# BSS123LT1G, BVSS123LT1G

# Power MOSFET 170 mAmps, 100 Volts

## N-Channel SOT-23

#### Features

- BVSS 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

Rating	Symbol	Value	Unit	
Drain-Source Voltage	V <sub>DSS</sub>	100	Vdc	
Gate–Source Voltage – Continuous – Non–repetitive (t <sub>p</sub> ≤ 50 μs)	V <sub>GS</sub> V <sub>GSM</sub>	±20 ±40	Vdc Vpk	
Drain Current – Continuous (Note 1) – Pulsed (Note 2)	I <sub>D</sub> I <sub>DM</sub>	0.17 0.68	Adc	

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.

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 3) T <sub>A</sub> = 25°C Derate above 25°C	PD	225 1.8	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	°C/W
Junction and Storage Temperature	T <sub>J</sub> , T <sub>stq</sub>	-55 to +150	°C

 The Power Dissipation of the package may result in a lower continuous drain current.

2. Pulse Width  $\leq$  300 µs, Duty Cycle  $\leq$  2.0%.

3. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.

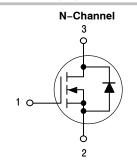


## **ON Semiconductor®**

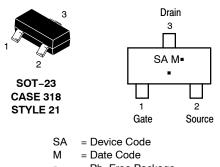
http://onsemi.com

170 mAMPS 100 VOLTS

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



MARKING DIAGRAM & PIN ASSIGNMENT



= Pb–Free Package

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

\*Date Code orientation and/or position may vary depending upon manufacturing location.

## ORDERING INFORMATION

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

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#### **ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted)

Charac	Symbol	Min	Тур	Max	Unit	
OFF CHARACTERISTICS						
Drain–Source Breakdown Voltage ( $V_{GS}$ = 0, $I_D$ = 250 $\mu$ Adc)	V <sub>(BR)DSS</sub>	100	_	-	Vdc	
Zero Gate Voltage Drain Current $      (V_{GS} = 0,  V_{DS} = 100  Vdc) \qquad T_J = 25^\circ C \\ T_J = 125^\circ C $	IDSS			15 60	μAdc	
Gate-Body Leakage Current (V <sub>GS</sub> = 20 Vdc, V <sub>DS</sub> = 0)	I <sub>GSS</sub>	-	-	50	nAdc	
ON CHARACTERISTICS (Note 4)			•		•	+
Gate Threshold Voltage $(V_{DS} = V_{GS}, I_D = 1.0 \text{ mAdc})$	V <sub>GS(th)</sub>	1.6	_	2.6	Vdc	
Static Drain–Source On–Resistance $(V_{GS} = 10 \text{ Vdc}, I_D = 100 \text{ mAdc})$	r <sub>DS(on)</sub>	-	-	6.0	Ω	
Forward Transconductance (V <sub>DS</sub> = 25 Vdc, I <sub>D</sub> = 100 mAdc)	9fs	80	-	-	mmhos	
DYNAMIC CHARACTERISTICS		·	•	•	•	
Input Capacitance (V <sub>DS</sub> = 25 Vdc, V <sub>GS</sub> = 0, f = 1.0 MHz)		C <sub>iss</sub>	-	20	-	pF
Output Capacitance ( $V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$ )		C <sub>oss</sub>	-	9.0	-	pF
Reverse Transfer Capacitance (V <sub>DS</sub> = 25 Vdc, V <sub>GS</sub> = 0, f = 1.0 MHz)	C <sub>rss</sub>	-	4.0	-	pF	
SWITCHING CHARACTERISTICS <sup>(4)</sup>						
Turn-On Delay Time	(V <sub>CC</sub> = 30 Vdc, I <sub>C</sub> = 0.28 Adc,	t <sub>d(on)</sub>	-	20	-	ns
Turn-Off Delay Time	$V_{GS}$ = 10 Vdc, $R_{GS}$ = 50 $\Omega$ )	t <sub>d(off)</sub>	-	40	-	ns
REVERSE DIODE	•	•	•		•	÷
Diode Forward On–Voltage ( $I_D = 0.34$ Adc, $V_{GS} = 0$ Vdc)		V <sub>SD</sub>	-	-	1.3	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. 4. Pulse Test: Pulse Width  $\leq$  300 µs, Duty Cycle  $\leq$  2.0%.

