

# BS108

## 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
- AEC Qualified
- PPAP Capable
- This is a Pb-Free Device\*

#### 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	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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  $\leq 2.0\%$ .



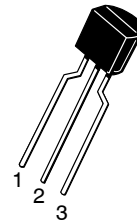
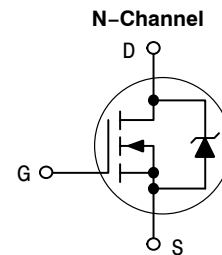
ON Semiconductor®

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**250 mAmps**

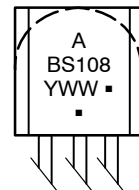
**200 VOLTS**

**$R_{DS(on)} = 8\ \Omega$**



TO-92  
CASE 29-11  
STYLE 30

#### MARKING DIAGRAM



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
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.

# BS108

## ELECTRICAL CHARACTERISTICS (T<sub>C</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)DS</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 (Note 3)</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	Ω
Drain Cutoff Current (V <sub>GS</sub> = 0.2 V, V <sub>DS</sub> = 70 V)	I <sub>DSX</sub>	-	-	25	μA
Forward Transconductance (I <sub>D</sub> = 120 mA, V <sub>DS</sub> = 20 V)	g <sub>FS</sub>	-	0.33	-	Mhos
<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

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

## RESISTIVE SWITCHING

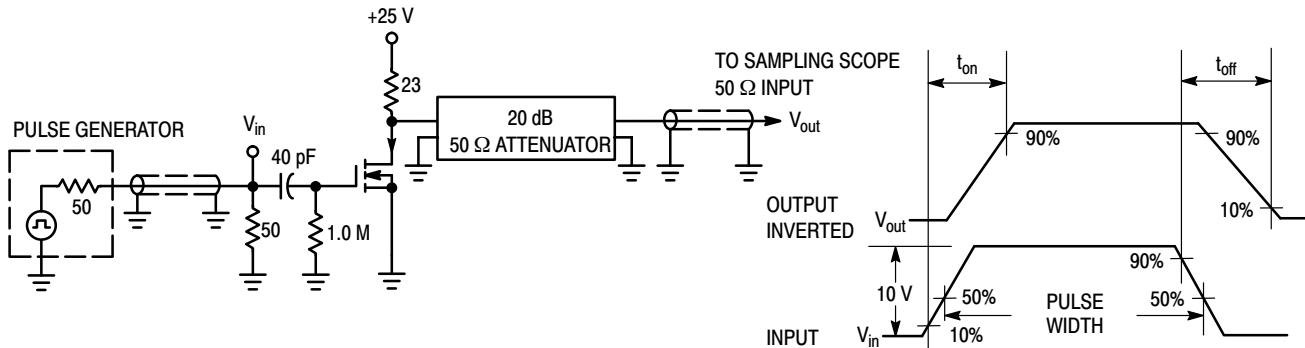


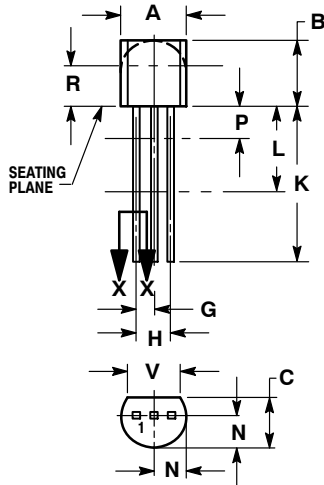
Figure 1. Switching Test Circuit

Figure 2. Switching Waveforms

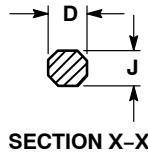
# BS108

## PACKAGE DIMENSIONS

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



STRAIGHT LEAD  
BULK PACK

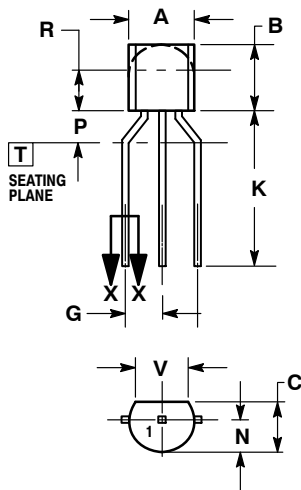


SECTION X-X

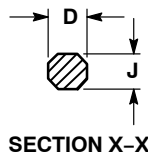
NOTES:

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	---



BENT LEAD  
TAPE & REEL  
AMMO PACK



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 30:

1. DRAIN
2. GATE
3. SOURCE

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