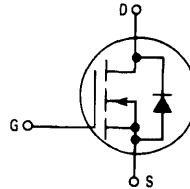


**Power Field Effect Transistor**  
**N-Channel Enhancement-Mode**  
**Silicon Gate TMOS**



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 —  $V_{GS(th)} = 4\text{ V max}$



**MAXIMUM RATINGS**

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

**THERMAL CHARACTERISTICS**

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

**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Drain-Source Breakdown Voltage ( $V_{GS} = 0, I_D = 1\text{ mA}$ )	$V_{BR(DSS)}$	800	—	—	Vdc
Zero Gate Voltage Drain Current ( $V_{DSS} = 800\text{ V}, V_{GS} = 0$ ) $T_J = 125^\circ\text{C}$	$I_{DSS}$	—	—	0.25	mAdc
Gate-Body Leakage Current, Forward ( $V_{GSF} = 20\text{ V}$ )	$I_{GSSF}$	—	—	100	nAdc
Gate-Body Leakage Current, Reverse ( $V_{GSR} = 20\text{ V}$ )	$I_{GSSR}$	—	—	100	nAdc

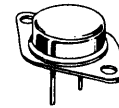
**ON CHARACTERISTICS**

Gate Threshold Voltage ( $I_D = 10\text{ mA}, V_{DS} = V_{GS}$ )	$V_{GS(th)}$	2.1	—	4	Vdc
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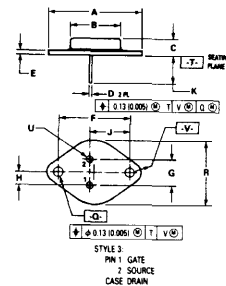
See the MTM5N90 Designer's Data Sheet for a complete set of design curves for this device. (continued)  
 Design curves of the MTM6N85 are applicable for this device.

**BUZ84**  
**BUZ84A**

**TMOS POWER MOSFETS**  
**5.3 and 6 AMPERES**  
 $V_{DS(on)} \approx 1.5$  and  $2\text{ OHMS}$   
**800 VOLTS**



**OUTLINE DIMENSIONS**



- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1987.  
 2. CONTROLLING DIMENSION: INCH.  
 3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO 204AA OUTLINE SHALL APPLY.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	—	28.27	—	1.109
B	—	21.08	—	0.830
C	6.35	8.25	0.250	0.325
D	0.51	1.09	0.020	0.043
E	1.40	1.73	0.055	0.070
F	30.15	BSC	1.187	BSC
G	10.50	BSC	0.413	BSC
H	5.40	BSC	0.213	BSC
J	16.80	BSC	0.661	BSC
K	11.18	12.19	0.440	0.480
L	3.84	4.19	0.151	0.165
M	—	28.27	—	1.109
N	1.63	2.30	0.064	0.091
V	3.84	4.19	0.151	0.165

**CASE 1-06**  
**TO-204AA**

# BUZ84, BUZ84A

## ELECTRICAL CHARACTERISTICS — continued ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>ON CHARACTERISTICS — continued</b>						
Static Drain Source On-Resistance <sup>(1)</sup> ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 3\text{ Adc}$ )	BUZ84 BUZ84A	$r_{DS(on)}$	—	—	2 1.5	Ohms
Forward Transconductance <sup>(1)</sup> ( $V_{DS} = 25\text{ Vdc}$ , $I_D = 3\text{ A}$ )		$g_{FS}$	1.8	—	—	mhos

## CAPACITANCE

Input Capacitance	$(V_{DS} = 25\text{ V},$ $V_{GS} = 0$ $f = 1\text{ MHz})$	$C_{iss}$	—	2000	5000	pF
Output Capacitance		$C_{oss}$	—	200	350	
Reverse Transfer Capacitance		$C_{rss}$	—	80	140	

## SWITCHING CHARACTERISTICS

Turn-On Delay Time	$(V_{DS} = 30\text{ V},$ $I_D = 2.5\text{ Adc BUZ84}$ $I_D = 2.6\text{ Adc BUZ84A}$ $Z_o = 50\ \Omega, V_{GS} = 10\text{ V}$ 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 ( $V_{GS} = 0$ ) ( $I_S = 10.6\text{ A BUZ84}$ ) ( $I_S = 12\text{ A BUZ84A}$ )		$V_{SD}$	—	—	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	$(I_S = 5.3\text{ A},$ $V_{GS} = 0)$	$t_{on}$	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	—	nH

(1) Pulse Test = Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$

## RESISTIVE SWITCHING

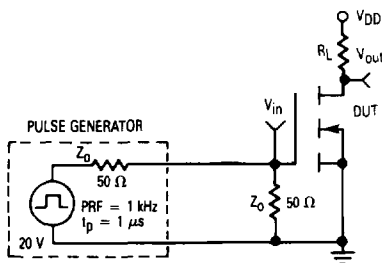


Figure 1. Switching Test Circuit

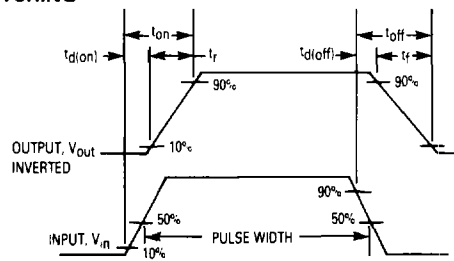


Figure 2. Switching Waveforms