New Jersey Semi-Conductor Products, Inc.

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Power Field Effect Transistor

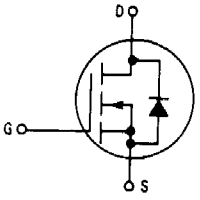
N-Channel Enhancement-Mode Silicon Gate TMOS

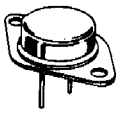
BUZ84
BUZ84A

TMOS POWER MOSFETs
5.3 and 6 AMPERES
$r_{DS(on)}$ = 1.5 and 2 OHMS
800 VOLTS

These TMOS Power FETs are designed for high voltage, high speed power switching applications such as switching regulators, converters, motor controls, solenoid and relay drivers.

- Silicon Gate for Fast Switching Speeds
- Rugged — SOA is Power Dissipation Limited
- Source-to-Drain Diode Characterized for Use With Inductive Loads
- Low Drive Requirement — $V_{GS(th)}$ = 4 V max





MAXIMUM RATINGS

Rating	Symbol	BUZ84	BUZ84A	Unit
Drain-Source Voltage	V_{DSS}	800		Vdc
Drain-Gate Voltage (R_{GS} = 20 kΩ)	V_{DGR}	800		Vdc
Gate-Source Voltage	V_{GS}	±20		Vdc
Drain Current Continuous T_C = 25°C T_C = 100°C Pulsed	I_D I_{DM}	5.3 3.3 21	6 3.8 24	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	125 1		Watts W/°C
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to 150		°C

THERMAL CHARACTERISTICS

Thermal Resistance Junction to Case Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1 35	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T_L	300	°C

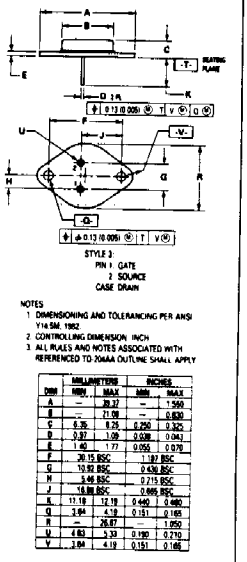
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage (V_{GS} = 0, I_D = 1 mA)	$V_{BR(DSS)}$	800	—	—	Vdc
Zero Gate Voltage Drain Current (V_{DSS} = 800 V, V_{GS} = 0) (T_J = 125°C	I_{DSS}	— —	— —	0.25 1	mAdc
Gate-Body Leakage Current, Forward (V_{GSF} = 20 V)	I_{GSSF}	—	—	100	nAdc
Gate-Body Leakage Current, Reverse (V_{GSR} = 20 V)	I_{GSSR}	—	—	100	nAdc
ON CHARACTERISTICS					
Gate Threshold Voltage (I_D = 10 mA, V_{DS} = V_{GS})	$V_{GS(th)}$	2.1	—	4	Vdc

*See MTM5N90 Designer's Data Sheet for a complete set of design curves for this device.
**Use curves of the MTM6N85 are applicable for this device.

(continued)

OUTLINE DIMENSIONS



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	—	39.37	—	1.550
B	—	21.08	—	0.830
C	6.35	8.25	0.250	0.325
D	0.97	1.09	0.038	0.043
E	1.40	1.77	0.055	0.070
F	30.15 BSC		1.187 BSC	
G	10.92 BSC		0.430 BSC	
H	5.46 BSC		0.215 BSC	
J	16.89 BSC		0.665 BSC	
K	11.18	12.19	0.440	0.480
Q	3.84	4.19	0.151	0.165
R	—	26.67	—	1.050
U	4.83	5.33	0.190	0.210
V	3.84	4.19	0.151	0.165

TO-204AA

Quality Semi-Conductors

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

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS — continued						
Static Drain Source On-Resistance[1] (V_{GS} = 10 Vdc, I_D = 3 Adc)	BUZ84 BUZ84A	$r_{DS(on)}$	— —	— —	2 1.5	Ohms
Forward Transconductance[1] (V_{DS} = 25 Vdc, I_D = 3 A)		g_{FS}	1.8	—	—	mhos
CAPACITANCE						
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0, f = 1 MHz)	C_{iss}	—	2000	5000	pF
Output Capacitance		C_{oss}	—	200	350	
Reverse Transfer Capacitance		C_{rss}	—	80	140	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	(V_{DS} = 30 V, I_D = 2.5 Adc BUZ84, I_D = 2.6 Adc BUZ84A, Z_o = 50 Ω, V_{GS} = 10 V) See Figs. 1 and 2	$t_{d(on)}$	—	50	90	ns
Rise Time		t_r	—	100	140	
Turn-Off Delay Time		$t_{d(off)}$	—	320	430	
Fall Time		t_f	—	100	140	
SOURCE-DRAIN DIODE CHARACTERISTICS						
Diode Forward Voltage (V_{GS} = 0) (I_S = 10.6 A BUZ84) (I_S = 12 A BUZ84A)		V_{SD}	— —	— —	1.45 1.5	Vdc
Continuous Source Current, Body Diode	BUZ84 BUZ84A	I_S	— —	— —	5.3 6	Adc
Pulsed Source Current, Body Diode	BUZ84 BUZ84A	I_{SM}	— —	— —	21 24	A
Forward Turn-On Time	(I_S = 5.3 A, V_{GS} = 0)	t_{on}	Limited by stray inductance			
Reverse Recovery Time		t_{rr}	—	1200	—	ns
INTERNAL PACKAGE INDUCTANCE						
Internal Drain Inductance (Measured from the contact screw on the header closer to the source pin and the center of the die.)		L_d	—	5	—	nH
Internal Source Inductance (Measured from the source pin 0.25" from the package to the source bond pad.)		L_s	—	12.5	—	

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

RESISTIVE SWITCHING

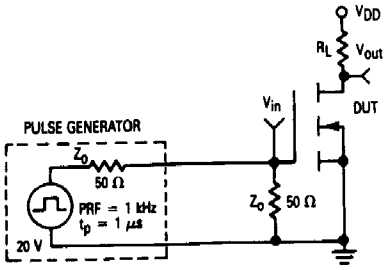

Figure 1. Switching Test Circuit

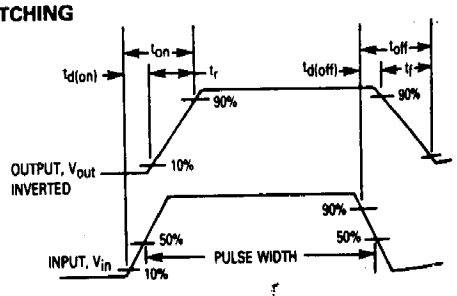

Figure 2. Switching Waveforms