

# BSS123LT1G, BVSS123LT1G

## Power MOSFET 170 mAmps, 100 Volts

### N-Channel SOT-23

#### Features

- AEC-Q101 Qualified and PPAP Capable – BVSS123LT1G
- These Devices are Pb-Free and are RoHS Compliant

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	100	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
– Continuous	$V_{GSM}$	$\pm 40$	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)			

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

#### 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	$^\circ C$

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



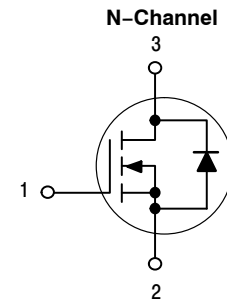
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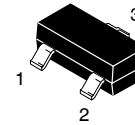
**170 mAmps**

**100 VOLTS**

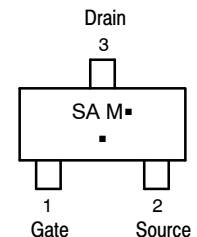
**$R_{DS(on)} = 6 \Omega$**



#### MARKING DIAGRAM & PIN ASSIGNMENT



**SOT-23  
CASE 318  
STYLE 21**



SA = Device Code  
M = Date Code  
▪ = 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.

# BSS123LT1G, BVSS123LT1G

## 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 ( $V_{GS} = 0, I_D = 250 \mu\text{Adc}$ )	$V_{(BR)DSS}$	100	-	-	Vdc
Zero Gate Voltage Drain Current ( $V_{GS} = 0, V_{DS} = 100 \text{Vdc}$ ) $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	$I_{DSS}$	-	-	15 60	$\mu\text{Adc}$
Gate-Body Leakage Current ( $V_{GS} = 20 \text{Vdc}, V_{DS} = 0$ )	$I_{GSS}$	-	-	50	nAdc

## ON CHARACTERISTICS (Note 4)

Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1.0 \text{mAdc}$ )	$V_{GS(th)}$	0.8	-	2.8	Vdc
Static Drain-Source On-Resistance ( $V_{GS} = 10 \text{Vdc}, I_D = 100 \text{mAdc}$ )	$r_{DS(on)}$	-	5.0	6.0	$\Omega$
Forward Transconductance ( $V_{DS} = 25 \text{Vdc}, I_D = 100 \text{mAdc}$ )	$g_{fs}$	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	$(V_{CC} = 30 \text{Vdc}, I_C = 0.28 \text{Adc},$ $V_{GS} = 10 \text{Vdc}, R_{GS} = 50 \Omega)$	$t_{d(on)}$	-	20	-	ns
Turn-Off Delay Time		$t_{d(off)}$	-	40	-	ns

## REVERSE DIODE

Diode Forward On-Voltage ( $I_D = 0.34 \text{Adc}, V_{GS} = 0 \text{Vdc}$ )	$V_{SD}$	-	-	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>
BSS123LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BSS123LT3G	SOT-23 (Pb-Free)	10000 / Tape & Reel
BVSS123LT1G	SOT-23 (Pb-Free)	3000 / 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.

