

# BS107, BS107A

Preferred Device

## Small Signal MOSFET 250 mAmps, 200 Volts N-Channel TO-92



ON Semiconductor

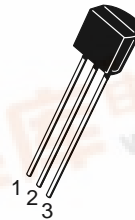
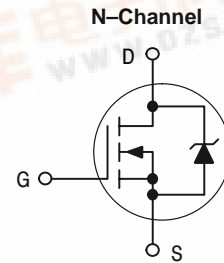
<http://onsemi.com>

**250 mAmps**  
**200 Volts**  
**R<sub>DS(on)</sub> = 14 Ω (BS107)**  
**R<sub>DS(on)</sub> = 6.4 Ω (BS107A)**

### MAXIMUM RATINGS

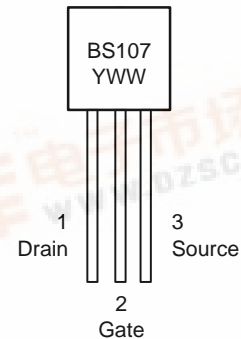
Rating	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	200	Vdc
Gate-Source Voltage - Continuous - Non-repetitive (t <sub>p</sub> ≤ 50 μs)	V <sub>GS</sub> V <sub>GSM</sub>	±20 ±30	Vdc Vpk
Drain Current Continuous (Note 1.) Pulsed (Note 2.)	I <sub>D</sub> I <sub>DM</sub>	250 500	mA <sub>dc</sub>
Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	350	mW
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C

- The Power Dissipation of the package may result in a lower continuous drain current.
- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.



TO-92  
CASE 29  
Style 30

### MARKING DIAGRAM & PIN ASSIGNMENT



Y = Year  
WW = Work Week

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

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



# BS107, BS107A

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Zero-Gate-Voltage Drain Current ( $V_{DS} = 130\text{ Vdc}$ , $V_{GS} = 0$ )	$I_{DSS}$	-	-	30	nAdc
Drain-Source Breakdown Voltage ( $V_{GS} = 0$ , $I_D = 100\ \mu\text{Adc}$ )	$V_{(BR)DSX}$	200	-	-	Vdc
Gate Reverse Current ( $V_{GS} = 15\text{ Vdc}$ , $V_{DS} = 0$ )	$I_{GSS}$	-	0.01	10	nAdc

## ON CHARACTERISTICS (Note 2.)

Gate Threshold Voltage ( $I_D = 1.0\text{ mAdc}$ , $V_{DS} = V_{GS}$ )	$V_{GS(Th)}$	1.0	-	3.0	Vdc
Static Drain-Source On Resistance	$r_{DS(on)}$				Ohms
BS107 ( $V_{GS} = 2.6\text{ Vdc}$ , $I_D = 20\text{ mAdc}$ )		-	-	28	
( $V_{GS} = 10\text{ Vdc}$ , $I_D = 200\text{ mAdc}$ )		-	-	14	
BS107A ( $V_{GS} = 10\text{ Vdc}$ )		-	4.5	6.0	
( $I_D = 100\text{ mAdc}$ )		-	4.8	6.4	
( $I_D = 250\text{ mAdc}$ )		-	-	-	

## SMALL-SIGNAL CHARACTERISTICS

Input Capacitance ( $V_{DS} = 25\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0\text{ MHz}$ )	$C_{iss}$	-	60	-	pF
Reverse Transfer Capacitance ( $V_{DS} = 25\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0\text{ MHz}$ )	$C_{rss}$	-	6.0	-	pF
Output Capacitance ( $V_{DS} = 25\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0\text{ MHz}$ )	$C_{oss}$	-	30	-	pF
Forward Transconductance ( $V_{DS} = 25\text{ Vdc}$ , $I_D = 250\text{ mAdc}$ )	$g_{fs}$	200	400	-	mmhos

