

# BS108

Preferred Device

## Small Signal MOSFET 250 mAmps, 200 Volts, Logic Level

### N-Channel TO-92

This MOSFET 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.

#### Features

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

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	200	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Drain Current Continuous (Note 1) Pulsed (Note 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	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

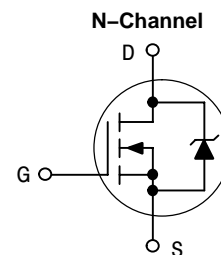
1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .



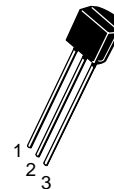
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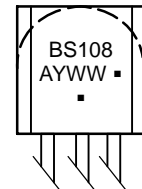
**250 mAmps**  
**200 Volts**  
 $R_{DS(on)} = 8 \Omega$



#### MARKING DIAGRAM



TO-92  
CASE 29-11  
STYLE 30



BS108 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
BS108	TO-92	1000 Units/Box
BS108G	TO-92 (Pb-Free)	1000 Units/Box
BS108ZL1	TO-92	2000/Ammo Pack
BS108ZL1G	TO-92 (Pb-Free)	2000/Ammo Pack

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Preferred devices are recommended choices for future use and best overall value.

# BS108

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Drain-Source Breakdown Voltage ( $V_{GS} = 0$ , $I_D = 10 \mu\text{A}$ )	$V_{(BR)DS}$	200	-	-	Vdc
Zero Gate Voltage Drain Current ( $V_{DSS} = 130 \text{ Vdc}$ , $V_{GS} = 0$ )	$I_{DSS}$	-	-	30	nAdc
Gate-Body Leakage Current ( $V_{GS} = 15 \text{ Vdc}$ , $V_{DS} = 0$ )	$I_{GSSF}$	-	-	10	nAdc
<b>ON CHARACTERISTICS (Note 3)</b>					
Gate Threshold Voltage ( $I_D = 1.0 \text{ mA}$ , $V_{DS} = V_{GS}$ )	$V_{GS(th)}$	0.5	-	1.5	Vdc
Static Drain-to-Source On-Resistance ( $V_{GS} = 2.0 \text{ Vdc}$ , $I_D = 50 \text{ mA}$ ) ( $V_{GS} = 2.8 \text{ Vdc}$ , $I_D = 100 \text{ mA}$ )	$r_{DS(on)}$	-	-	10 8.0	$\Omega$
Drain Cutoff Current ( $V_{GS} = 0.2 \text{ V}$ , $V_{DS} = 70 \text{ V}$ )	$I_{DSX}$	-	-	25	$\mu\text{A}$
Forward Transconductance ( $I_D = 120 \text{ mA}$ , $V_{DS} = 20 \text{ V}$ )	$g_{FS}$	-	0.33	-	Mhos
<b>DYNAMIC CHARACTERISTICS</b>					
Input Capacitance ( $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{iss}$	-	-	150	pF
Output Capacitance ( $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{oss}$	-	-	30	pF
Reverse Transfer Capacitance ( $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{rss}$	-	-	10	pF
<b>SWITCHING CHARACTERISTICS</b>					
Turn-On Time (See Figure 1)	$t_{d(on)}$	-	-	15	ns
Turn-Off Time (See Figure 1)	$t_{d(off)}$	-	-	15	ns

3. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle = 2.0%.

## RESISTIVE SWITCHING

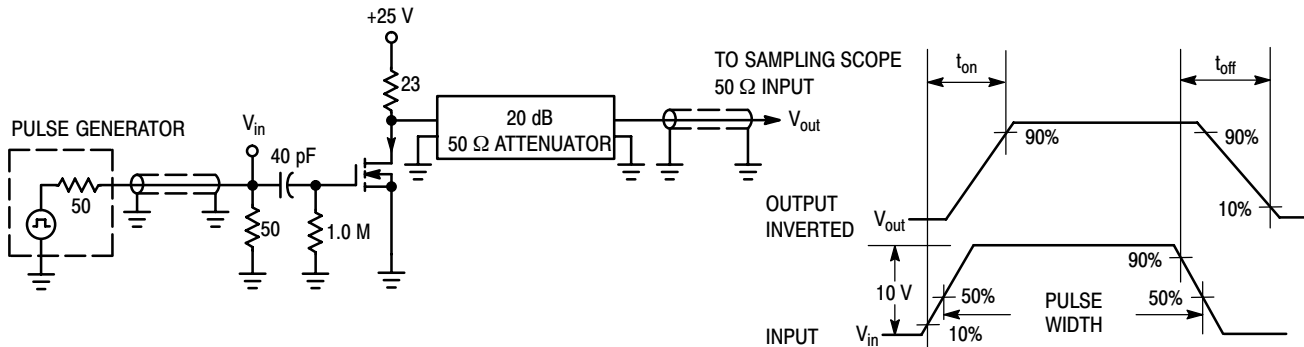


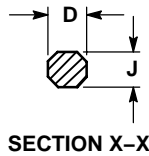
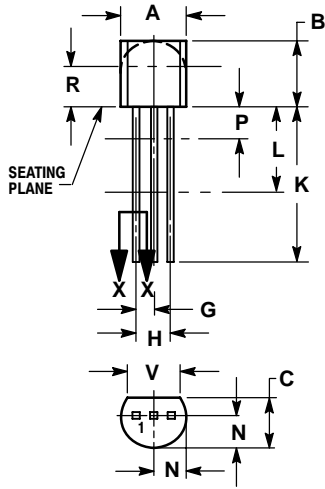
Figure 1. Switching Test Circuit

Figure 2. Switching Waveforms

# BS108

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-11  
ISSUE AL



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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	0.021	0.407	0.533
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:

1. DRAIN
2. GATE
3. SOURCE

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