30 V, 2 A, Low $V_{CE(sat)}$ PNP Transistor

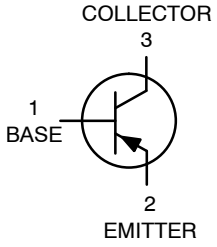
NSS30100L

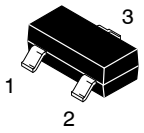
onsemi's e²PowerEdge family of low $V_{CE(sat)}$ transistors are miniature surface mount devices featuring ultra low saturation voltage ($V_{CE(sat)}$) and high current gain capability. These are designed for use in low voltage, high speed switching applications where affordable efficient energy control is important.

Typical application are DC-DC converters and power management in portable and battery powered products such as cellular and cordless phones, PDAs, computers, printers, digital cameras and MP3 players. Other applications are low voltage motor controls in mass storage products such as disc drives and tape drives. In the automotive industry they can be used in air bag deployment and in the instrument cluster. The high current gain allows e²PowerEdge devices to be driven directly from PMU's control outputs, and the Linear Gain (Beta) makes them ideal components in analog amplifiers.

- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

30 VOLTS
2.0 AMPS
PNP LOW $V_{CE(sat)}$ TRANSISTOR
EQUIVALENT $R_{DS(on)}$ 200 mΩ





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

MAXIMUM RATINGS (T_A = 25 °C)

Symbol	Rating	Max	Unit
V_{CEO}	Collector-Emitter Voltage	−30	Vdc
V_{CBO}	Collector-Base Voltage	−50	Vdc
V_{EBO}	Emitter-Base Voltage	−5.0	Vdc
I_C	Collector Current - Continuous	−1.0	A
I_{CM}	Collector Current - Peak	−2.0	A

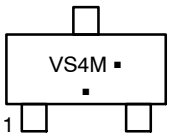
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Symbol	Characteristic	Max	Unit
P_D (Note 1)	Total Device Dissipation T_A = 25 °C Derate above 25 °C	310 2.5	mW mW/°C
$R_{\theta JA}$ (Note 1)	Thermal Resistance, Junction-to-Ambient	403	°C/W
P_D (Note 2)	Total Device Dissipation T_A = 25 °C Derate above 25 °C	710 5.7	mW mW/°C
$R_{\theta JA}$ (Note 2)	Thermal Resistance, Junction-to-Ambient	176	°C/W
$P_{Dsingle}$ (Note 3)	Total Device Dissipation (Single Pulse < 10 sec.)	575	mW
T_J, T_{stg}	Junction and Storage Temperature Range	−55 to +150	°C

1. FR−4 @ Minimum Pad.
2. FR−4 @ 1.0 X 1.0 inch Pad.
3. Refer to Figure 8.

MARKING DIAGRAM



VS4 = Specific 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†
NSS30100LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel

DISCONTINUED (Note 1)

NSV30100LT1G	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 Specification Brochure, BRD8011/D.

1. **DISCONTINUED:** This device is not available. Please contact your **onsemi** representative for information. The most current information on this device may be available on www.onsemi.com.

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Symbol	Characteristic	Min	Max	Unit
OFF CHARACTERISTICS				
$V_{(BR)CEO}$	Collector - Emitter Breakdown Voltage (I_C = −10 mAdc, I_B = 0)	−30	–	Vdc
$V_{(BR)CBO}$	Collector - Base Breakdown Voltage (I_C = −0.1 mAdc, I_E = 0)	−50	–	Vdc
$V_{(BR)EBO}$	Emitter - Base Breakdown Voltage (I_E = −0.1 mAdc, I_C = 0)	−5.0	–	Vdc
I_{CBO}	Collector Cutoff Current v(V_{CB} = −30 Vdc, I_E = 0)	–	−0.1	μAdc
I_{CES}	Collector-Emitter Cutoff Current (V_{CES} = −30 Vdc)	–	−0.1	μAdc
I_{EBO}	Emitter Cutoff Current (V_{EB} = −4.0 Vdc)	–	−0.1	μAdc
ON CHARACTERISTICS				
h_{FE}	DC Current Gain (Note 4) (Figure 1) (I_C = −1.0 mA, V_{CE} = −2.0 V) (I_C = −500 mA, V_{CE} = −2.0 V) (I_C = −1.0 A, V_{CE} = −2.0 V) (I_C = 2.0 A, V_{CE} = −2.0 V)	 100 100 80 40	 – 300 – –	
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage (Note 4) (Figure 3) (I_C = −0.5 A, I_B = −0.05 A) (I_C = −1.0 A, I_B = 0.1 A) (I_C = −2.0 A, I_B = −0.2 A)	 – – –	 −0.25 −0.30 −0.65	V
$V_{BE(sat)}$	Base - Emitter Saturation Voltage (Note 4) (Figure 2) (I_C = −1.0 A, I_B = −0.1 A)	–	−1.2	V
$V_{BE(on)}$	Base - Emitter Turn-on Voltage (Note 4) (I_C = −1.0 A, V_{CE} = −2.0 V)	–	−1.1	V
f_T	Cutoff Frequency (I_C = −100 mA, V_{CE} = −5.0 V, f = 100 MHz)	100	–	MHz
Cobo	Output Capacitance (f = 1.0 MHz)	–	15	pF