## SWITCHING CHARACTERISTICS

Turn-On Time	$t_{on}$	-	6.0	15	ns
Turn-Off Time	$t_{off}$	-	12	15	ns

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

## RESISTIVE SWITCHING

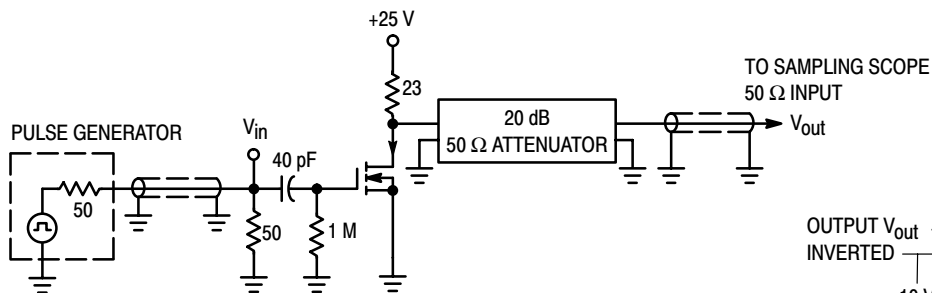


Figure 1. Switching Test Circuit

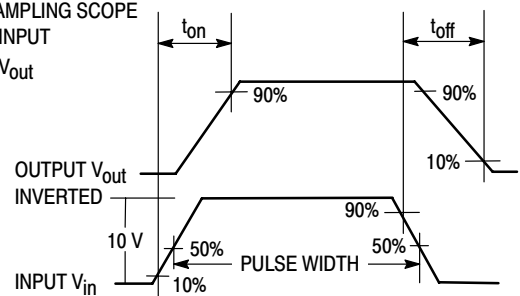


Figure 2. Switching Waveforms

# BS107, BS107A

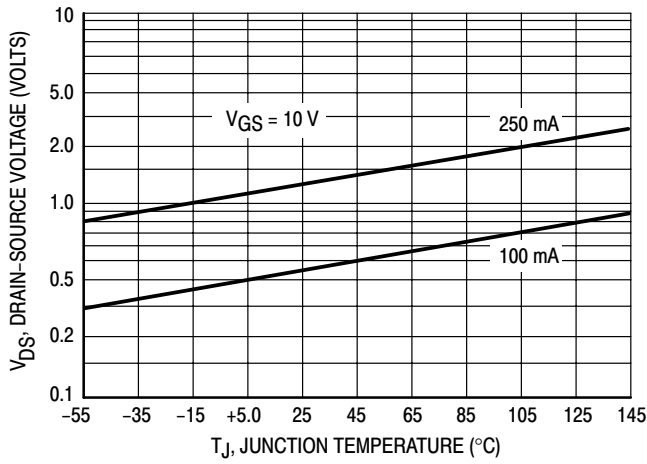


Figure 3. On Voltage versus Temperature

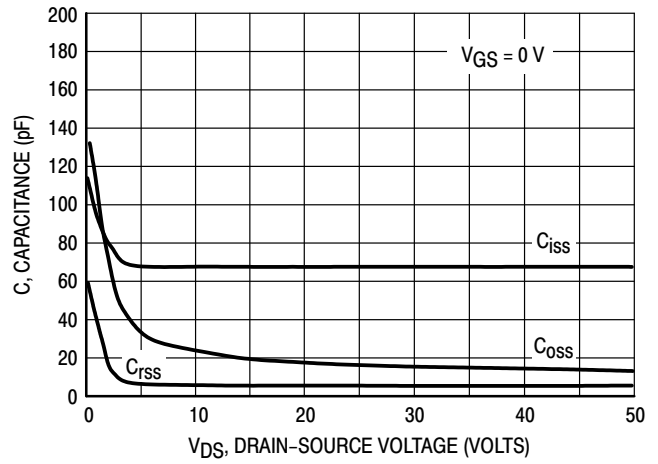


Figure 4. Capacitance Variation

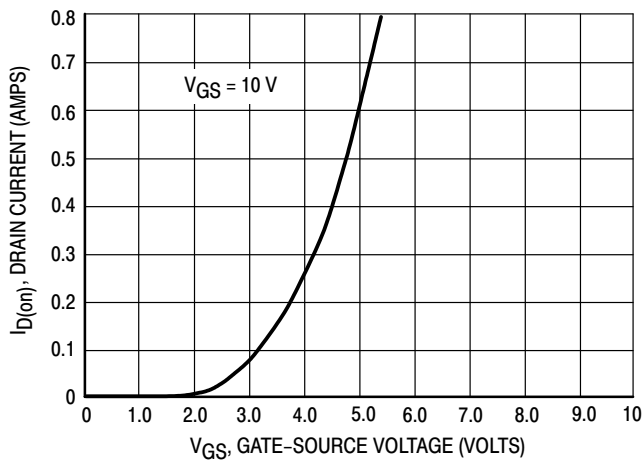


Figure 5. Transfer Characteristic

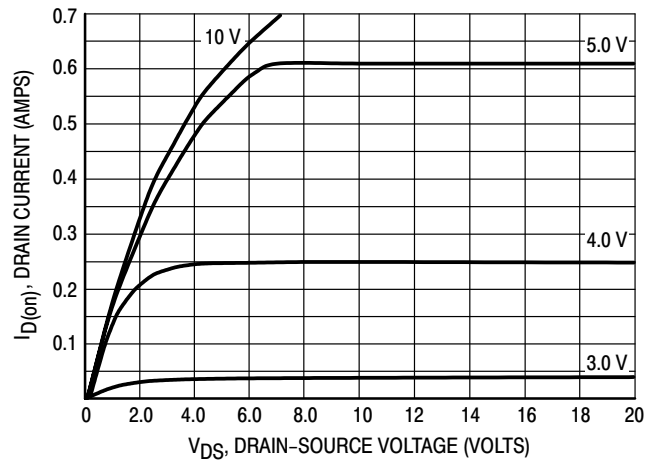


Figure 6. Output Characteristic

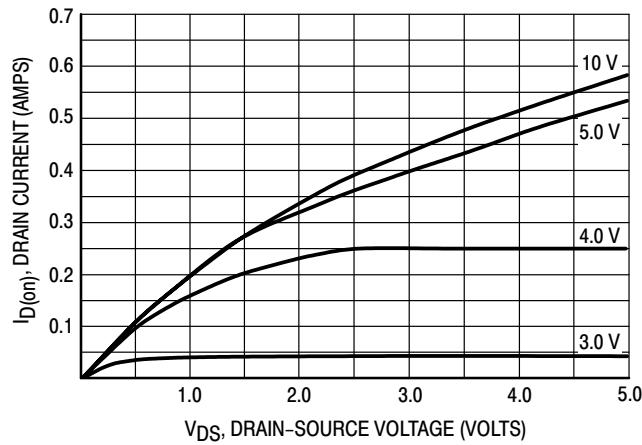


Figure 7. Saturation Characteristic

