

BSS84LT1

Power MOSFET 130 mA, 50 V P-Channel SOT-23

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry. Typical applications are DC-DC converters, load switching, power management in portable and battery-powered products such as computers, printers, cellular and cordless telephones.

Features

- Energy Efficient
- Miniature SOT-23 Surface Mount Package Saves Board Space
- Pb-Free Package is Available

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|-------------------|----------------|--------------------|
| Drain-to-Source Voltage | V_{DS} | 50 | Vdc |
| Gate-to-Source Voltage – Continuous | V_{GS} | ± 20 | Vdc |
| Drain Current – Continuous @ $T_A = 25^\circ\text{C}$ – Pulsed Drain Current ($t_p \leq 10 \mu\text{s}$) | I_D I_{DM} | 130 520 | mA |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | P_D | 225 | mW |
| Operating and Storage Temperature Range | T_J, T_{stg} | -55 to 150 | $^\circ\text{C}$ |
| Thermal Resistance – Junction-to-Ambient | $R_{\theta JA}$ | 556 | $^\circ\text{C/W}$ |
| Maximum Lead Temperature for Soldering Purposes, for 10 seconds | T_L | 260 | $^\circ\text{C}$ |

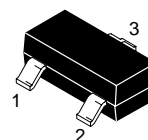
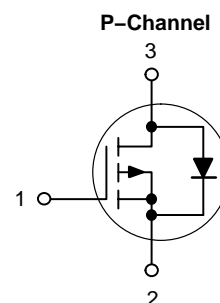
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



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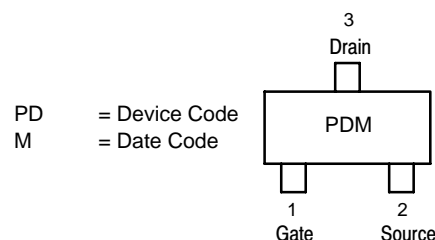
<http://onsemi.com>

130 mA, 50 V $R_{DS(on)} = 10 \Omega$



**SOT-23
CASE 318
STYLE 21**

MARKING DIAGRAM & PIN ASSIGNMENT



ORDERING INFORMATION

| Device | Package | Shipping† |
|-----------|------------------|------------------|
| BSS84LT1 | SOT-23 | 3000 Tape & Reel |
| BSS84LT1G | SOT-23 (Pb-Free) | 3000 Tape & Reel |

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---|---------------|-------------|-------------|-----------------|-----------------|
| Drain-to-Source Breakdown Voltage ($V_{GS} = 0\text{ Vdc}$, $I_D = 250\text{ }\mu\text{Adc}$) | $V_{(BR)DSS}$ | 50 | – | – | Vdc |
| Zero Gate Voltage Drain Current ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$) ($V_{DS} = 50\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$) ($V_{DS} = 50\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$, $T_J = 125^\circ\text{C}$) | I_{DSS} | – – – | – – – | 0.1 15 60 | μAdc |
| Gate-Body Leakage Current ($V_{GS} = \pm 20\text{ Vdc}$, $V_{DS} = 0\text{ Vdc}$) | I_{GSS} | – | – | ± 10 | nAdc |

ON CHARACTERISTICS (Note 1)

| | | | | | |
|--|--------------|-----|-----|-----|----------|
| Gate-Source Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$) | $V_{GS(th)}$ | 0.9 | – | 2.0 | Vdc |
| Static Drain-to-Source On-Resistance ($V_{GS} = 5.0\text{ Vdc}$, $I_D = 100\text{ mAdc}$) | $R_{DS(on)}$ | – | 5.0 | 10 | Ω |
| Transfer Admittance ($V_{DS} = 25\text{ Vdc}$, $I_D = 100\text{ mAdc}$, $f = 1.0\text{ kHz}$) | $ y_{fs} $ | 50 | – | – | mS |