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. Pulsed Condition: Pulse Width = 300 msec, Duty Cycle ≤ 2%.

TYPICAL CHARACTERISTICS

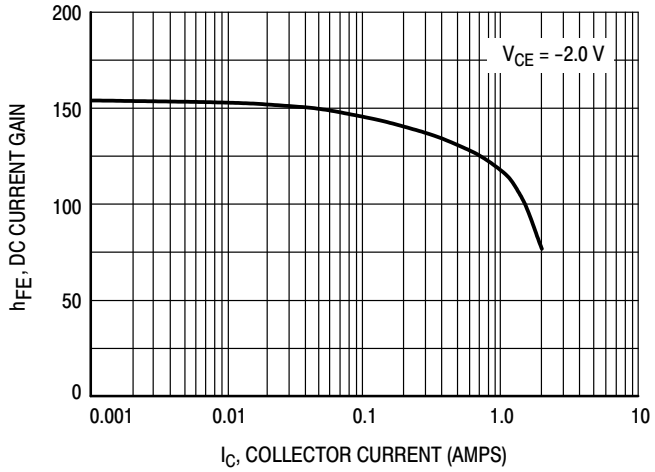


Figure 1. DC Current Gain versus Collector Current

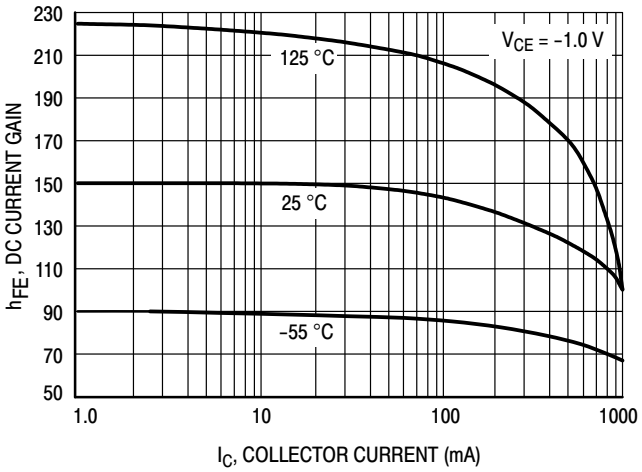


Figure 2. DC Current Gain versus Collector Current

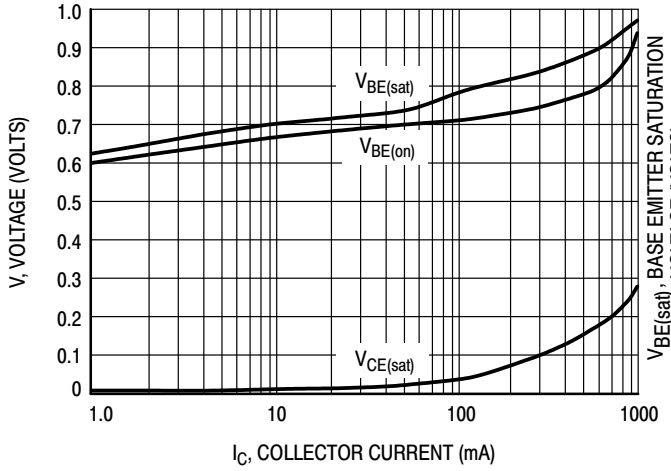


Figure 3. “On” Voltages

