



THE DATASHEET OF BS107AG



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 $\leq 2.0\%$.

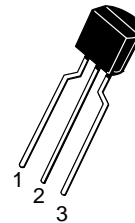
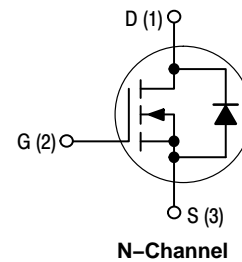


ON Semiconductor®

<http://onsemi.com>

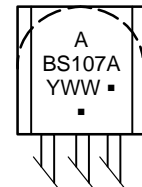
250 mAMPS, 200 VOLTS

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



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 |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

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

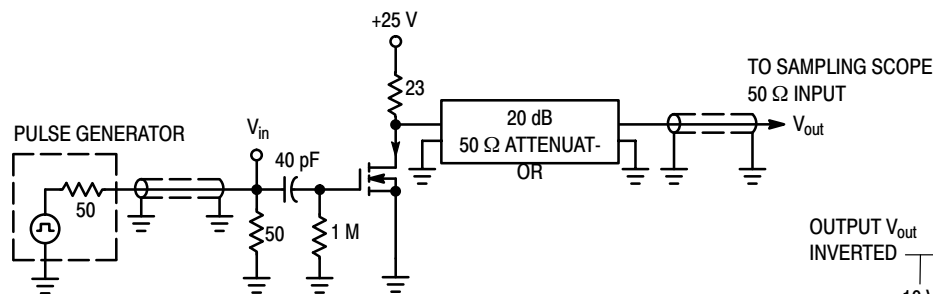


Figure 1. Switching Test Circuit

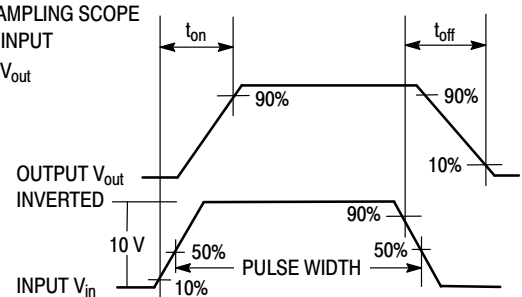


Figure 2. Switching Waveforms

BS107A

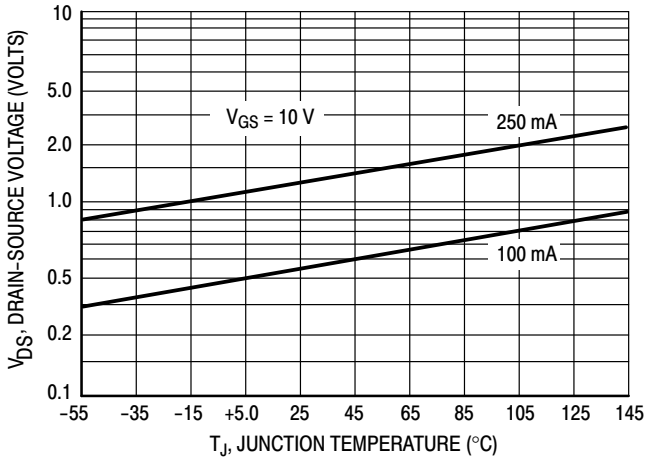


Figure 3. On Voltage versus Temperature

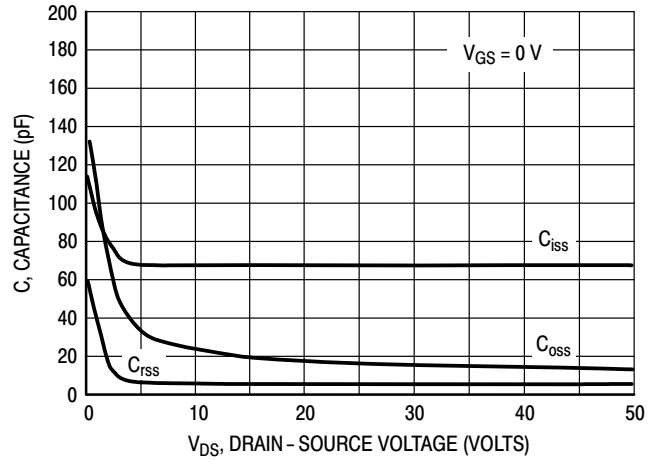


Figure 4. Capacitance Variation

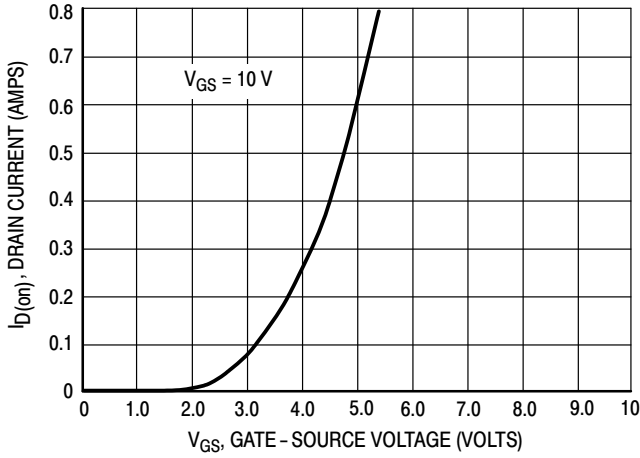


Figure 5. Transfer Characteristic

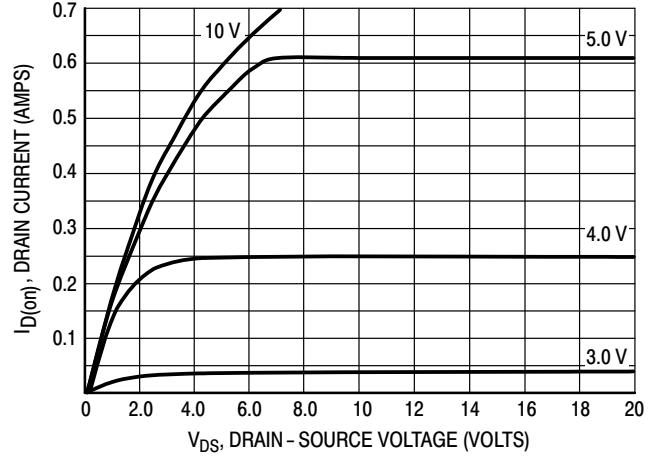


