BS107, BS107A

Preferred Device

Small Signal MOSFET 250 mAmps, 200 Volts

N–Channel TO–92

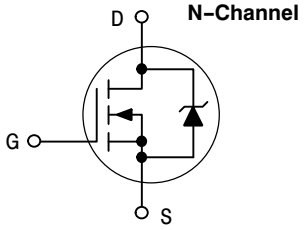
ON Semiconductor®

http://onsemi.com

Features

- AEC Qualified
- PPAP Capable
- Pb–Free Package is Available*

250 mAMPS, 200 VOLTS
$R_{DS(on)}$ = 14 Ω (BS107)
$R_{DS(on)}$ = 6.4 Ω (BS107A)



N–Channel

MAXIMUM RATINGS

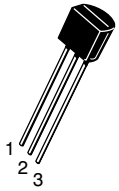
Rating	Symbol	Value	Unit
Drain–Source Voltage	V_{DS}	200	Vdc
Gate–Source Voltage – Continuous – Non–repetitive ($t_p \le 50$ μs)	 V_{GS} V_{GSM}	 ±20 ±30	 Vdc Vpk
Drain Current Continuous (Note 1) Pulsed (Note 2)	 I_D I_{DM}	 250 500	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	350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

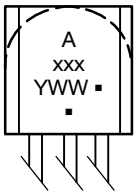
1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

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

MARKING DIAGRAM



TO–92
CASE 29–11
STYLE 30



xxx = BS107 or BS107A
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb–Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping
BS107	TO–92	1000 Units/Box
BS107G	TO–92 (Pb–Free)	1000 Units/Box
BS107A	TO–92	1000 Units/Box
BS107AG	TO–92 (Pb–Free)	1000 Units/Box
BS107ARL1	TO–92	2000/Ammo Pack
BS107ARL1G	TO–92 (Pb–Free)	2000/Ammo Pack

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Zero−Gate−Voltage Drain Current (V_{DS} = 130 Vdc, V_{GS} = 0)	I_{DSS}	−	−	30	nAdc
Drain−Source Breakdown Voltage (V_{GS} = 0, I_D = 100 μAdc)	$V_{(BR)DSX}$	200	−	−	Vdc
Gate Reverse Current (V_{GS} = 15 Vdc, V_{DS} = 0)	I_{GSS}	−	0.01	10	nAdc
ON CHARACTERISTICS (Note 3)					
Gate Threshold Voltage (I_D = 1.0 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 Vdc, I_D = 20 mAdc)		−	−	28	
(V_{GS} = 10 Vdc, I_D = 200 mAdc)		−	−	14	
BS107A (V_{GS} = 10 Vdc)					
(I_D = 100 mAdc)		−	4.5	6.0	
(I_D = 250 mAdc)		−	4.8	6.4	
SMALL−SIGNAL CHARACTERISTICS					
Input Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)	C_{iss}	−	60	−	pF
Reverse Transfer Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)	C_{rss}	−	6.0	−	pF
Output Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)	C_{oss}	−	30	−	pF
Forward Transconductance (V_{DS} = 25 Vdc, I_D = 250 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 ≤ 300 μs, Duty Cycle ≤ 2.0%.