# BSS123LT1G, BVSS123LT1G

## TYPICAL ELECTRICAL CHARACTERISTICS

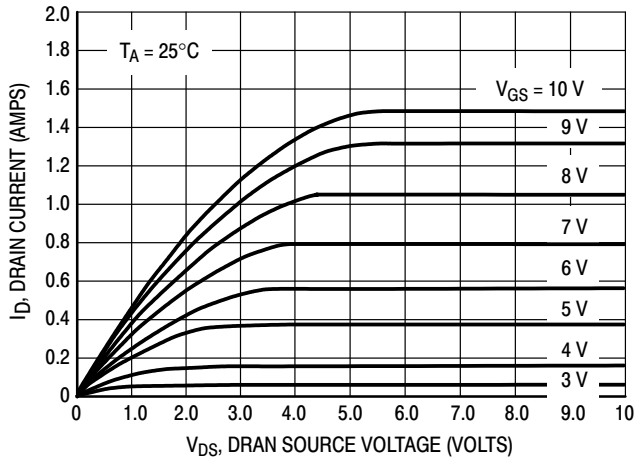


Figure 1. Ohmic Region

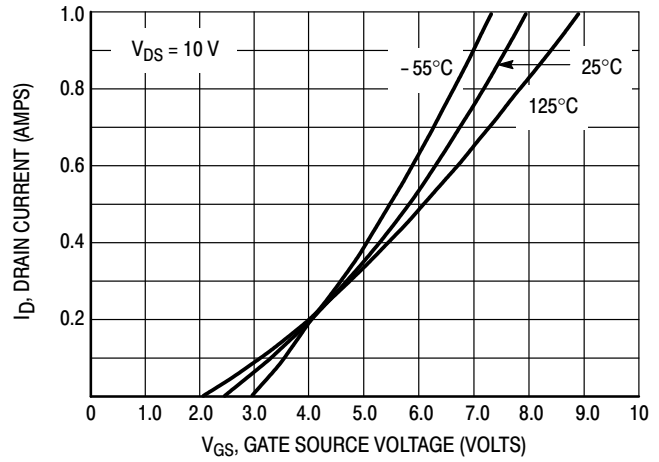


Figure 2. Transfer Characteristics

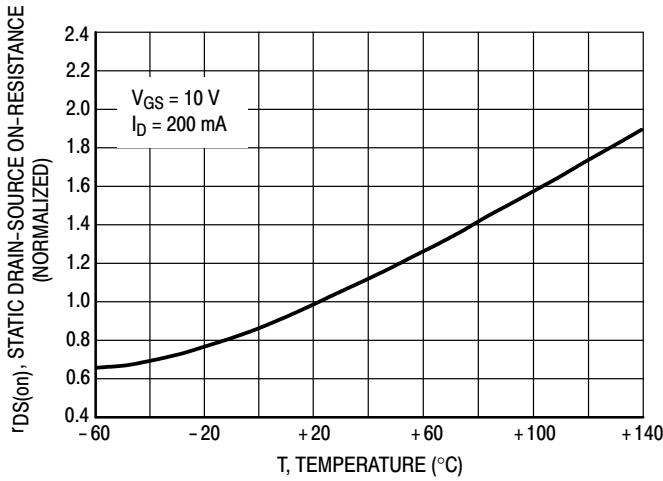


Figure 3. Temperature versus Static Drain-Source On-Resistance

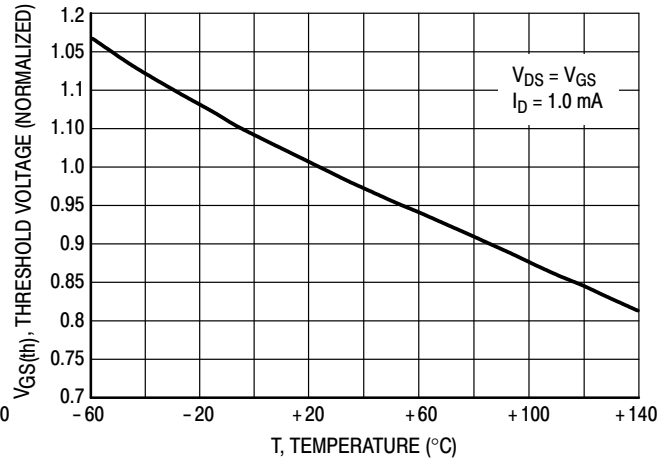


Figure 4. Temperature versus Gate Threshold Voltage

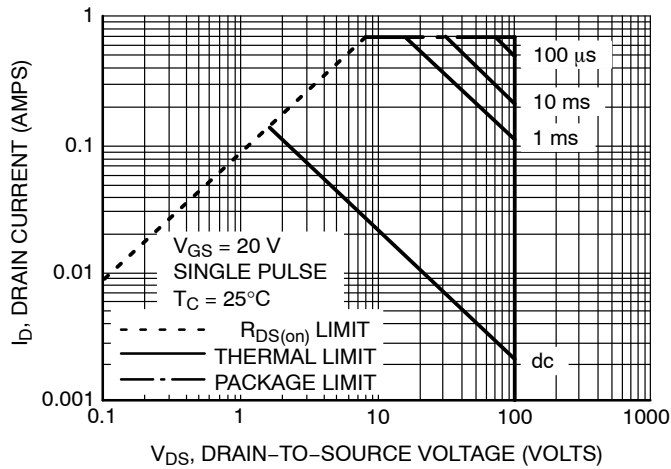


Figure 5. Maximum Rated Forward Biased Safe Operating Area

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## TYPICAL ELECTRICAL CHARACTERISTICS

