

# 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	$V_{GS}$	$\pm 20$	Vdc
Drain Current <ul style="list-style-type: none"><li>– Continuous @ <math>T_A = 25^\circ\text{C}</math></li><li>– Pulsed Drain Current (<math>t_p \leq 10 \mu\text{s}</math>)</li></ul>	$I_D$ $I_{DM}$	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	$^\circ\text{C}$

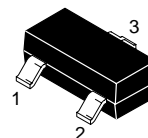
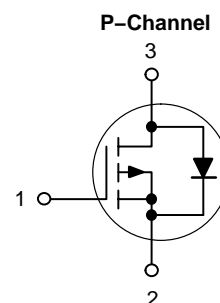
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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



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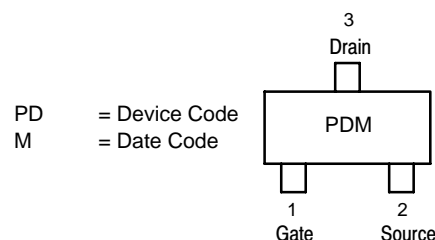
<http://onsemi.com>

**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.

# BSS84LT1

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### 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	$\mu\text{Adc}$
Gate-Body Leakage Current ( $V_{GS} = \pm 20\text{ Vdc}$ , $V_{DS} = 0\text{ Vdc}$ )	$I_{GSS}$	–	–	$\pm 10$	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	$\Omega$
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 <sub>S</sub>	–	–	0.130	A
Pulsed Current		I <sub>SM</sub>	–	–	0.520	
Forward Voltage (Note 2)	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 130 mA	V <sub>SD</sub>	–	–	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

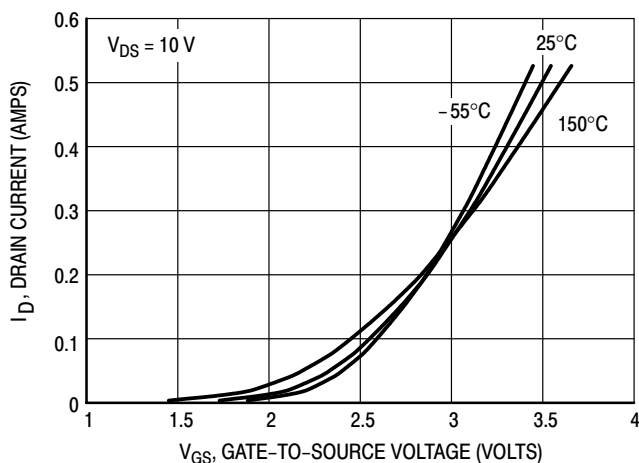


Figure 1. Transfer Characteristics

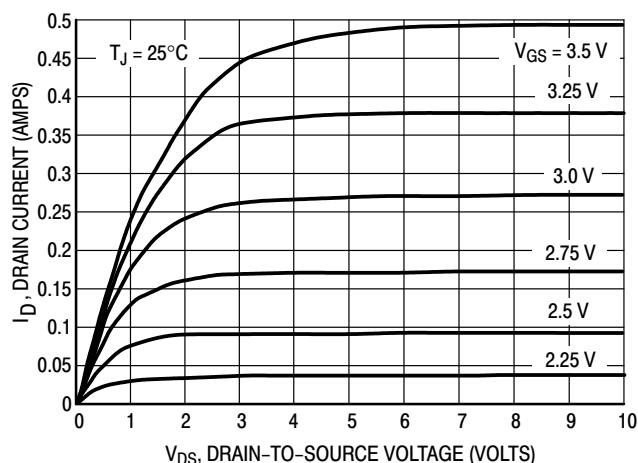


Figure 2. On-Region Characteristics

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## TYPICAL ELECTRICAL CHARACTERISTICS

