

# BSS84L, BVSS84L

## Power MOSFET Single P-Channel SOT-23 -50 V, 10 Ω

- SOT-23 Surface Mount Package Saves Board Space
- BV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

### 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 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	$^\circ\text{C}$

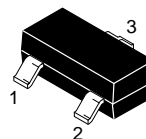
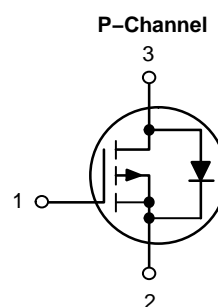
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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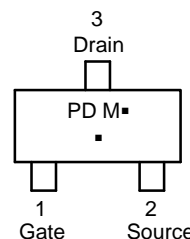
[www.onsemi.com](http://www.onsemi.com)

$V_{(BR)DSS}$	$R_{DS(ON) MAX}$
-50 V	10 Ω @ 10 V



SOT-23  
CASE 318  
STYLE 21

### MARKING DIAGRAM & PIN ASSIGNMENT



PD = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

(\*Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping†
BSS84LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BVSS84LT1G	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.

# BSS84L, BVSS84L

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Drain-to-Source Breakdown Voltage ( $V_{GS} = 0\text{ Vdc}$ , $I_D = -250\ \mu\text{Adc}$ )	$V_{(BR)DSS}$	-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 ( $V_{DS} = V_{GS}$ , $I_D = -250\ \mu\text{A}$ )	$V_{GS(th)}$	-0.9	-	-2.0	Vdc
Static Drain-to-Source On-Resistance ( $V_{GS} = -5.0\text{ Vdc}$ , $I_D = -100\ \text{mAdc}$ )	$R_{DS(on)}$	-	4.7	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	$V_{DS} = 5.0\text{ Vdc}$	$C_{iss}$	-	36	-	pF
Output Capacitance	$V_{DS} = 5.0\text{ Vdc}$	$C_{oss}$	-	17	-	
Transfer Capacitance	$V_{DG} = 5.0\text{ Vdc}$	$C_{rss}$	-	6.5	-	

### SWITCHING CHARACTERISTICS (Note 2)

Turn-On Delay Time	$V_{DD} = -15\text{ Vdc}$ , $I_D = -2.5\text{ Adc}$ , $R_L = 50\ \Omega$	$t_{d(on)}$	-	3.6	-	ns
Rise Time		$t_r$	-	9.7	-	
Turn-Off Delay Time		$t_{d(off)}$	-	12	-	
Fall Time		$t_f$	-	1.7	-	
Gate Charge	$V_{DD} = -40\text{ Vdc}$ , $I_D = -0.5\text{ A}$ , $V_{GS} = -10\text{ V}$	$Q_T$	-	2.2	-	nC

### SOURCE-DRAIN DIODE CHARACTERISTICS

Continuous Current		$I_S$	-	-	-0.130	A
Pulsed Current		$I_{SM}$	-	-	-0.520	
Forward Voltage (Note 2)	$V_{GS} = 0\text{ V}$ , $I_S = -130\text{ mA}$	$V_{SD}$	-	-	-2.2	V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

