

NSVS1001SH

Product Preview

Bipolar Transistor

-100 V, -3 A, Low $V_{CE(sat)}$ PNP 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 NSVS1002SH
- 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 $T_A = 25^\circ\text{C}$

| 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 ($T_C = 25^\circ\text{C}$) | P_C | 3.5 | W |
| Junction Temperature | T_J | 175 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +175 | $^\circ\text{C}$ |

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.

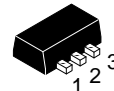
1. Surface mounted on ceramic board (250 mm² x 0.8 mm).

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



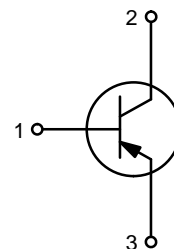
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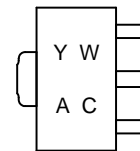


SOT-89
CASE 528AG

ELECTRICAL CONNECTION



MARKING DIAGRAM



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

ORDERING INFORMATION

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

NSVS1001SH

ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Value | | | Unit |
|---|----------------|---|-------|--------|--------|---------------|
| | | | Min | Typ | Max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB} = -120\text{ V}$ $I_E = 0\text{ A}$ | | | -0.1 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = -7\text{ V}$ $I_C = 0\text{ A}$ | | | -0.1 | μA |
| DC Current Gain | h_{FE1} | $V_{CE} = -5\text{ V}$ $I_C = -100\text{ mA}$ | 200 | | 400 | |
| | h_{FE2} | $V_{CE} = -5\text{ V}$ $I_C = -1.5\text{ A}$ | 150 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE} = -10\text{ V}$ $I_C = -500\text{ mA}$ | | 300 | | MHz |
| Output Capacitance | C_{ob} | $V_{CB} = -10\text{ V}$ $f = 1\text{ MHz}$ | | 26 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)1}$ | $I_C = -100\text{ mA}$ $I_B = -10\text{ mA}$ | | -0.025 | -0.05 | V |
| | $V_{CE(sat)2}$ | $I_C = -1\text{ A}$ $I_B = -100\text{ mA}$ | | -0.07 | -0.105 | V |
| | $V_{CE(sat)3}$ | $I_C = -3\text{ A}$ $I_B = -300\text{ mA}$ | | -0.25 | -0.5 | V |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = -1\text{ A}$ $I_B = -100\text{ mA}$ | | -0.8 | -1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = -10\text{ }\mu\text{A}$, $I_E = 0\text{ A}$ | -120 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = -1\text{ mA}$, $R_{BE} = \infty$ | -100 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = -10\text{ }\mu\text{A}$, $I_C = 0\text{ A}$ | -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.

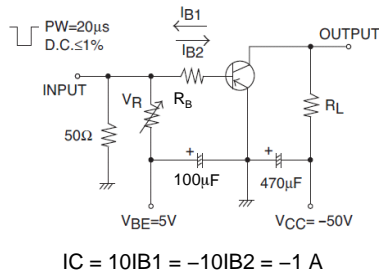


Figure 1. Switching Time Test Circuit

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

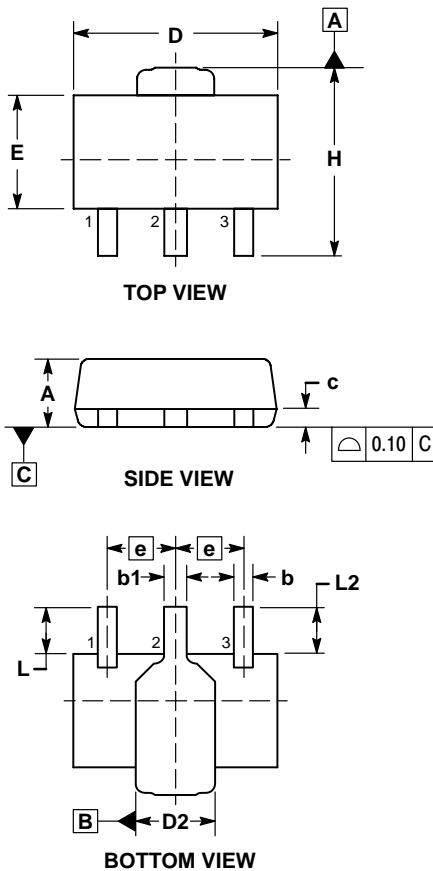
| Device | Marking | Package | Shipping (Qty / Packing) [†] |
|---------------|---------|------------------------------------|---------------------------------------|
| NSVS1001SHT1G | AC | SOT-89 (Pb-Free / Halogen Free) | 1,000 / Tape & Reel |

[†]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

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PACKAGE DIMENSIONS

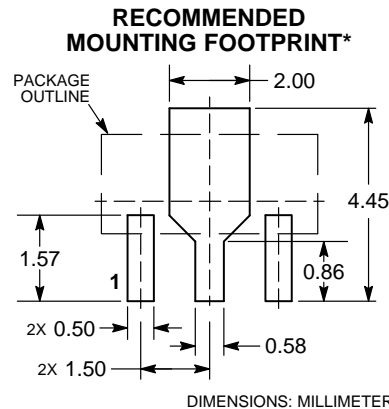
SOT-89, 3 LEAD CASE 528AG ISSUE O



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.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | 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 |



*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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