Figure 6. Output Characteristic

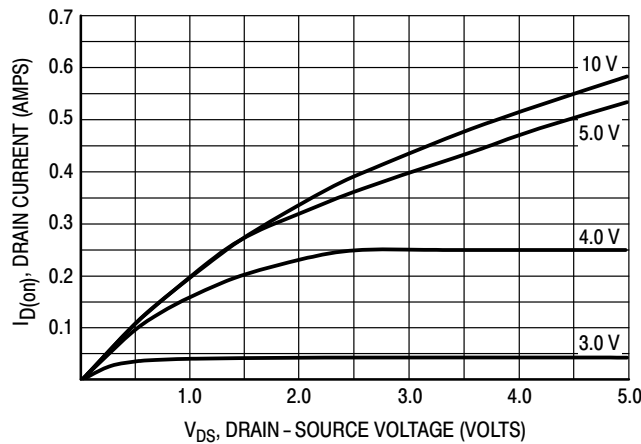
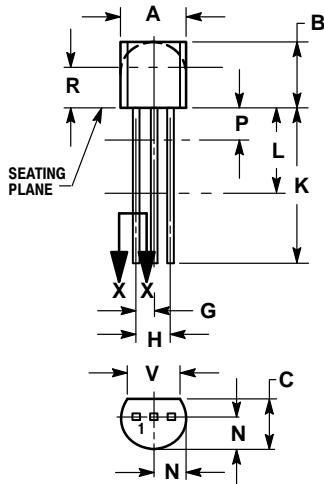


Figure 7. Saturation Characteristic

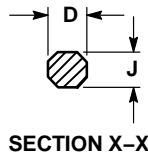
BS107A

PACKAGE DIMENSIONS

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



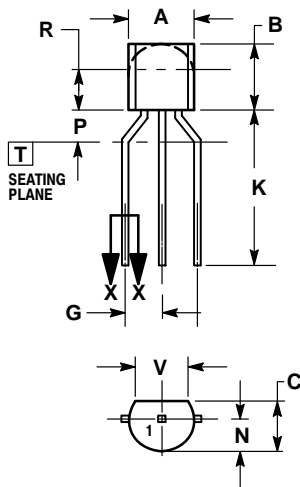
STRAIGHT LEAD
BULK PACK



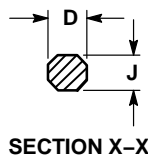
NOTES:

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



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

ON Semiconductor and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marketing.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

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
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com



N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View BS107AG](#) on WIN SOURCE
-  [ON Semiconductor](#) Information

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management