

# BSS123LT1

Preferred Device

## Power MOSFET 170 mAmps, 100 Volts

N-Channel SOT-23

### Features

- Pb-Free Packages are Available

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	100	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
- Continuous	$V_{GS}$	$\pm 40$	Vpk
- Non-repetitive ( $t_p \leq 50 \mu s$ )			
Drain Current	$I_D$	0.17	Adc
- Continuous (Note 1)	$I_{DM}$	0.68	
- Pulsed (Note 2)			

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.

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 3) $T_A = 25^\circ C$ Derate above $25^\circ C$	$P_D$	225 1.8	mW mW/ $^\circ C$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ C/W$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ C$

- The Power Dissipation of the package may result in a lower continuous drain current.
- Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 2.0\%$ .
- FR-5 =  $1.0 \times 0.75 \times 0.062$  in.

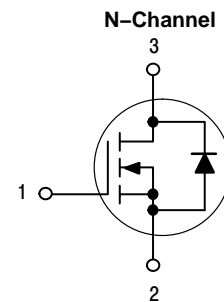


ON Semiconductor®

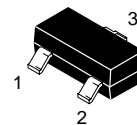
<http://onsemi.com>

**170 mAmps**  
**100 VOLTS**

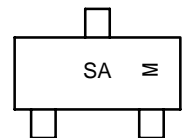
$R_{DS(on)} = 6 \Omega$



### MARKING DIAGRAM

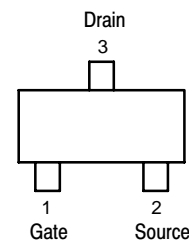


SOT-23  
CASE 318  
STYLE 21



SA = Device Code  
M = Date Code

### PIN ASSIGNMENT



### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

**Preferred** devices are recommended choices for future use and best overall value.

# BSS123LT1

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Drain–Source Breakdown Voltage ( $V_{GS} = 0, I_D = 250 \mu\text{A}$ )	$V_{(BR)DSS}$	100	–	–	Vdc
Zero Gate Voltage Drain Current ( $V_{GS} = 0, V_{DS} = 100 \text{ Vdc}$ )	$I_{DSS}$	–	–	15 60	$\mu\text{A}$
Gate–Body Leakage Current ( $V_{GS} = 20 \text{ Vdc}, V_{DS} = 0$ )	$I_{GSS}$	–	–	50	nA

## ON CHARACTERISTICS (Note 4)

Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1.0 \text{ mA}$ )	$V_{GS(th)}$	0.8	–	2.8	Vdc
Static Drain–Source On–Resistance ( $V_{GS} = 10 \text{ Vdc}, I_D = 100 \text{ mA}$ )	$r_{DS(on)}$	–	5.0	6.0	$\Omega$
Forward Transconductance ( $V_{DS} = 25 \text{ Vdc}, I_D = 100 \text{ mA}$ )	$g_{fs}$	80	–	–	mmhos

## DYNAMIC CHARACTERISTICS

Input Capacitance ( $V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$ )	$C_{iss}$	–	20	–	pF
Output Capacitance ( $V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$ )	$C_{oss}$	–	9.0	–	pF
Reverse Transfer Capacitance ( $V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$ )	$C_{rss}$	–	4.0	–	pF

## SWITCHING CHARACTERISTICS<sup>(4)</sup>

Turn–On Delay Time	( $V_{CC} = 30 \text{ Vdc}, I_C = 0.28 \text{ A}$ , $V_{GS} = 10 \text{ Vdc}, R_{GS} = 50 \Omega$ )	$t_{d(on)}$	–	20	–	ns
Turn–Off Delay Time		$t_{d(off)}$	–	40	–	ns

## REVERSE DIODE

Diode Forward On–Voltage ( $I_D = 0.34 \text{ A}$ , $V_{GS} = 0 \text{ Vdc}$ )	$V_{SD}$	–	–	1.3	V
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4. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

## ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
BSS123LT1	SOT–23	3,000 Tape & Reel
BSS123LT1G	SOT–23 (Pb–Free)	3,000 Tape & Reel
BSS123LT3	SOT–23	10,000 Tape & Reel
BSS123LT3G	SOT–23 (Pb–Free)	10,000 Tape & Reel

<sup>†</sup>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.