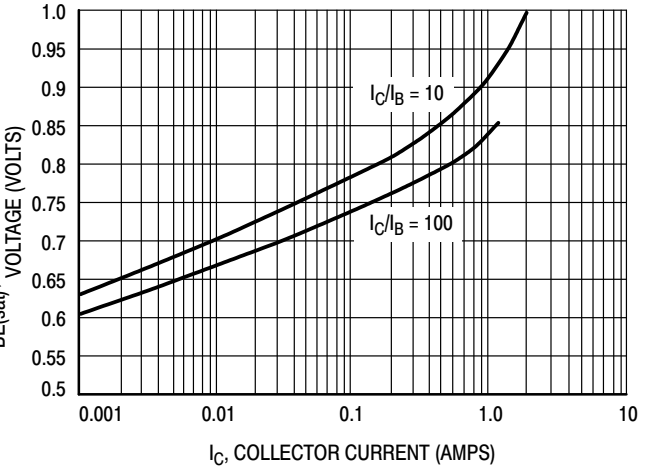


Figure 4. Base Emitter Saturation Voltage versus Collector Current

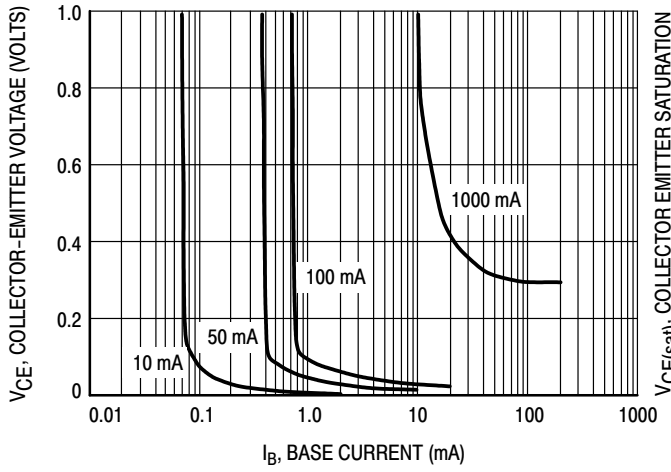


Figure 5. Collector Emitter Saturation Voltage versus Base Current

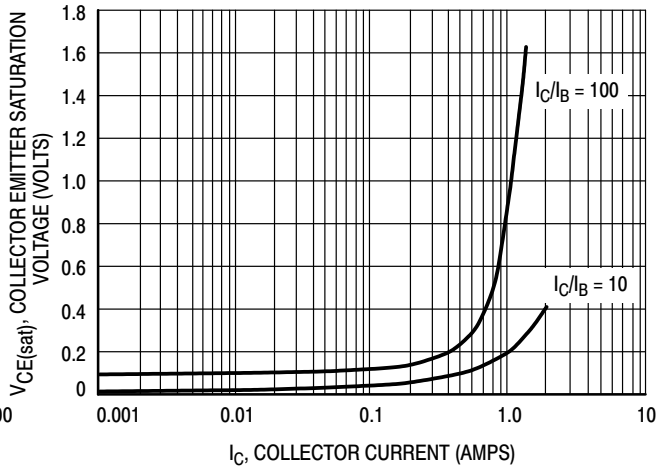


Figure 6. Collector Emitter Saturation Voltage versus Collector Current

TYPICAL CHARACTERISTICS (continued)