RESISTIVE SWITCHING

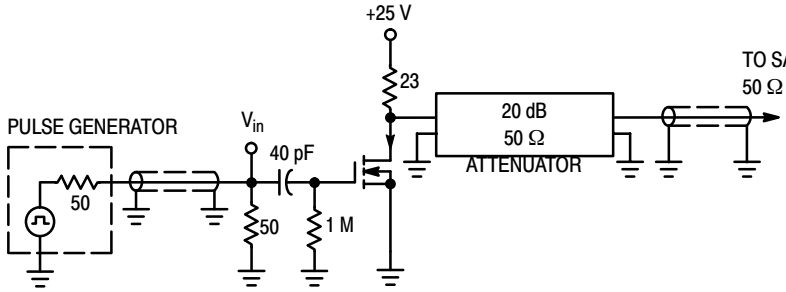


Figure 1. Switching Test Circuit

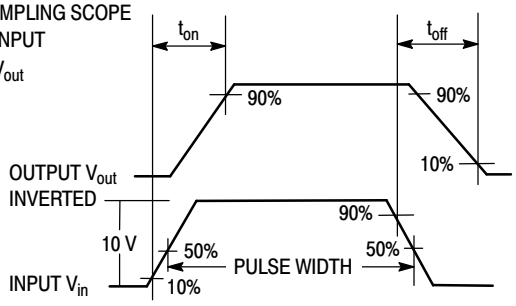


Figure 2. Switching Waveforms

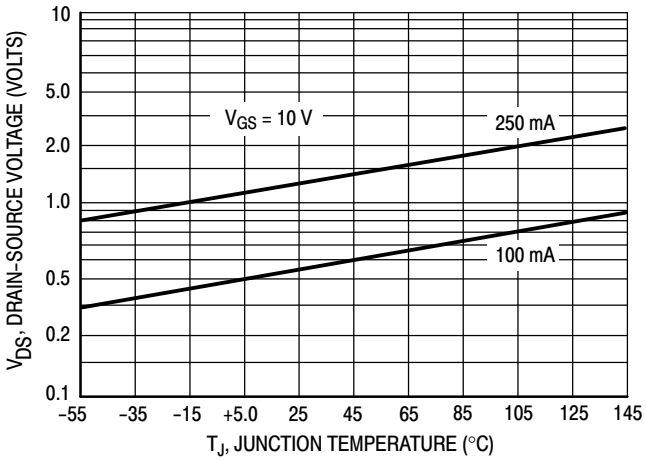


Figure 3. On Voltage versus Temperature

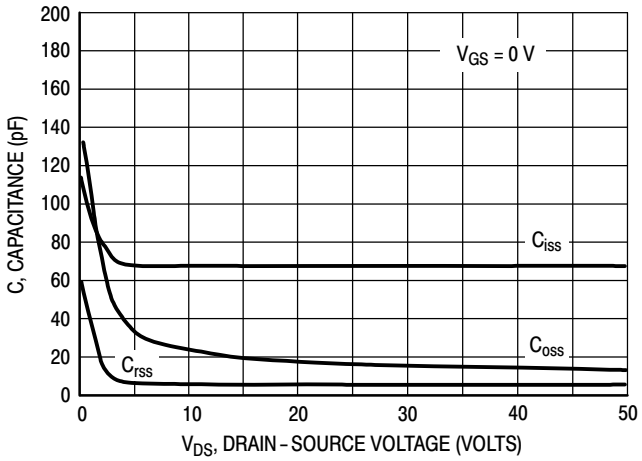


Figure 4. Capacitance Variation

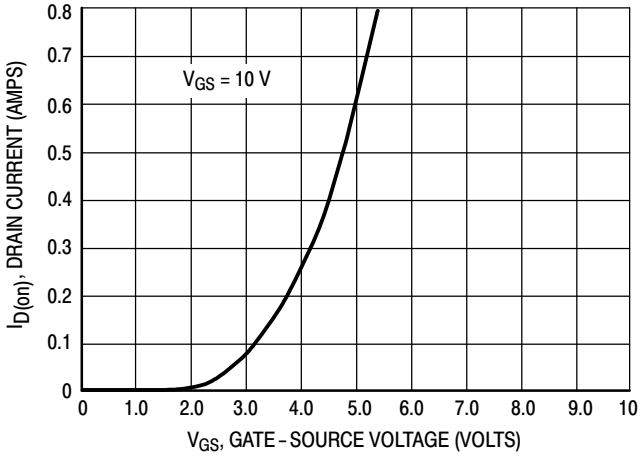


Figure 5. Transfer Characteristic

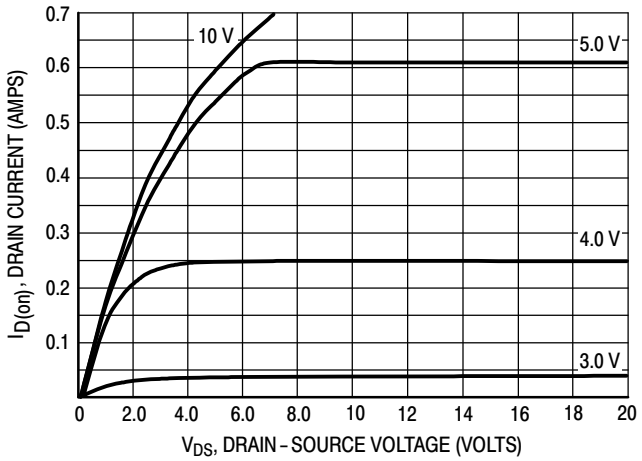


Figure 6. Output Characteristic

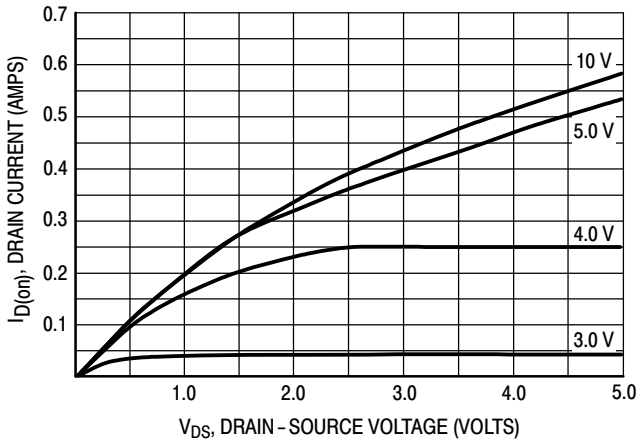
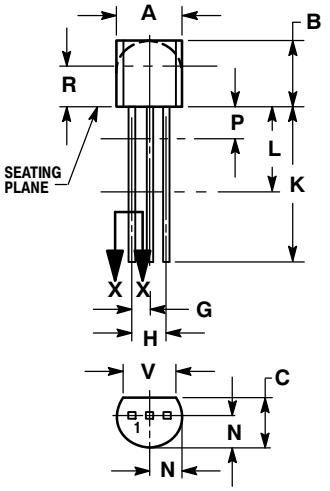


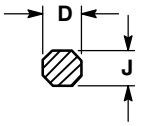
Figure 7. Saturation Characteristic

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.

	INCHES		MILLIMETERS	
DIM	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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
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BS107/D