	300V	350V	300V
*Emitter-Base Voltage, V_{EBO}	6V	6V	6V	6V	6V
*Collector Current, I_C continuous	7A	7A	7A	7A	7A
*Base Current, I_B	10A	10A	10A	10A	10A
*Emitter Current, I_E	3A	3A	3A	3A	3A
*Power Dissipation, P_T 25°C Case	120W	120W	120W	120W	120W
*Operating and Storage Temperature Range	−65 to +200°C				

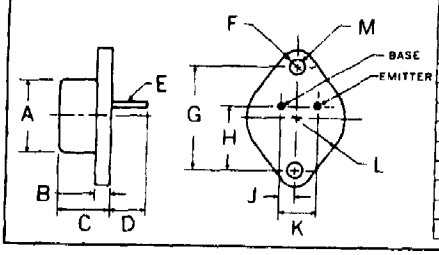
(1) $R_{BE} = 50\Omega$

*JEDEC registered values

MECHANICAL SPECIFICATIONS

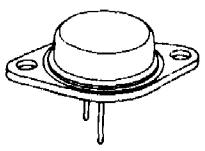
NOTE:
Leads may be soldered to within 1/16" of base provided temperature-time exposure is less than 260°C for 10 seconds.

2N6510 2N6511 2N6512 2N6513 2N6514



	ins.	mm.
A	.875 MAX.	22.23 MAX.
B	.135 MAX.	3.43 MAX.
C	.250-.450	6.35-11.43
D	.312 MIN.	7.92 MIN.
E	.038-.043 DIA.	0.97-1.09 DIA.
F	.188 MAX. RAD.	4.78 MAX. RAD.
G	1.177-1.197	29.90-30.40
H	.655-.675	16.64-17.15
J	.205-.225	5.21-5.72
K	.420-.440	10.67-11.18
L	.525 MAX. RAD.	13.34 MAX. RAD.
M	.151-.161 DIA.	3.84-4.09 DIA.

TO-3



ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

Test	Symbol	2N6510 Min.	2N6510 Max.	2N6514 Min.	2N6514 Max.	Units	Test Conditions
*D.C. Current Gain (Note 1)	h_{FE}	10	50	—	—		$I_C = 3A, V_{CE} = 3V$
		—	—	10	50		$I_C = 5A, V_{CE} = 3V$
*Collector Saturation Voltage (Note 1)	$V_{CE(sat)}$	—	1.5	—	—	V	$I_C = 3A, I_B = 0.6A$
		—	—	—	1.5		$I_C = 5A, I_B = 1A$
		—	2.5	—	2.5		$I_C = 7A, I_B = 3A$
*Base Saturation Voltage (Note 1)	$V_{BE(sat)}$	—	1.7	—	—	V	$I_C = 3A, I_B = 0.6A$
		—	—	—	1.7		$I_C = 5A, I_B = 1A$
Collector-Emitter Sustaining Voltage (Note 2)	$V_{CEO(sus)}$	200*	—	300*	—	V	$I_C = 0.2A$
	$V_{CER(sus)}$	250	—	350	—	V	$I_C = 0.2A, R_{BE} = 50\Omega$
*Collector Cutoff Current	I_{CEV}	—	5.0	—	—	mA	$V_{CE} = 250V, V_{BE} = -1.5V$
		—	—	—	5.0		$V_{CE} = 350V, V_{BE} = -1.5V$
*Collector Cutoff Current 100°C	I_{CEV}	—	10	—	—	mA	$V_{CE} = 250V, V_{BE} = -1.5V$
		—	—	—	10		$V_{CE} = 350V, V_{BE} = -1.5V$
*Switching Speeds							
Delay Time	t_d	—	0.2	—	—	μS	$V_{CC} = 200V$
Rise Time	t_r	—	1.5	—	—		$I_C = 3A$
Storage Time	t_s	—	5.0	—	—		$I_{B1} = I_{B2} = 0.6A$
Fall Time	t_f	—	1.5	—	—		
Delay Time	t_d	—	—	—	0.2	μS	$V_{CC} = 200V$
Rise Time	t_r	—	—	—	1.5		$I_C = 5A$
Storage Time	t_s	—	—	—	5.0		$I_{B1} = I_{B2} = 1A$
Fall Time	t_f	—	—	—	1.5		

ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

Test	Symbol	2N6511 Min.	2N6511 Max.	2N6512 Min.	2N6512 Max.	2N6513 Min.	2N6513 Max.	Units	Test Conditions
*D.C. Current Gain (Note 1)	h_{FE}	10	50	10	50	10	50		$I_C = 4A, V_{CE} = 3V$
*Collector Saturation Voltage (Note 1)	$V_{CE(sat)}$	—	1.5	—	1.5	—	1.5	V	$I_C = 4A, I_B = 0.8A$
		—	2.5	—	2.5	—	2.5		$I_C = 7A, I_B = 3A$
*Base Saturation Voltage (Note 1)	$V_{BE(sat)}$	—	1.7	—	1.7	—	1.7	V	$I_C = 4A, I_B = 0.8A$
Collector-Emitter Sustaining Voltage (Note 2)	$V_{CEO(sus)}$	250	—	300	—	350	—	V	$I_C = 0.2A$
	$V_{CER(sus)}$	300	—	350	—	400	—	V	$I_C = 0.2A, R_{BE} = 50\Omega$
*Collector Cutoff Current	I_{CEV}	—	5.0	—	—	—	—	mA	$V_{CE} = 300V, V_{BE} = -1.5V$
		—	—	—	5.0	—	—		$V_{CE} = 350V, V_{BE} = -1.5V$
		—	—	—	—	—	5.0		$V_{CE} = 400V, V_{BE} = -1.5V$
*Collector Cutoff Current, 100°C	I_{CEV}	—	10	—	—	—	—	mA	$V_{CE} = 300V, V_{BE} = -1.5V$
		—	—	—	10	—	—		$V_{CE} = 300V, V_{BE} = -1.5V$
		—	—	—	—	—	10		$V_{CE} = 400V, V_{BE} = -1.5V$
*Switching Speeds									
Delay Time	t_d	—	0.2	—	0.2	—	0.2	μS	$V_{CC} = 200V$
Rise Time	t_r	—	1.5	—	1.5	—	1.5		$I_C = 4A$
Storage Time	t_s	—	5.0	—	5.0	—	5.0		$I_{B1} = I_{B2} = 0.8A$
Fall Time	t_f	—	1.5	—	1.5	—	1.5		

Notes:
1. Pulse width = 250μS; duty cycle ≤1%.
2. Sustaining Voltage. Measured at a high current point where collector-emitter voltage is lowest. Current pulse length = 50μS; duty cycle ≤ 1%. Voltage clamped at maximum collector-emitter voltage.

* JEDEC registered values.