DYNAMIC CHARACTERISTICS

| | | | | | | |
|----------------------|---------------------------|-----------|---|-----|---|----|
| Input Capacitance | $V_{DS} = 5.0\text{ Vdc}$ | C_{iss} | – | 30 | – | pF |
| Output Capacitance | $V_{DS} = 5.0\text{ Vdc}$ | C_{oss} | – | 10 | – | |
| Transfer Capacitance | $V_{DG} = 5.0\text{ Vdc}$ | C_{rss} | – | 5.0 | – | |

SWITCHING CHARACTERISTICS (Note 2)

| | | | | | | |
|---------------------|---|--------------|---|------|---|----|
| Turn-On Delay Time | $V_{DD} = -15\text{ Vdc}$, $I_D = -2.5\text{ Adc}$, $R_L = 50\text{ }\Omega$ | $t_{d(on)}$ | – | 2.5 | – | ns |
| Rise Time | | t_r | – | 1.0 | – | |
| Turn-Off Delay Time | | $t_{d(off)}$ | – | 16 | – | |
| Fall Time | | t_f | – | 8.0 | – | |
| Gate Charge | | Q_T | – | 6000 | – | pC |

SOURCE-DRAIN DIODE CHARACTERISTICS

| | | | | | | |
|--------------------------|--|-----------------|---|---|-------|---|
| Continuous Current | | I _S | – | – | 0.130 | A |
| Pulsed Current | | I _{SM} | – | – | 0.520 | |
| Forward Voltage (Note 2) | V _{GS} = 0 V, I _S = 130 mA | V _{SD} | – | – | 2.2 | V |

1. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$.
2. Switching characteristics are independent of operating junction temperature.

TYPICAL ELECTRICAL CHARACTERISTICS

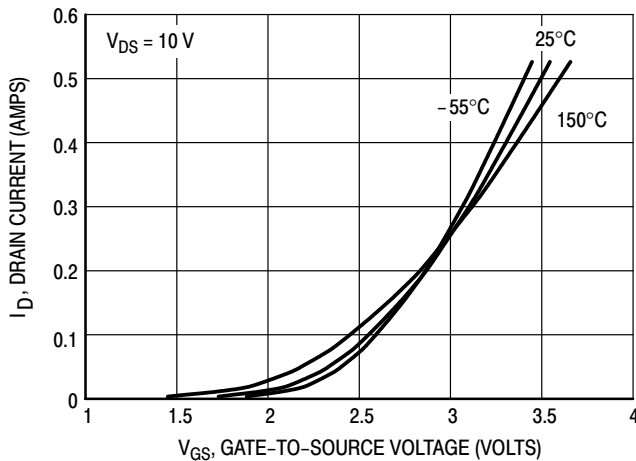


Figure 1. Transfer Characteristics

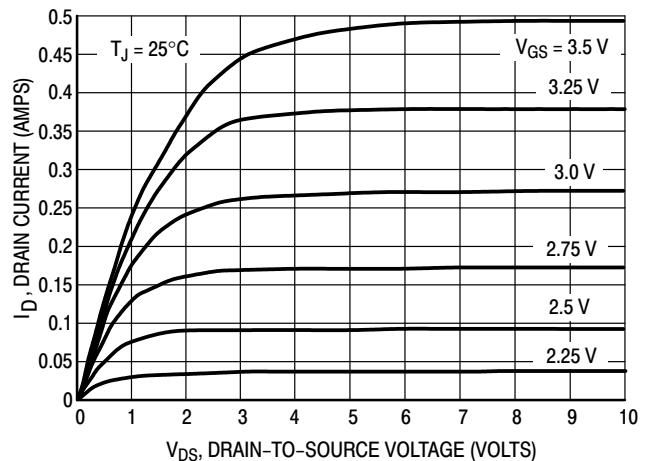


Figure 2. On-Region Characteristics

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TYPICAL ELECTRICAL CHARACTERISTICS

