

# BS107, BS107A

Preferred Device

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

### Features

- Pb-Free Package is Available\*

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	200	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
- Continuous	$V_{GSM}$	$\pm 30$	Vpk
- Non-repetitive ( $t_p \leq 50 \mu s$ )			
Drain Current			mAdc
Continuous (Note 1)	$I_D$	250	
Pulsed (Note 2)	$I_{DM}$	500	
Total Device Dissipation @ $T_A = 25^\circ C$ Derate above $25^\circ C$	$P_D$	350	mW
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ C$

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.

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



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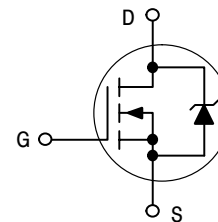
<http://onsemi.com>

**250 mA, 200 V**

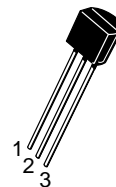
**$R_{DS(on)} = 14 \Omega$  (BS107)**

**$R_{DS(on)} = 6.4 \Omega$  (BS107A)**

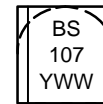
N-Channel



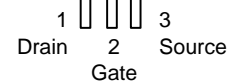
### MARKING DIAGRAM & PIN ASSIGNMENT



**TO-92  
CASE 29  
STYLE 30**



BS107 = Specific Device Code  
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.

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

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 3)

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	$r_{DS(on)}$	-	-	-	$\Omega$
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

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

## RESISTIVE SWITCHING

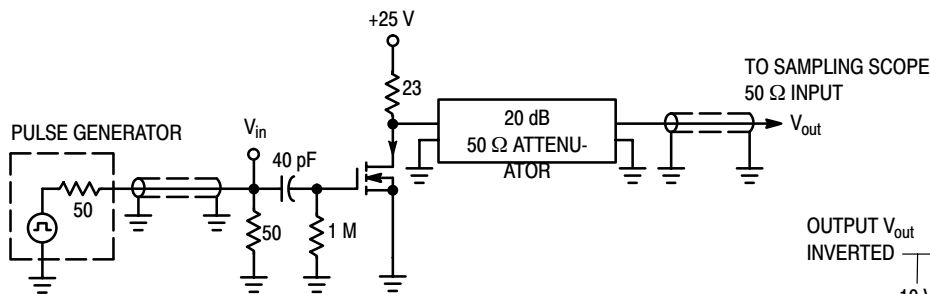


Figure 1. Switching Test Circuit

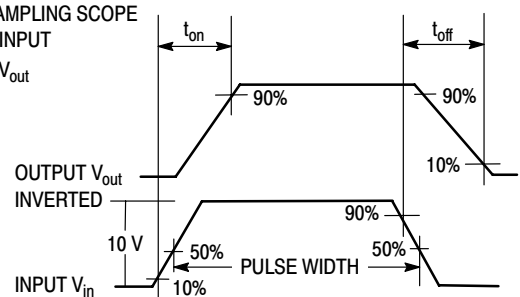


Figure 2. Switching Waveforms

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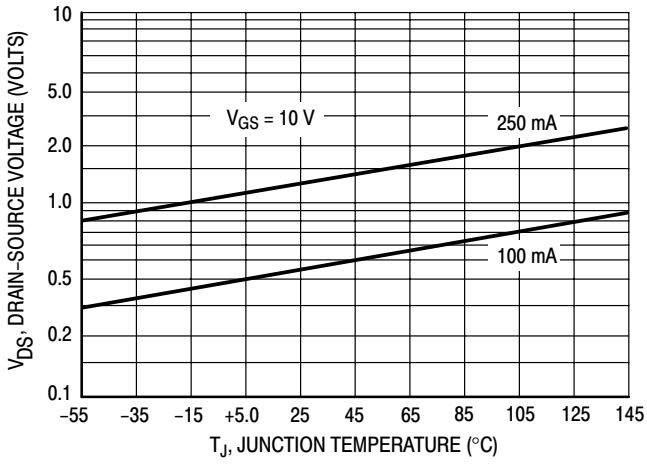


