# **Switching Transistor**

# **NPN Silicon**

### Features

• Pb–Free Package is Available

#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	V <sub>CEO</sub>	12	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	20	Vdc
Collector Current – Continuous	Ι <sub>C</sub>	100	mAdc

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board, (Note 1) $T_A = 25^{\circ}C$ Derate above 25°C	PD	225 1.8	mW m₩/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (Note 2) T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	300 2.4	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\thetaJA}$	417	°C/W
Junction and Storage Temperature	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°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.

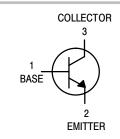
1.  $FR-5 = 1.0 \times 0.75 \times 0.062$  in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.



### **ON Semiconductor®**

#### http://onsemi.com





SOT-23 (TO-236) CASE 318 STYLE 6

### MARKING DIAGRAM



B2 = Device Code

M = Date Code\*

= Pb–Free Package

(Note: Microdot may be in either location) \*Date Code orientation and/or overbar may vary depending upon manufacturing location.

#### **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
BSV52LT1	SOT-23	3,000 / Tape & Reel
BSV52LT1G	SOT-23 (Pb-Free)	3,000 / 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.

## BSV52LT1

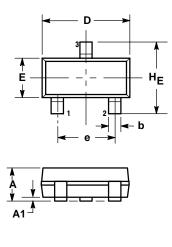
## **ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted)

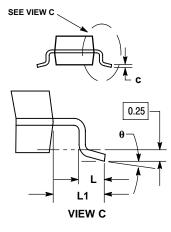
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage $(I_C = 1.0 \text{ mAdc})$	V <sub>(BR)CEO</sub>	12	_	Vdc
Collector Cutoff Current $(V_{CB} = 10 \text{ Vdc}, I_E = 0)$ $(V_{CB} = 10 \text{ Vdc}, I_E = 0, T_A = 125^{\circ}\text{C})$	Ісво		100 5.0	nAdc μAdc
ON CHARACTERISTICS	·			
DC Current Gain $(I_C = 1.0 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc})$ $(I_C = 10 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc})$ $(I_C = 50 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc})$	H <sub>FE</sub>	25 40 25	_ 120 _	-
Collector – Emitter Saturation Voltage ( $I_C = 10 \text{ mAdc}, I_B = 300 \mu \text{Adc}$ ) ( $I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$ ) ( $I_C = 50 \text{ mAdc}, I_B = 5.0 \text{ mAdc}$ )	V <sub>CE(sat)</sub>	- - -	300 250 400	mVdc
Base – Emitter Saturation Voltage ( $I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$ ) ( $I_C = 50 \text{ mAdc}, I_B = 5.0 \text{ mAdc}$ )	V <sub>BE(sat)</sub>	700 -	850 1200	mVdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain – Bandwidth Product ( $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$ )	f <sub>T</sub>	400	-	MHz
Output Capacitance $(V_{CB} = 5.0 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz})$	C <sub>obo</sub>	_	4.0	pF
Input Capacitance $(V_{EB} = 1.0 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz})$	C <sub>ibo</sub>	_	4.5	pF
SWITCHING CHARACTERISTICS				
Storage Time ( $I_C = I_{B1} = I_{B2} = 10 \text{ mAdc}$ )	t <sub>s</sub>	_	13	ns
Turn–On Time ( $V_{BE}$ = 1.5 Vdc, I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 3.0 mAdc)	t <sub>on</sub>	_	12	ns
Turn–Off Time ( $I_C = 10 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$ )	t <sub>off</sub>	_	18	ns

### BSV52LT1

#### PACKAGE DIMENSIONS

SOT-23 (TO-236) CASE 318-08 **ISSUE AN** 





NOTES

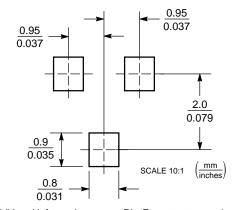
- DIMENSIONING AND TOLERANCING PER ANSI 1. Y14.5M, 1982. CONTROLLING DIMENSION: INCH
- 2. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF 3.
- BASE MATERIAL. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08. 4

	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
С	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
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

STYLE 6:

PIN 1. BASE 2. EMITTER 3. COLLECTOR

**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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