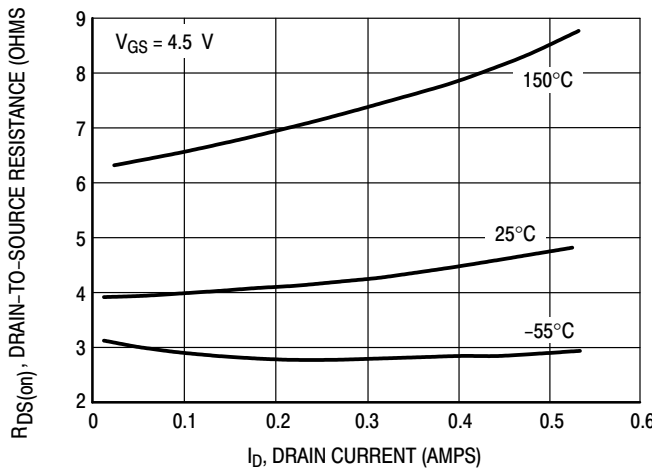


Figure 3. On-Resistance versus Drain Current

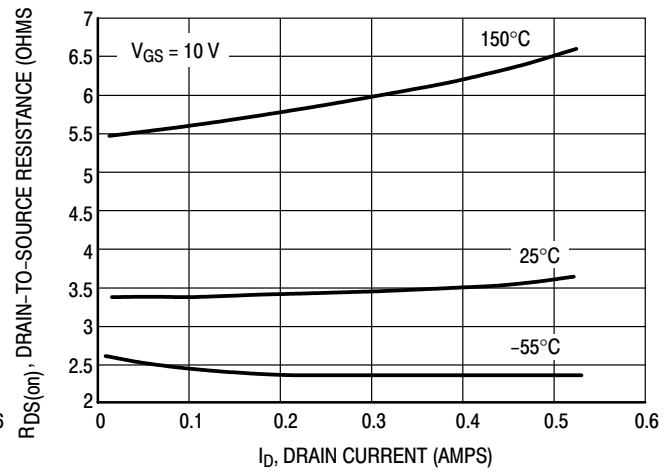


Figure 4. On-Resistance versus Drain Current

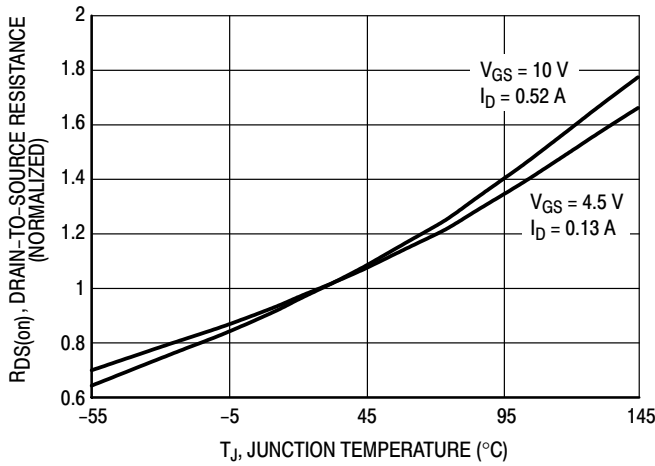


Figure 5. On-Resistance Variation with Temperature

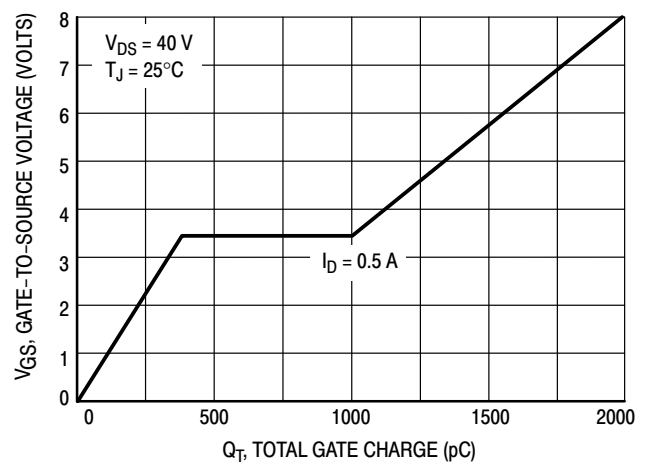


Figure 6. Gate Charge

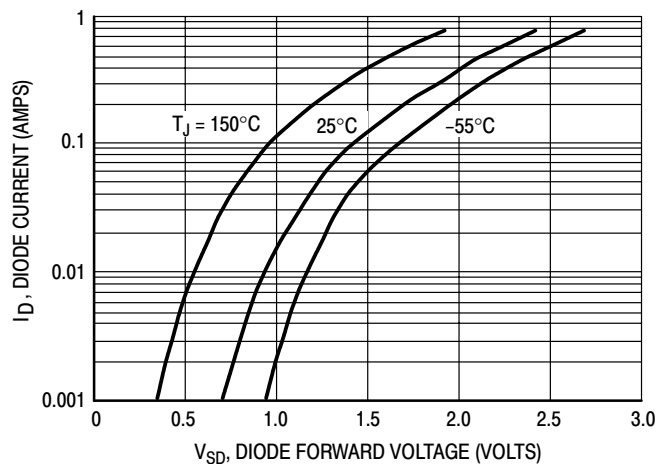
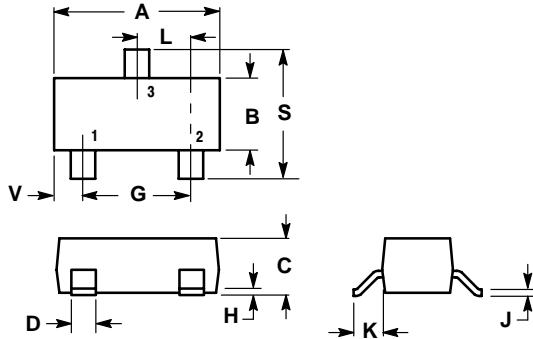


Figure 7. Body Diode Forward Voltage

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PACKAGE DIMENSIONS

SOT-23 (TO-236)
CASE 318-08
ISSUE AH



NOTES:

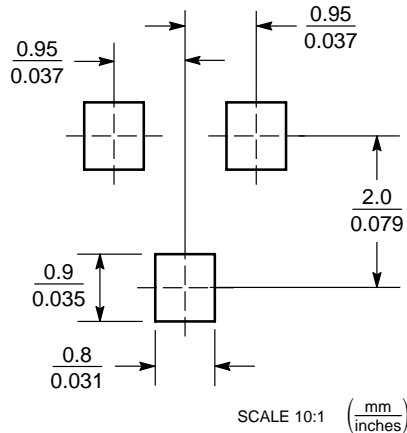
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-03 AND -07 OBSOLETE, NEW STANDARD 318-08.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|--------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.1102 | 0.1197 | 2.80 | 3.04 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 |
| C | 0.0350 | 0.0440 | 0.89 | 1.11 |
| D | 0.0150 | 0.0200 | 0.37 | 0.50 |
| G | 0.0701 | 0.0807 | 1.78 | 2.04 |
| H | 0.0005 | 0.0040 | 0.013 | 0.100 |
| J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| K | 0.0140 | 0.0285 | 0.35 | 0.69 |
| L | 0.0350 | 0.0401 | 0.89 | 1.02 |
| S | 0.0830 | 0.1039 | 2.10 | 2.64 |
| V | 0.0177 | 0.0236 | 0.45 | 0.60 |

STYLE 21:


- PIN 1. GATE
- SOURCE
- DRAIN

SOLDERING FOOTPRINT*



SCALE 10:1 (mm/inches)

*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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