

BS107ARL1 Datasheet

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| | |
|------------------------------|---|
| DiGi Electronics Part Number | BS107ARL1-DG |
| Manufacturer | onsemi |
| Manufacturer Product Number | BS107ARL1 |
| Description | MOSFET N-CH 200V 250MA TO92-3 |
| Detailed Description | N-Channel 200 V 250mA (Ta) 350mW (Ta) Through Hole TO-92 (TO-226) |



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:

BS107ARL1

Series:

-

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

200 V

Drive Voltage (Max Rds On, Min Rds On):

10V

Vgs(th) (Max) @ Id:

3V @ 1mA

Input Capacitance (Ciss) (Max) @ Vds:

60 pF @ 25 V

Power Dissipation (Max):

350mW (Ta)

Mounting Type:

Through Hole

Package / Case:

TO-226-3, TO-92-3 Long Body (Formed Leads)

Manufacturer:

onsemi

Product Status:

Obsolete

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

250mA (Ta)

Rds On (Max) @ Id, Vgs:

6.4Ohm @ 250mA, 10V

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 150°C (TJ)

Supplier Device Package:

TO-92 (TO-226)

Base Product Number:

BS107

Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

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.

To learn more about onsemi™, please visit our website at
www.onsemi.com

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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_{GS} | ± 20 | Vdc |
| - Non-repetitive ($t_p \leq 50 \mu s$) | V_{GSM} | ± 30 | Vpk |
| Drain Current | I_D | 250 | mAdc |
| Continuous (Note 1) | I_{DM} | 500 | mAdc |
| Pulsed (Note 2) | | | |
| 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 $\leq 2.0\%$.

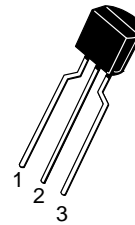
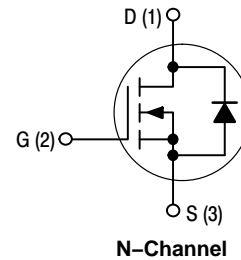


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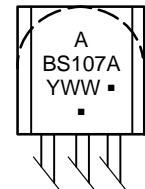
250 mAMPS, 200 VOLTS