#### ORDERING INFORMATION

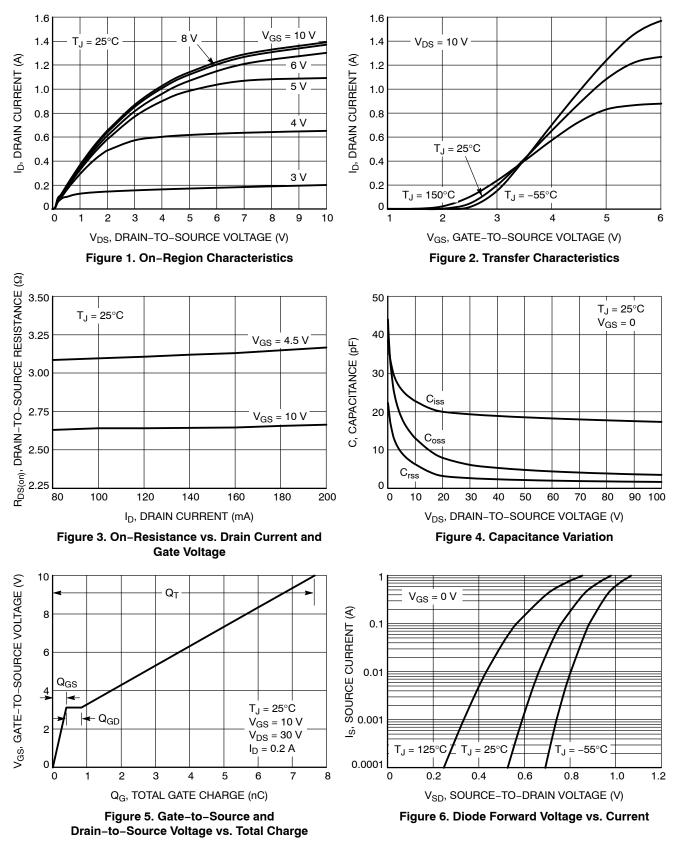
Device	Package	Shipping <sup>†</sup>
BSS123LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BSS123LT3G	SOT-23 (Pb-Free)	10000 / Tape & Reel
BVSS123LT1G*	SOT-23 (Pb-Free)	3000 / Tape & Reel

+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.

\*BVSS Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q101 Qualified and PPAP Capable.

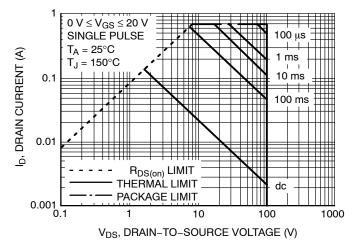
## BSS123LT1G, BVSS123LT1G

## **TYPICAL ELECTRICAL CHARACTERISTICS**

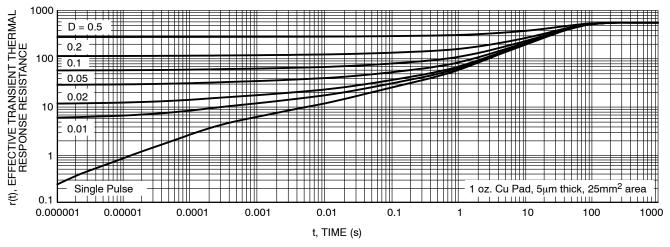


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## **TYPICAL ELECTRICAL CHARACTERISTICS**



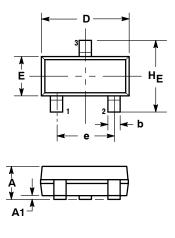


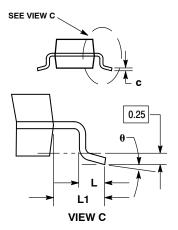




#### PACKAGE DIMENSIONS

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





NOTES:

STYLE 21: PIN 1. GATE

SOURCE

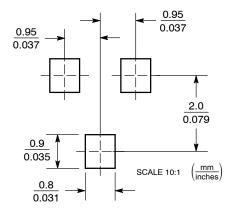
2.

3. DRAIN

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  CONTROLLING DIMENSION: INCH.
- CONTROLLING DIMENSION: INCH.
  MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
- 4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
Α	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
Е	1.20	1.30	1.40	0.047	0.051	0.055
е	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°		10°	0°		10°

#### 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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