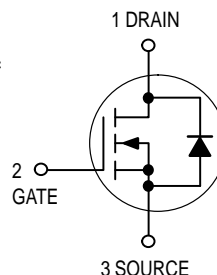


## Logic Level TMOS N-Channel Enhancement Mode

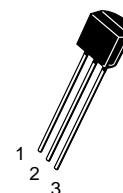
This TMOS FET is designed for high voltage, high speed switching applications such as line drivers, relay drivers, CMOS logic, microprocessor or TTL to high voltage interface and high voltage display drivers.

- Low Drive Requirement,  $V_{GS} = 3.0\text{ V max}$
- Inherent Current Sharing Capability Permits Easy Paralleling of many Devices



**BS108**

**200 VOLTS  
N-CHANNEL TMOS  
POWER FET  
LOGIC LEVEL**



**CASE 29-04, STYLE 30  
TO-92**

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	200	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Drain Current Continuous(1) Pulsed(2)	$I_D$ $I_{DM}$	250 500	mAdc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $T_A = 25^\circ\text{C}$	$P_D$	350 6.4	mW mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

TMOS is a registered trademark of Motorola, Inc.

# BS108

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Drain–Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 10 μA)	V <sub>(BR)DSS</sub>	200	—	—	Vdc
Zero Gate Voltage Drain Current (V <sub>DSS</sub> = 130 Vdc, V <sub>GS</sub> = 0)	I <sub>DSS</sub>	—	—	30	nAdc
Gate–Body Leakage Current (V <sub>GS</sub> = 15 Vdc, V <sub>DS</sub> = 0)	I <sub>GSSF</sub>	—	—	10	nAdc
<b>ON CHARACTERISTICS (2)</b>					
Gate Threshold Voltage (I <sub>D</sub> = 1.0 mA, V <sub>DS</sub> = V <sub>GS</sub> )	V <sub>GS(th)</sub>	0.5	—	1.5	Vdc
Static Drain–to–Source On–Resistance (V <sub>GS</sub> = 2.0 Vdc, I <sub>D</sub> = 50 mA) (V <sub>GS</sub> = 2.8 Vdc, I <sub>D</sub> = 100 mA)	r <sub>DS(on)</sub>	— —	— —	10 8.0	Ohms
Drain Cutoff Current (V <sub>GS</sub> = 0.2 V, V <sub>DS</sub> = 70 V)	I <sub>DSX</sub>	—	—	25	μA
<b>DYNAMIC CHARACTERISTICS</b>					
Input Capacitance (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0, f = 1.0 MHz)	C <sub>iss</sub>	—	—	150	pF
Output Capacitance (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0, f = 1.0 MHz)	C <sub>oss</sub>	—	—	30	pF
Reverse Transfer Capacitance (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0, f = 1.0 MHz)	C <sub>rss</sub>	—	—	10	pF
<b>SWITCHING CHARACTERISTICS</b>					
Turn–On Time (See Figure 1)	t <sub>d(on)</sub>	—	—	15	ns
Turn–Off Time (See Figure 1)	t <sub>d(off)</sub>	—	—	15	ns

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2.0%.

### RESISTIVE SWITCHING

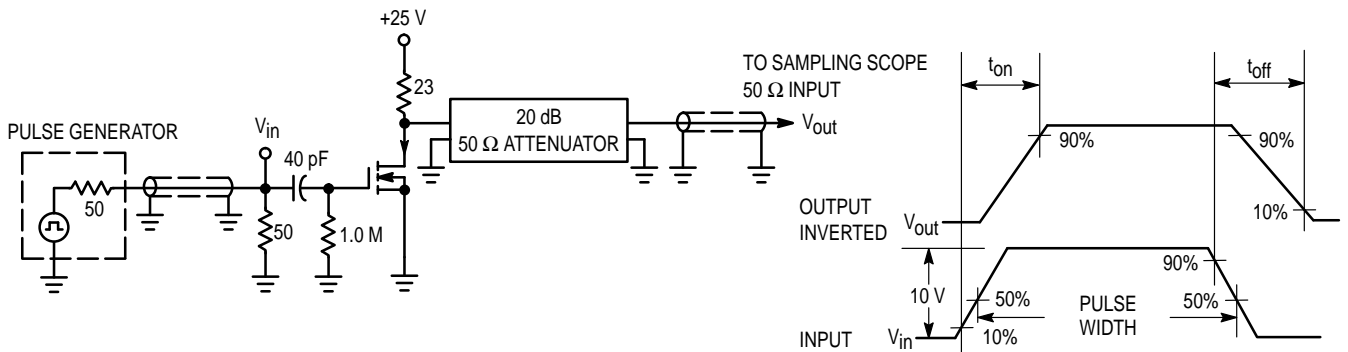


Figure 1. Switching Test Circuit

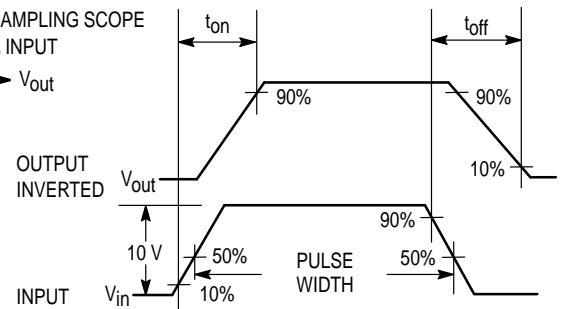
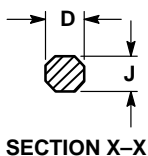
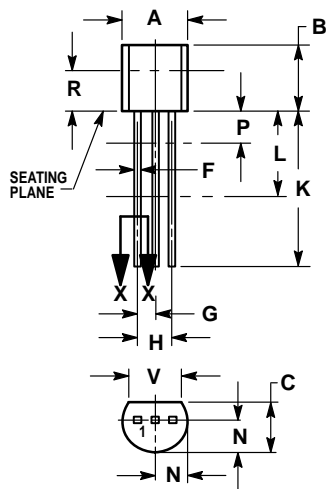


Figure 2. Switching Waveforms

PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
  4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

STYLE 30:  
 PIN 1. DRAIN  
 2. GATE  
 3. SOURCE

**CASE 029-04  
 (TO-226AA)  
 ISSUE AD**

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,  
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
**INTERNET:** <http://Design-NET.com>

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