Figure 3. On Voltage versus Temperature

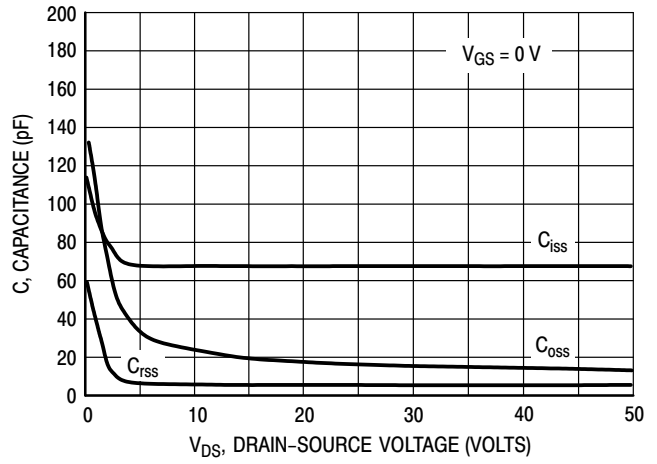


Figure 4. Capacitance Variation

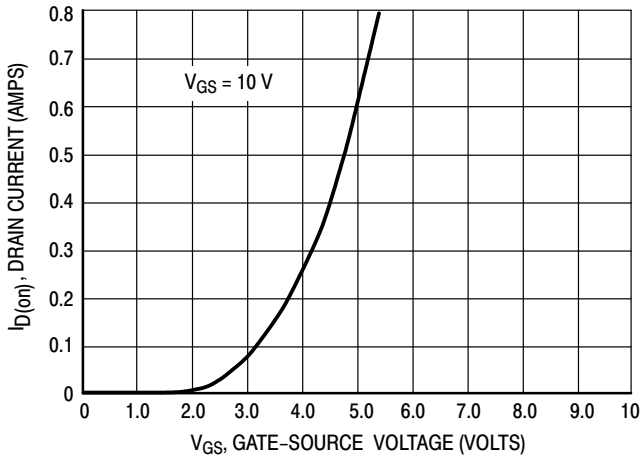


Figure 5. Transfer Characteristic

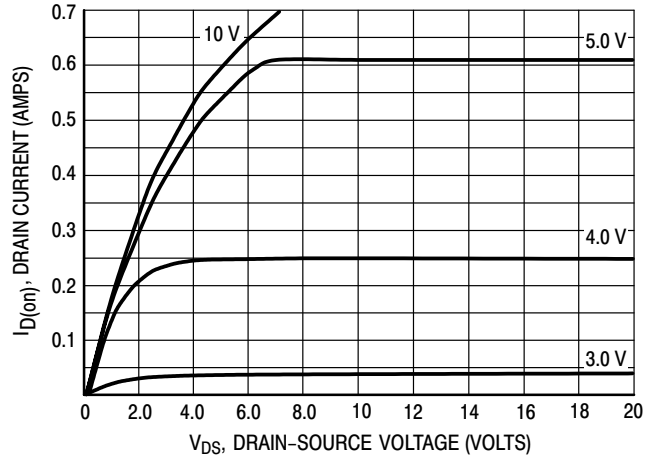


Figure 6. Output Characteristic

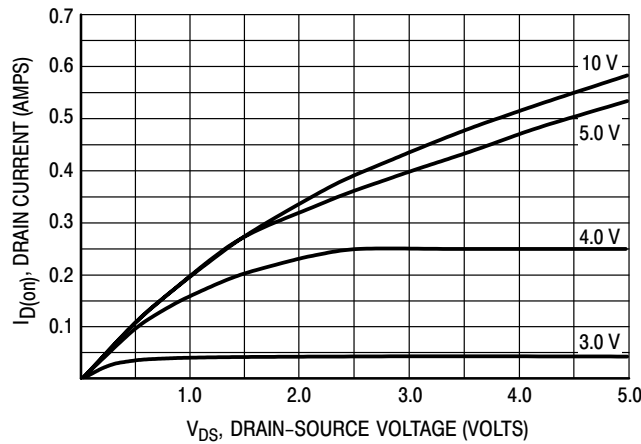


Figure 7. Saturation Characteristic

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### ORDERING INFORMATION

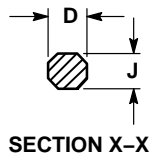
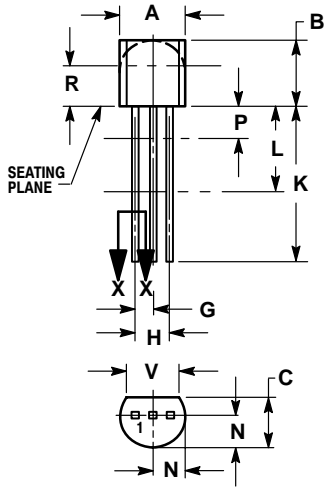
Device	Package	Shipping†
BS107	TO-92	1000 Unit / Box
BS107G	TO-92 (Pb-Free)	
BS107RLRA	TO-92	2000 / Tape & Reel
BS107RL1	TO-92	2000 / Tape & Reel
BS107A	TO-92	1000 Units / Box
BS107AG	TO-92 (Pb-Free)	
BS107ARLRM	TO-92	2000 Ammo Pack
BS107ARLRP	TO-92	2000 Ammo Pack
BS107ARL1	TO-92	2000 / Tape & Reel
BS107ARL1G	TO-92 (Pb-Free)	

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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## 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:

- PIN 1. DRAIN
2. GATE
3. SOURCE

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