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

20 Amp, 150 V, Double Diffused NPN Mesa

2N6354
2N6496

FEATURES
- Collector-Base Voltage: up to 150V
- Peak Collector Current: 30A
- Rise Time: ≤ 500ns
- Fall Time: ≤ 500ns
  @ I_C up to 12A

DESCRIPTION
These double diffused glass passivated mesa power transistors combine fast-switching, low saturation voltage and rugged $E_{s/b}$ capability. They are designed for use in switching regulators, converters, inverters and switching-control amplifiers.

ABSOLUTE MAXIMUM RATINGS*

	2N6354	2N6496
Collector-Base Voltage, V_{CBO}	150V	150V
Collector-Emitter Sustaining Voltage, $V_{CER\ (SUS)}$ (1)	—	130V
$V_{CEO\ (SUS)}$	120V	110V
Emitter-Base Voltage, V_{EBO}	6.5V	7V
Collector Current, I_C continuous	10A	15A
Collector Current, I_{CM} peak	12A	—
Base Current, I_B continuous	5A	5A
Power Dissipation, 25°C Case	140W	140W
Operating and Storage Temperature Range	−65 to 200°C	

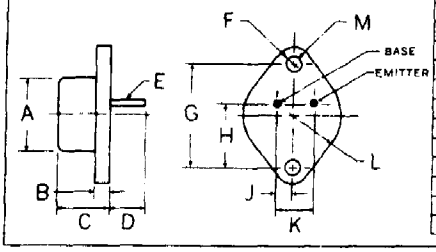
(1) With $R_{BE} \leq 50\Omega$

* JEDEC registered values.

MECHANICAL SPECIFICATIONS

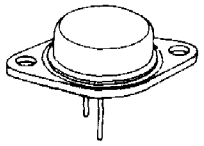
NOTE:
Leads may be soldered to within 1/16" of base provided temperature-time exposure is less than 260°C for 10 seconds.

2N6354, 2N6496



	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	2N6354		2N6496		Units	Test Conditions
		MIN.	MAX.	MIN.	MAX.		
D.C. Current Gain (Note 1)	h_{FE}	—	—	—	—		$I_C = 2A, V_{CE} = 5V$
		20	150	—	—		$I_C = 5A, V_{CE} = 2V$
D.C. Current Gain (Note 1)	h_{FE}	—	—	12	100		$I_C = 8A, V_{CE} = 2V$
		10	100	—	—		$I_C = 10A, V_{CE} = 2V$
D.C. Current Gain (Note 1)	h_{FE}	—	—	—	—		$I_C = 10A, V_{CE} = 5V$
		—	—	—	—		$I_C = 12A, V_{CE} = 5V$
Collector Saturation Voltage (Note 1)	$V_{CE\ (sat)}$	—	0.5	—	—	V	$I_C = 5A, I_B = .5A$
		—	—	—	1.0		$I_C = 8A, I_B = .8A$
Collector Saturation Voltage (Note 1)	$V_{CE\ (sat)}$	—	1.0	—	—	V	$I_C = 10A, I_B = 1.0A$
Collector Saturation Voltage (Note 1)	$V_{CE\ (sat)}$	—	—	—	—	V	$I_C = 12A, I_B = 1.2A$
		—	—	—	—		$I_C = 20A, I_B = 5A$
Base Saturation Voltage (Note 1)	$V_{BE\ (sat)}$	—	1.3*	—	—	V	$I_C = 5A, I_B = 0.5A$
		—	—	—	2.0		$I_C = 8A, I_B = 0.8A$
Base Saturation Voltage (Note 1)	$V_{BE\ (sat)}$	—	2.0	—	—	V	$I_C = 10A, I_B = 1A$
		—	—	—	—	V	$I_C = 20A, I_B = 5A$
Collector-Emitter Sustaining Voltage (Note 2)	$V_{CEO\ (sus)}$	120	—	100	—	V	$I_C = 0.2A$
Collector-Emitter Sustaining Voltage (Note 2)	$V_{CEX\ (sus)}$	—	—	—	—	V	$I_C = 0.2A$ $V_{BE} = -1.5V$ $I_B = 0$ $R_{BE} = 100\ \Omega$
Collector-Emitter Sustaining Voltage (Note 2)	$V_{CER\ (sus)}$	—	—	130	—	V	$R_{BE} = 50\ \Omega, I_C = 0.2A$
		130	—	—	—		$R_{BE} = 100\ \Omega, I_C = 0.2A$
Emitter-Base Voltage	V_{EBO}	6.5	—	—	—	V	$I_E = 5mA$
		—	—	7.0	—		$I_E = 50mA$
Collector Cutoff Current	I_{CBO}	—	5	—	—	mA	$V_{CB} = 150V$
Collector Cutoff Current	I_{CEO}	—	—	—	—	mA	$V_{CE} = 55V$
		—	—	—	—		$V_{CE} = 70V$
		—	20	—	—		$V_{CE} = 100V$
Collector Cutoff Current	I_{CEV}	—	—	—	—	mA	$V_{CE} = 110V, V_{BE} = -1.5V$
		—	—	—	20		$V_{CE} = 130V, V_{BE} = 0$
		—	—	—	—		$V_{CE} = 140V, V_{BE} = -1.5V$
		—	10	—	—		$V_{CE} = 140V, V_{BE} = 0$
Collector Cutoff Current, 125°C	I_{CEV}	—	20	—	—	mA	$V_{CE} = 140V$
Collector Cutoff Current, 150°C	I_{CEV}	—	—	—	—	mA	$V_{CE} = 85V, V_{BE} = -1.5V$
		—	—	—	—		$V_{CE} = 100V, V_{BE} = -1.5V$
		—	—	—	25		$V_{CE} = 130V, V_{BE} = 0V$
Emitter Cutoff Current	I_{EBO}	—	—	—	—	mA	$V_{BE} = -5V$
		—	5.0	—	—		$V_{BE} = -6.5V$
		—	—	—	50		$V_{BE} = -7V$
Magnitude of Small Signal Forward — Current Transfer Ratio	$\lvert h_{fe} \rvert$	—	—	12	—		$V_{CE} = 10V, I_C = 2A, f = 5\ MHz$
		8.0	—	—	—		$V_{CE} = 10V, I_C = 1A, f = 10\ MHz$
Collector Capacitance	C_{ob}	—	300	—	300	pF	$V_{CB} = 10V, f = 1\ MHz$
Thermal Resistance: Junction-to-Case	$R_{\theta JC}$	—	—	—	1.25	°C/W	$V_{CE} = 10V, I_C = 10A$
		—	1.25	—	—		$V_{CE} = 20V, I_C = 1A$

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.