



**THE DATASHEET OF
BS107ARL1G**



ON Semiconductor

Is Now

The logo for onsemi, featuring the word "onsemi" in a dark teal, lowercase, sans-serif font. The letter "i" is stylized with a white dot and a teal vertical bar. A small orange triangle is positioned above the top right of the "i". A trademark symbol (TM) is located to the right of the logo.

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BS107A

Small Signal MOSFET

250 mA, 200 V, N-Channel TO-92

Features

- AEC-Q101 Qualified and PPAP Capable
- This is a Pb-Free Device*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	200	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
- Continuous	V_{GSM}	± 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 @ $T_A = 25^\circ C$	P_D	350	mW
Derate above $25^\circ C$			
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ C$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, 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 $\leq 300 \mu s$, Duty Cycle $\leq 2.0\%$.

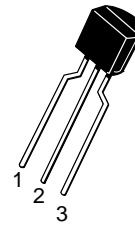
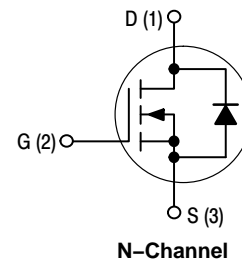


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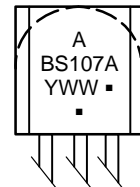
250 mAMPS, 200 VOLTS

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



TO-92
CASE 29-11
STYLE 30

MARKING DIAGRAM



- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping
BS107ARL1G	TO-92 (Pb-Free)	2000 / Tape & Reel

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

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

BS107A

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	$r_{DS(on)}$	-	-	-	Ω
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