# BSS123LT1

## TYPICAL ELECTRICAL CHARACTERISTICS

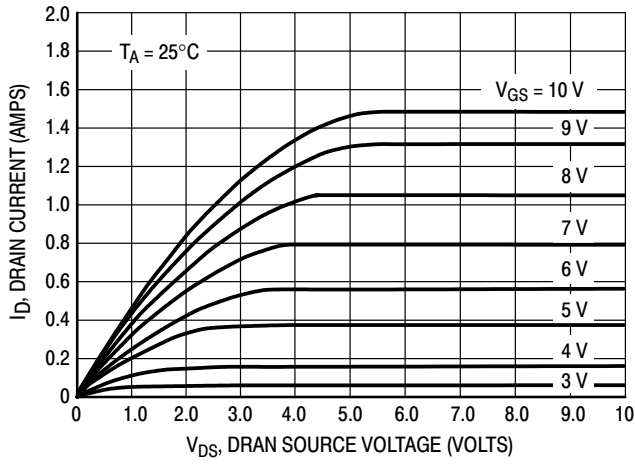


Figure 1. Ohmic Region

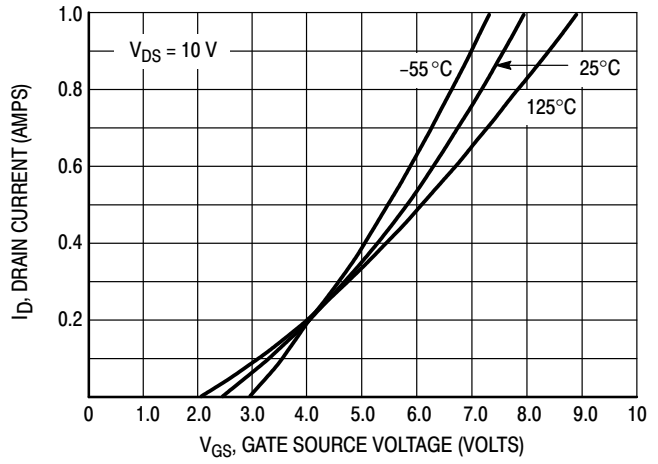


Figure 2. Transfer Characteristics

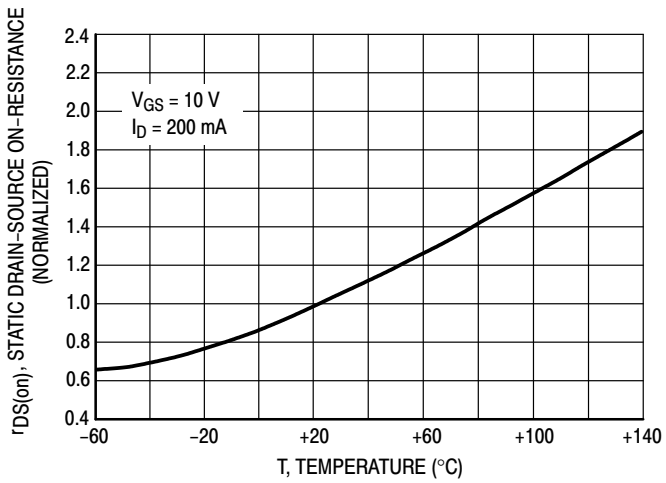


Figure 3. Temperature versus Static Drain-Source On-Resistance

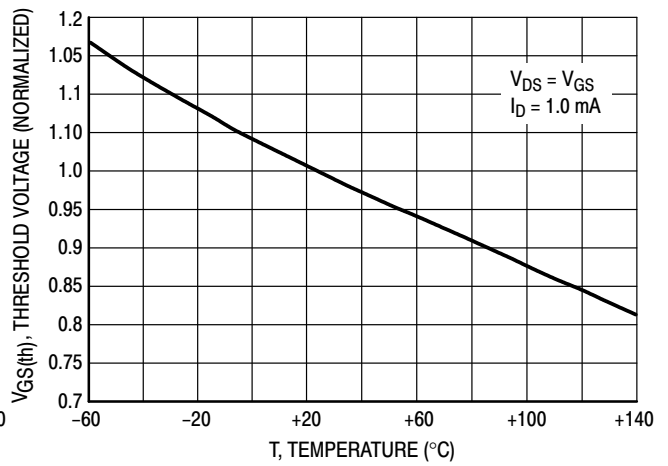
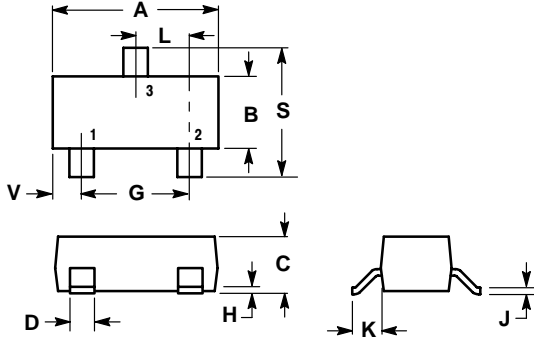


Figure 4. Temperature versus Gate Threshold Voltage

# BSS123LT1

## PACKAGE DIMENSIONS

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



NOTES:

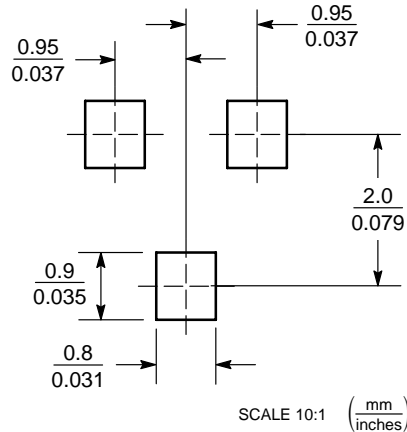
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

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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