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



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

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

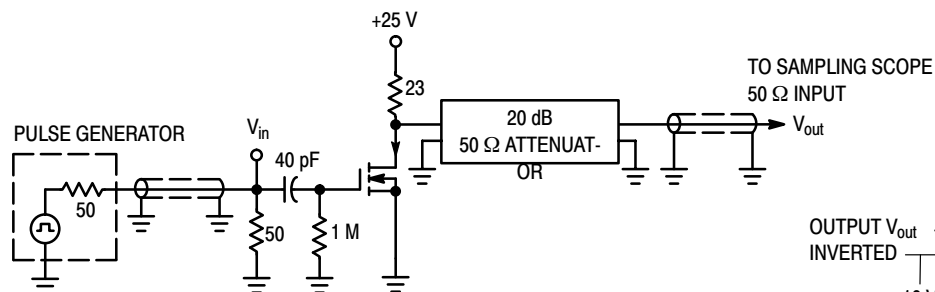


Figure 1. Switching Test Circuit

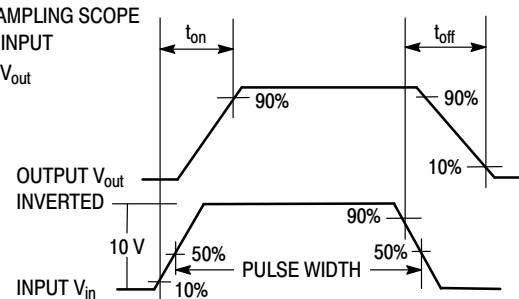


Figure 2. Switching Waveforms

BS107A

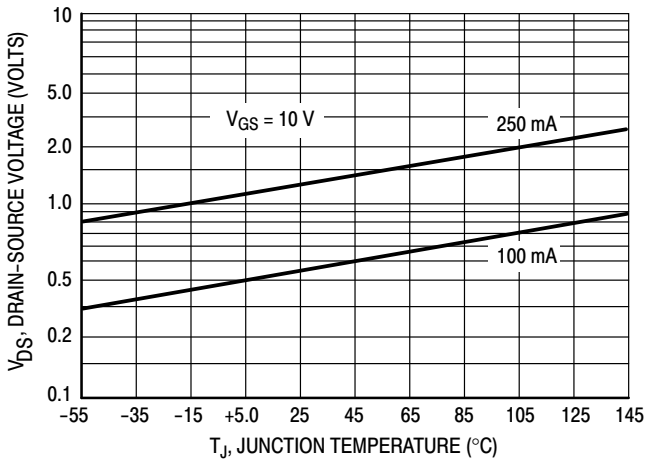


Figure 3. On Voltage versus Temperature

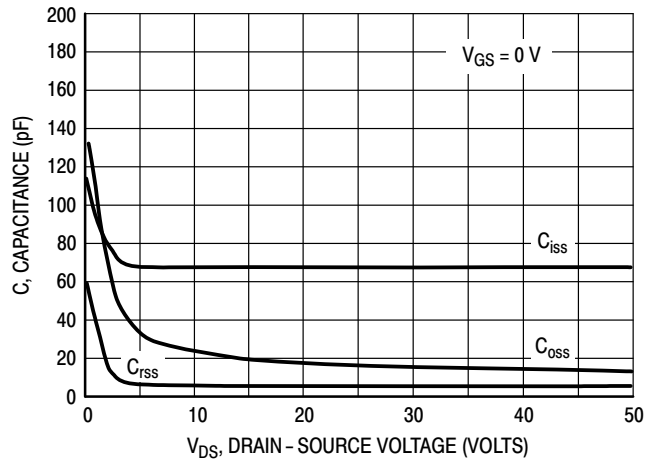


Figure 4. Capacitance Variation

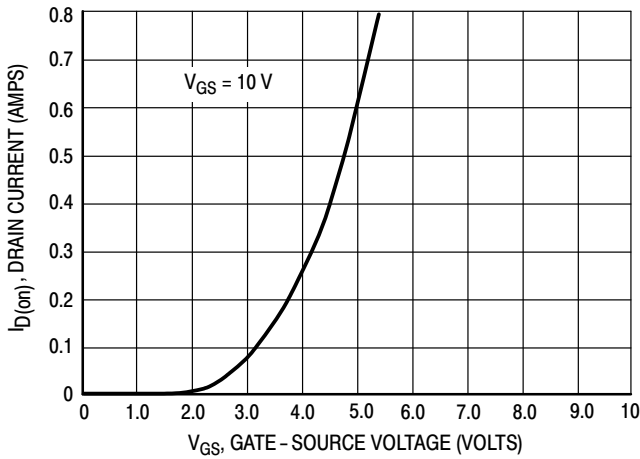


Figure 5. Transfer Characteristic

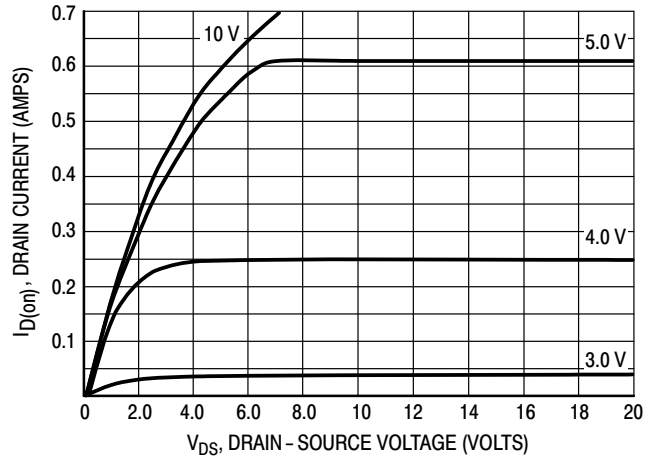


Figure 6. Output Characteristic

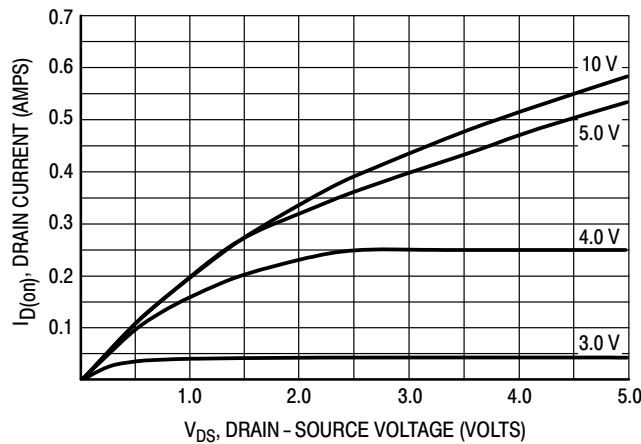
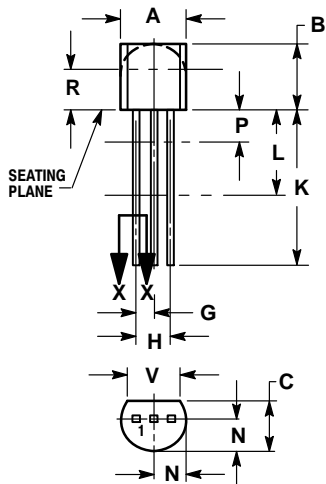
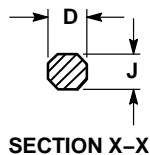


Figure 7. Saturation Characteristic

BS107A**PACKAGE DIMENSIONS****TO-92 (TO-226)**

CASE 29-11

ISSUE AM

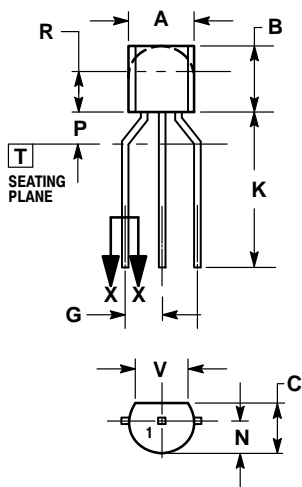
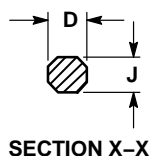
STRAIGHT LEAD
BULK PACK

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.
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

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