## TYPICAL ELECTRICAL CHARACTERISTICS

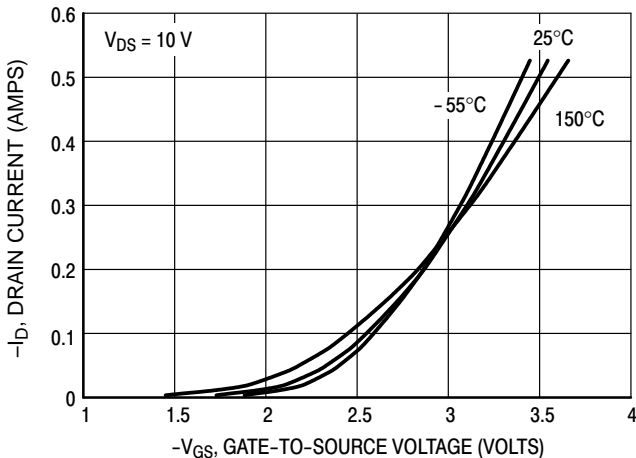


Figure 1. Transfer Characteristics

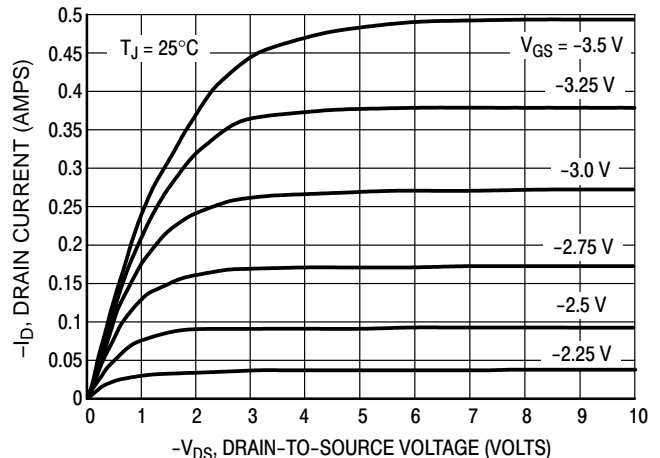


Figure 2. On-Region Characteristics

# BSS84L, BVSS84L

## TYPICAL ELECTRICAL CHARACTERISTICS

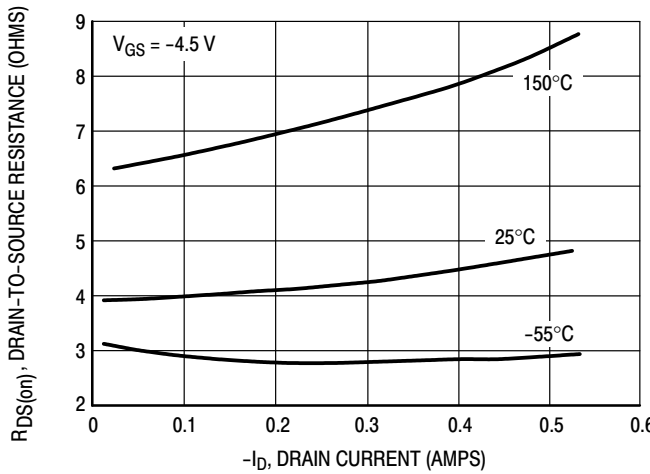


Figure 3. On-Resistance versus Drain Current

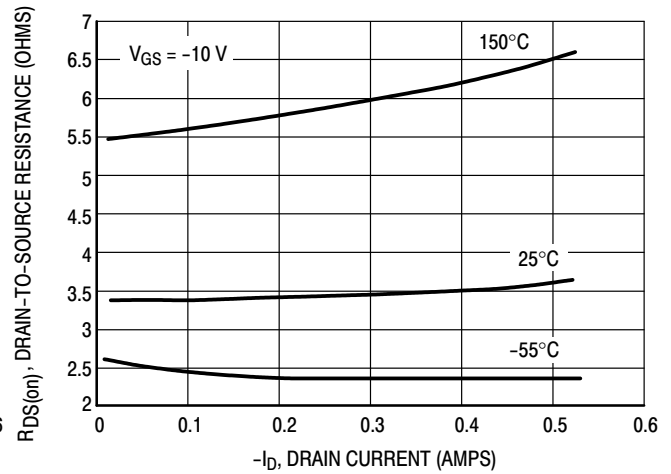


Figure 4. On-Resistance versus Drain Current

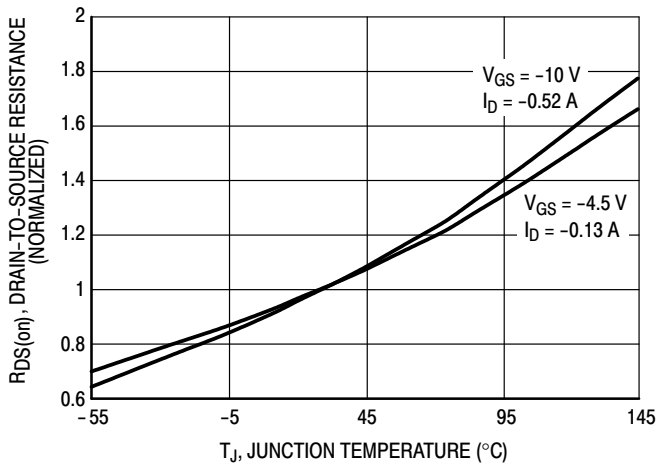


Figure 5. On-Resistance Variation with Temperature



Figure 6. Gate Charge

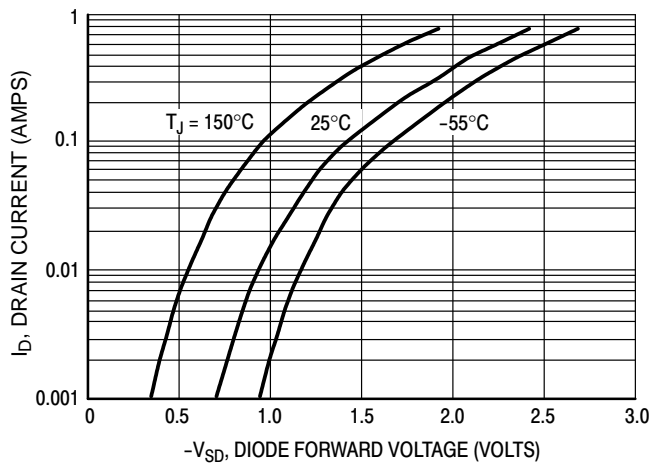
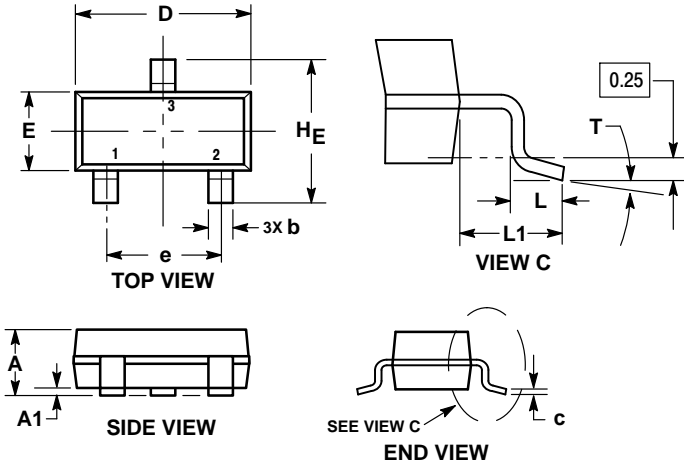


Figure 7. Body Diode Forward Voltage

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## PACKAGE DIMENSIONS

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

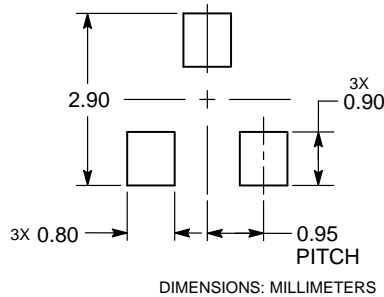


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: MILLIMETERS.
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
  4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
HE	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	---	10°	0°	---	10°

- STYLE 21:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

### RECOMMENDED 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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