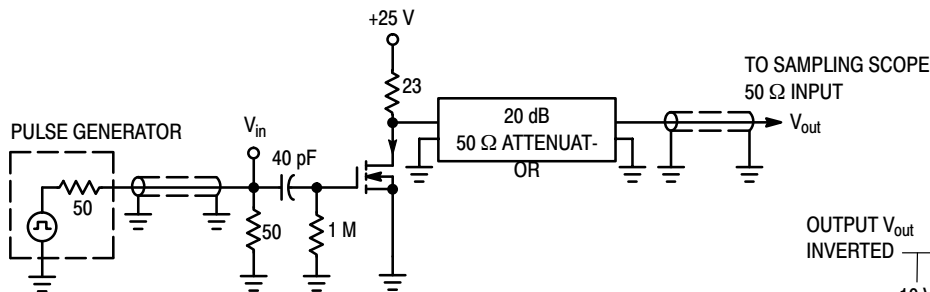


Figure 1. Switching Test Circuit

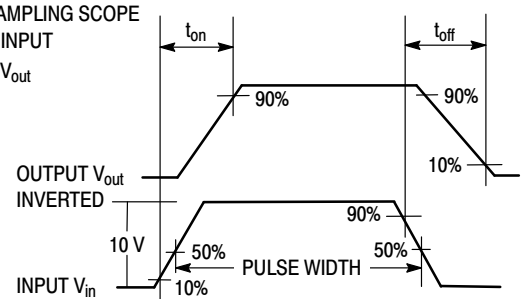


Figure 2. Switching Waveforms

BS107A

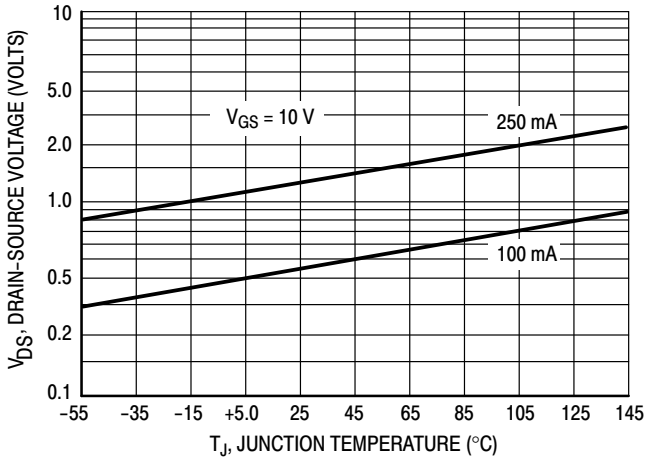


Figure 3. On Voltage versus Temperature

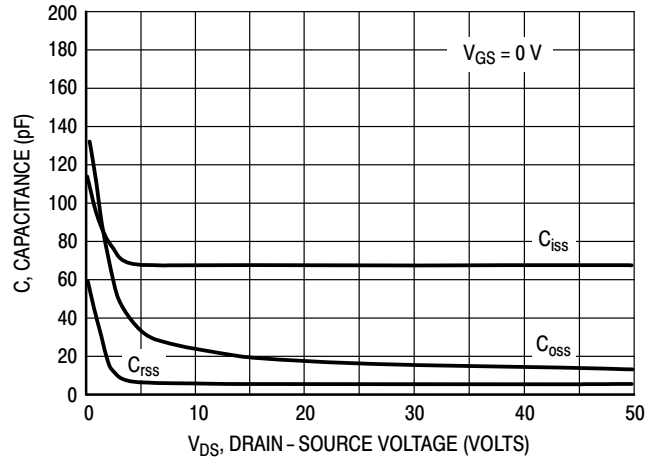


Figure 4. Capacitance Variation

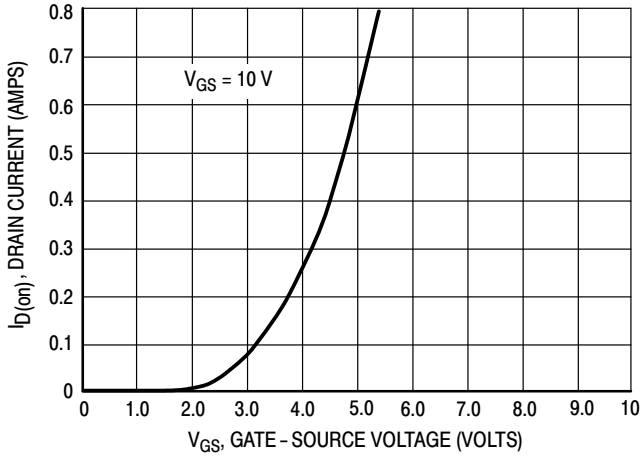


Figure 5. Transfer Characteristic

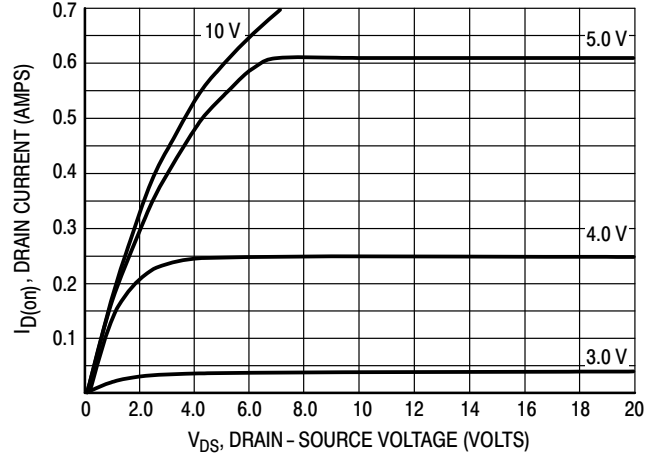


Figure 6. Output Characteristic

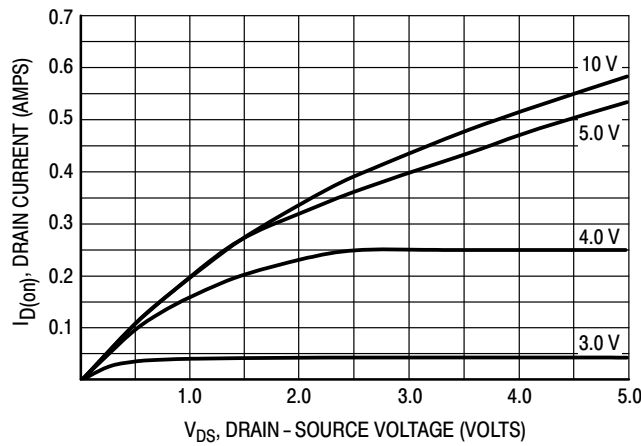
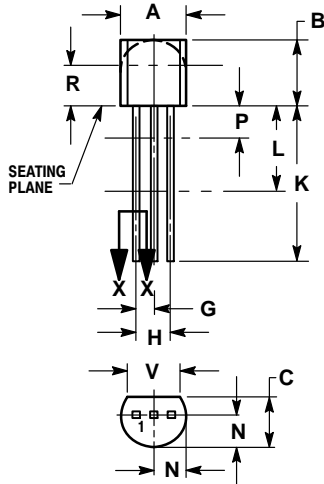


Figure 7. Saturation Characteristic

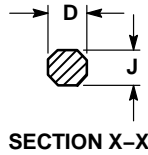
BS107A

PACKAGE DIMENSIONS

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



STRAIGHT LEAD
BULK PACK

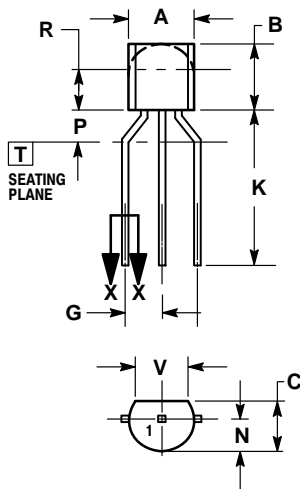


SECTION X-X

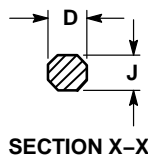
NOTES:

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.
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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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