## BS107, BS107A

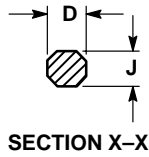
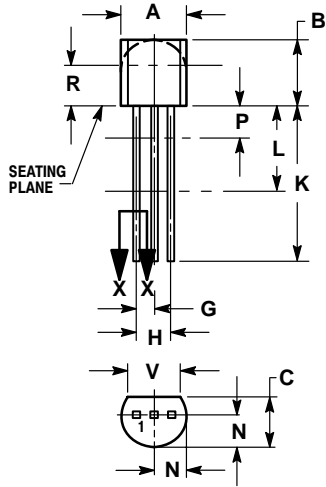
### ORDERING INFORMATION

<b>Device</b>	<b>Package</b>	<b>Shipping</b>
BS107	TO-92	1000 Unit/Box
BS107RLRA	TO-92	2000 Tape & Reel
BS107RL1	TO-92	2000 Tape & Reel
BS107A	TO-92	1000 Units/Box
BS107ARLRM	TO-92	2000 Ammo Pack
BS107ARLRP	TO-92	2000 Ammo Pack
BS107ARL1	TO-92	2000 Tape & Reel

# BS107, BS107A

## PACKAGE DIMENSIONS

TO-92  
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:

- PIN 1. DRAIN
2. GATE
3. SOURCE


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**Notes**

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**Notes**

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