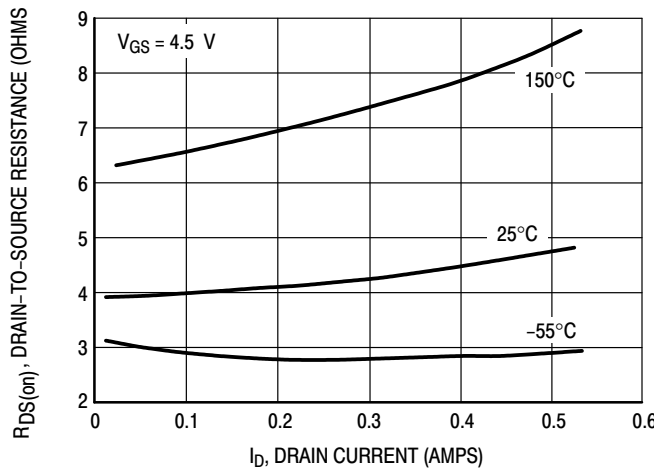


Figure 3. On-Resistance versus Drain Current

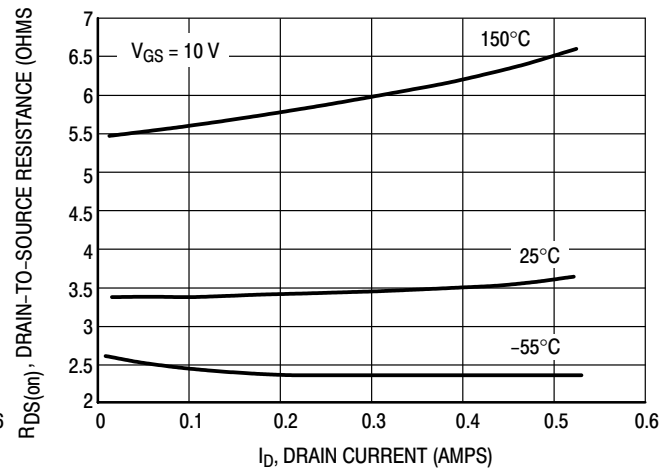


Figure 4. On-Resistance versus Drain Current

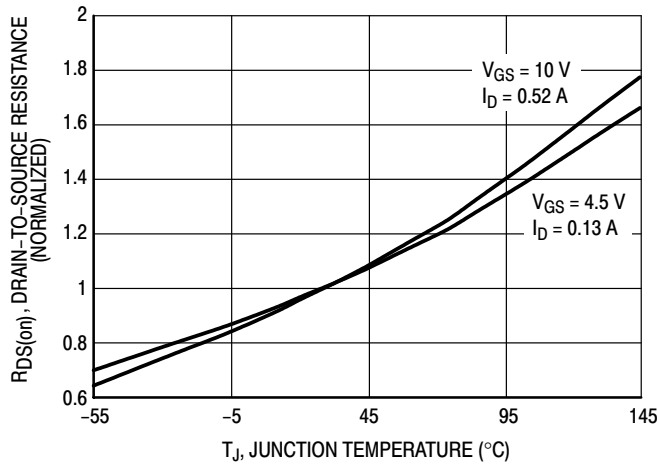


Figure 5. On-Resistance Variation with Temperature

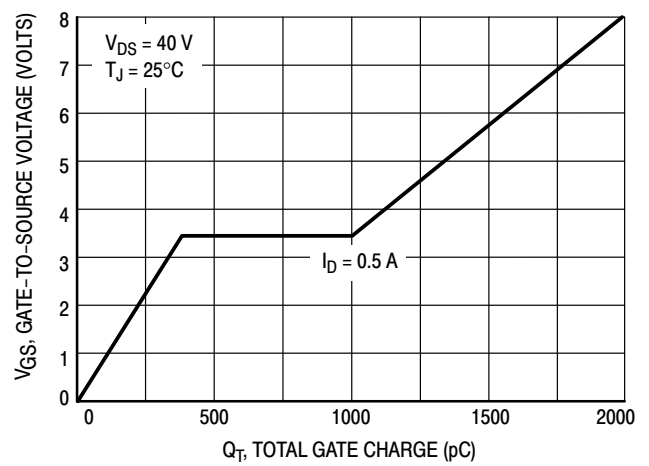


Figure 6. Gate Charge

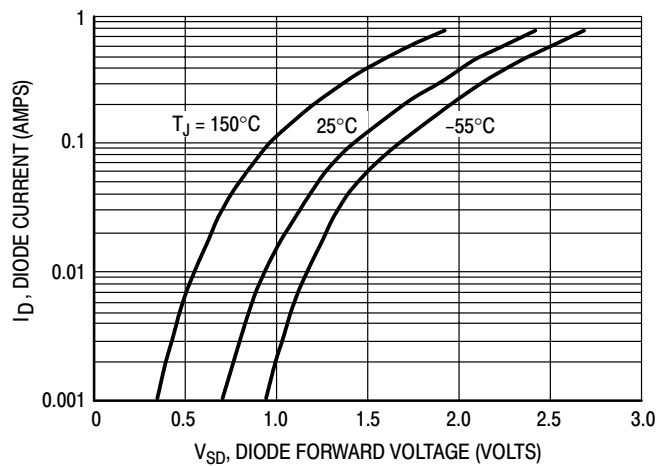


Figure 7. Body Diode Forward Voltage

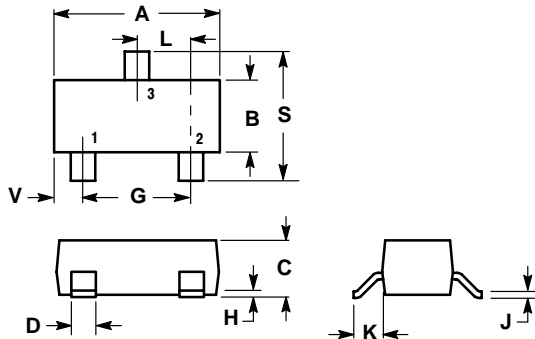
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## PACKAGE DIMENSIONS

### SOT-23 (TO-236)

CASE 318-08

ISSUE AH



#### NOTES:

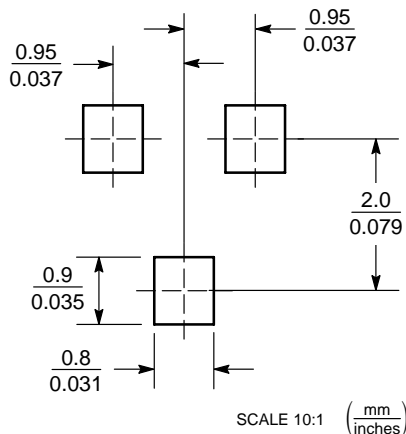
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-03 AND -07 OBSOLETE, NEW STANDARD 318-08.

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:

1. GATE
2. SOURCE
3. DRAIN

### SOLDERING FOOTPRINT\*



\*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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