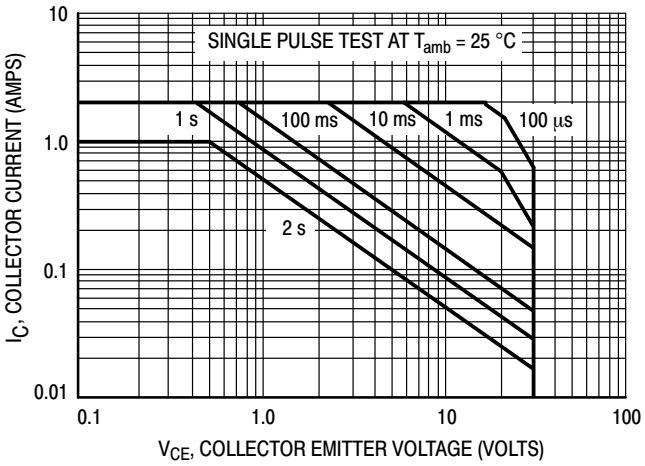


Figure 7. Safe Operating Area

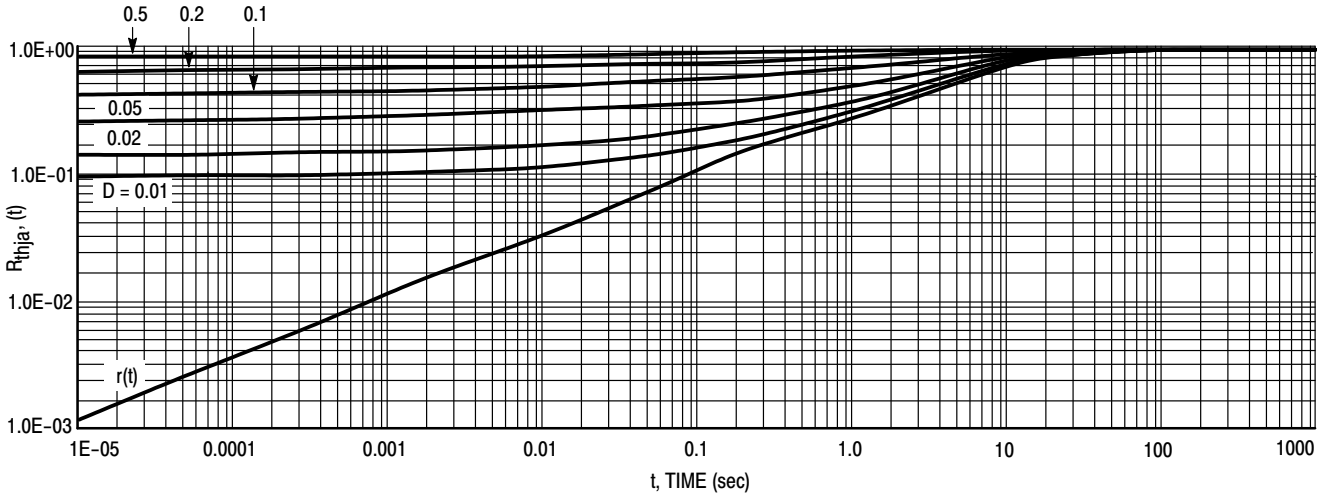
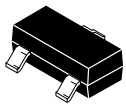


Figure 8. Normalized Thermal Response

REVISION HISTORY

Revision	Description of Changes	Date
6	NSV30100LT1G OPN Marked as Discontinued.	01/14/2026

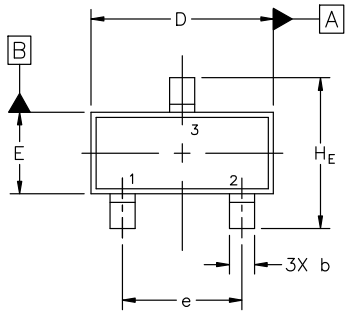
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



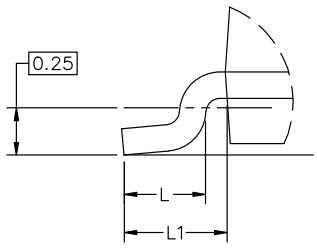
SCALE 4:1

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

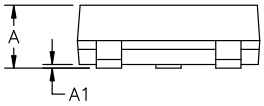
DATE 14 AUG 2024



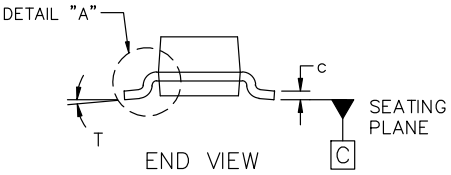
TOP VIEW



DETAIL "A"
Scale 3:1



SIDE VIEW

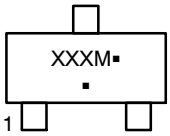


END VIEW

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
H_E	2.10	2.40	2.64
T	0°	−−−	10°

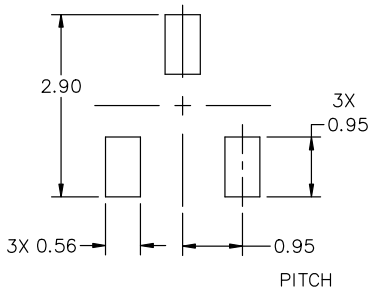
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

GENERIC
MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED
MOUNTING FOOTPRINT

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

STYLES ON PAGE 2

DOCUMENT NUMBER:	**98ASB42226B**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	**SOT−23 (TO−236) 2.90x1.30x1.00 1.90P**		**PAGE 1 OF 2**

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

DATE 14 AUG 2024

STYLE 1 THRU 5:
CANCELLED

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 7:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

STYLE 9:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 11:
PIN 1. ANODE
2. CATHODE
3. CATHODE−ANODE

STYLE 12:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 13:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 14:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 15:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 16:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 17:
PIN 1. NO CONNECTION
2. ANODE
3. CATHODE

STYLE 18:
PIN 1. NO CONNECTION
2. CATHODE
3. ANODE

STYLE 19:
PIN 1. CATHODE
2. ANODE
3. CATHODE−ANODE

STYLE 20:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 22:
PIN 1. RETURN
2. OUTPUT
3. INPUT

STYLE 23:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 24:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 25:
PIN 1. ANODE
2. CATHODE
3. GATE

STYLE 26:
PIN 1. CATHODE
2. ANODE
3. NO CONNECTION

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

STYLE 28:
PIN 1. ANODE
2. ANODE
3. ANODE

ADDITIONAL INFORMATION

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