NSVS1002SH

Product Preview

Bipolar Transistor

100 V, 3 A, Low $V_{CE(sat)}$ NPN Single SOT−89

This device is a bipolar junction transistor featuring high current, low saturation voltage, and high speed switching.

Suitable for automotive applications. AEC−Q101 qualified and PPAP capable.

Features

- Complement to NSVS1001SH
- Large Current Capacitance
- Low Collector−to−Emitter Saturation Voltage
- High−Speed Switching
- High Allowable Power Dissipation
- AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- Load Switch
- Gate Driver Buffer
- DC−DC Converters

ABSOLUTE MAXIMUM RATING at T_A = 25°C

Parameter	Symbol	Value	Unit
Collector−to−Base Voltage	V_{CBO}	120	V
Collector−to−Emitter Voltage	V_{CEO}	100	V
Emitter−to−Base Voltage	V_{EBO}	7	V
Collector Current	I_C	3	A
Collector Current (Pulse)	I_{CP}	5	A
Collector Dissipation	P_C	0.5	W
Collector Dissipation (Note 1)	P_C	1.5	W
Collector Dissipation (T_C = 25°C)	P_C	3.5	W
Junction Temperature	T_J	175	°C
Storage Temperature	T_{stg}	−55 to +175	°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.

1. Surface mounted on ceramic board (250 mm^2 x 0.8 mm).

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

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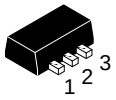
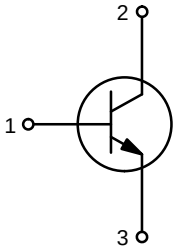
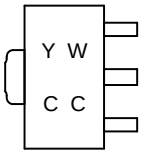


SOT−89
CASE 528AG

ELECTRICAL CONNECTION



MARKING DIAGRAM



Y = Year
W = Work Week
CC = Specific Device Code

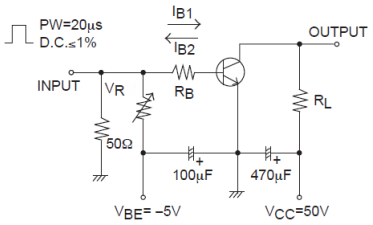
ORDERING INFORMATION

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

ELECTRICAL CHARACTERISTICS at T_A = 25°C

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	VCB = 120 V IE = 0 A			0.1	μA
Emitter Cutoff Current	I_{EBO}	VEB = 7 V IC = 0 A			0.1	μA
DC Current Gain	h_{FE1}	VCE = 5 V IC = 100 mA	300		600	
	h_{FE2}	VCE = 5 V IC = 1.5 A	200			
Gain−Bandwidth Product	f_T	VCE = 10 V IC = 500 mA		TBD		MHz
Output Capacitance	C_{ob}	VCB = 10 V f = 1 MHz		15		pF
Collector−to−Emitter Saturation Voltage	$V_{CE(sat)1}$	IC = 100 mA IB = 10 mA		0.018	0.036	V
	$V_{CE(sat)2}$	IC = 1 A IB = 100 mA		0.06	0.09	V
	$V_{CE(sat)3}$	IC = 3 A IB = 300 mA		0.18	0.36	V
Base−to−Emitter Saturation Voltage	$V_{BE(sat)}$	IC = 1 A IB = 100 mA		0.8	1.2	V
Collector−to−Base Breakdown Voltage	$V_{(BR)CBO}$	IC = 10 μA, IE = 0 A	120			V
Collector−to−Emitter Breakdown Voltage	$V_{(BR)CEO}$	IC = 1 mA, RBE = ∞	100			V
Emitter−to−Base Breakdown Voltage	$V_{(BR)EBO}$	IE = 10 μA, IC = 0 A	7			V
Turn−On Time	t_{on}	See Figure 1		TBD		ns
Storage Time	t_{stg}			TBD		ns
Fall Time	t_f			TBD		ns

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.



IC = 10IB1 = −10IB2 = 1 A

Figure 1. Switching Time Test Circuit

ESD RATING

Parameter	Symbol	Value	Unit	Class
Electrostatic Discharge − Human Body Model	HBM	4000	V	H3
Electrostatic Discharge − Machine Model	MM	400	V	M4

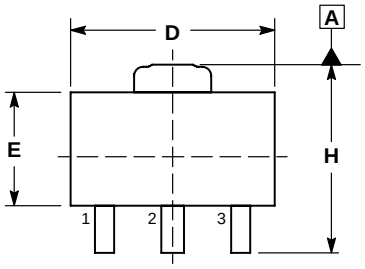
ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)†
NSVS1002SHT1G	CC	SOT−89 (Pb−Free / Halogen Free)	1,000 / Tape & Reel

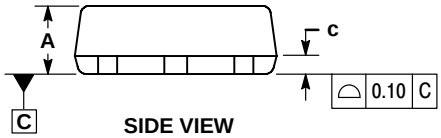
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D

PACKAGE DIMENSIONS

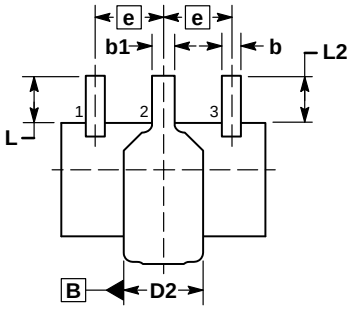
SOT−89, 3 LEAD
CASE 528AG
ISSUE O



TOP VIEW



SIDE VIEW

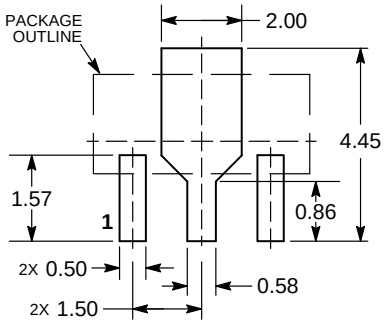


BOTTOM VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS INCLUDES LEAD FINISH.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
5. DIMENSIONS L, L2, D2, AND H ARE MEASURED AT DATUM PLANE C.
6. CENTER LEAD CONTOUR MAY VARY WITHIN THE REGION DEFINED BY DIMENSION E.
7. DIMENSION D2 IS DEFINED AT ITS WIDEST POINT.

	MILLIMETERS	
DIM	MIN	MAX
A	1.40	1.60
b	0.38	0.47
b1	0.46	0.55
c	0.40	0.44
D	4.40	4.60
D2	1.60	1.90
E	2.40	2.60
e	1.50 BSC	
H	4.05	4.25
L	0.89	1.20

RECOMMENDED MOUNTING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
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