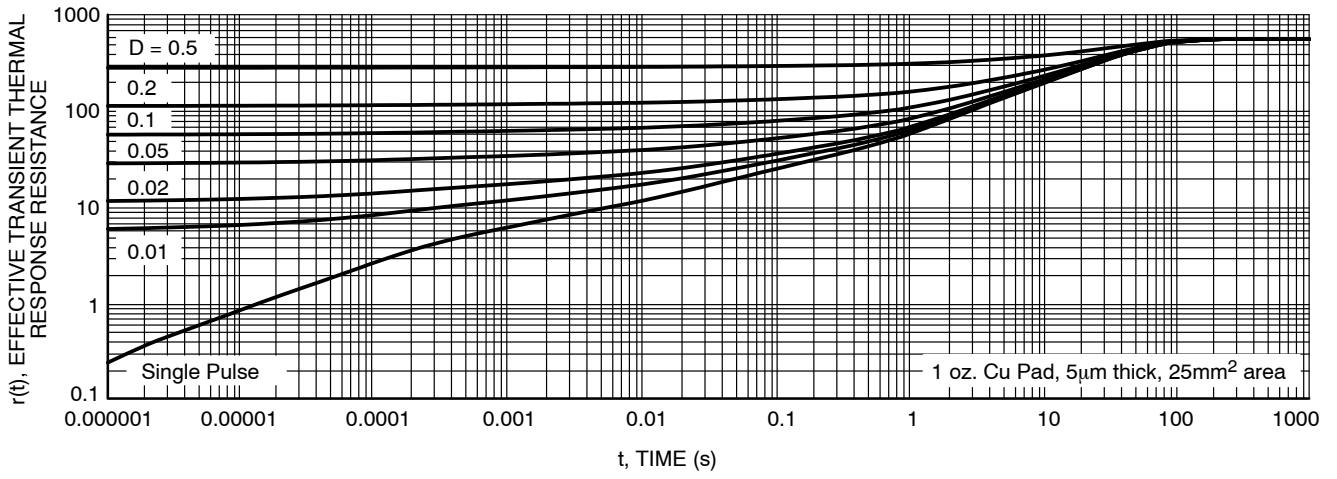
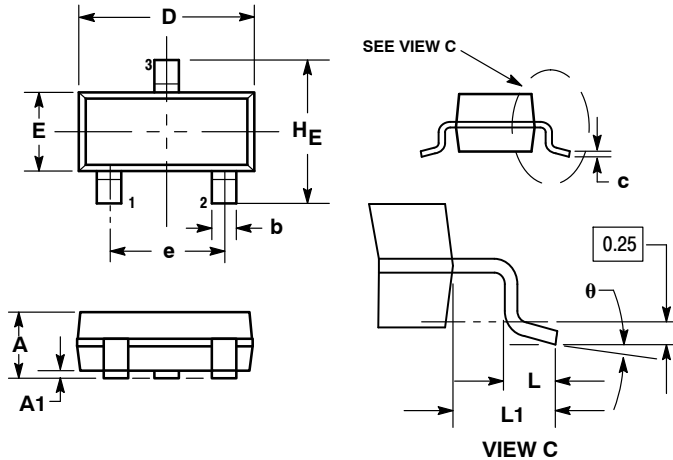


Figure 6. Thermal Response

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## PACKAGE DIMENSIONS

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

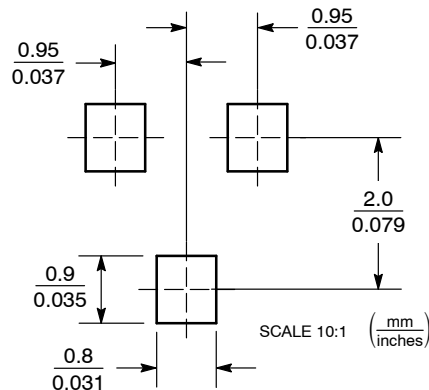


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
  4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	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
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
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°

STYLE 21:  
PIN 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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