# NSS12100XV6T1G

# Low V<sub>CE(sat)</sub> Transistor, PNP, 12 V, 1.0 A, SOT-563 Package

ON Semiconductor's e<sup>2</sup>PowerEdge 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 e<sup>2</sup>PowerEdge devices to be driven directly from PMU's control outputs, and the Linear Gain (Beta) makes them ideal components in analog amplifiers.

#### Features

- High Current Capability (1 A)
- High Power Handling (Up to 650 mW)
- Low V<sub>CE(s)</sub> (150 mV Typical @ 500 mA)
- Small Size
- This is a Pb-Free Device

#### Benefits

- High Specific Current and Power Capability Reduces Required PCB Area
- Reduced Parasitic Losses Increases Battery Life

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Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	-12	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	-12	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	Vdc
Collector Current – Continuous – Peak	I <sub>C</sub> I <sub>CM</sub>	-1.0 -2.0	Adc
Electrostatic Discharge	ESD	HBM Cla MM Clas	

#### **MAXIMUM RATINGS** ( $T_A = 25^{\circ}C$ )

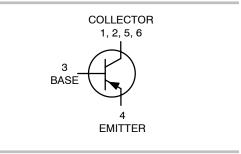
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



### **ON Semiconductor®**

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# $\begin{array}{l} \mbox{12 VOLTS, 1.0 AMPS} \\ \mbox{PNP LOW V}_{CE(sat)} \mbox{TRANSISTOR} \\ \mbox{EQUIVALENT R}_{DS(on)} \mbox{300 m} \Omega \end{array}$





#### **DEVICE MARKING**

	VE M •
	0
1'	

VE = Specific Device Code M = Month Code = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
NSS12100XV6T1G	SOT-563 (Pb-Free)	

+ 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.

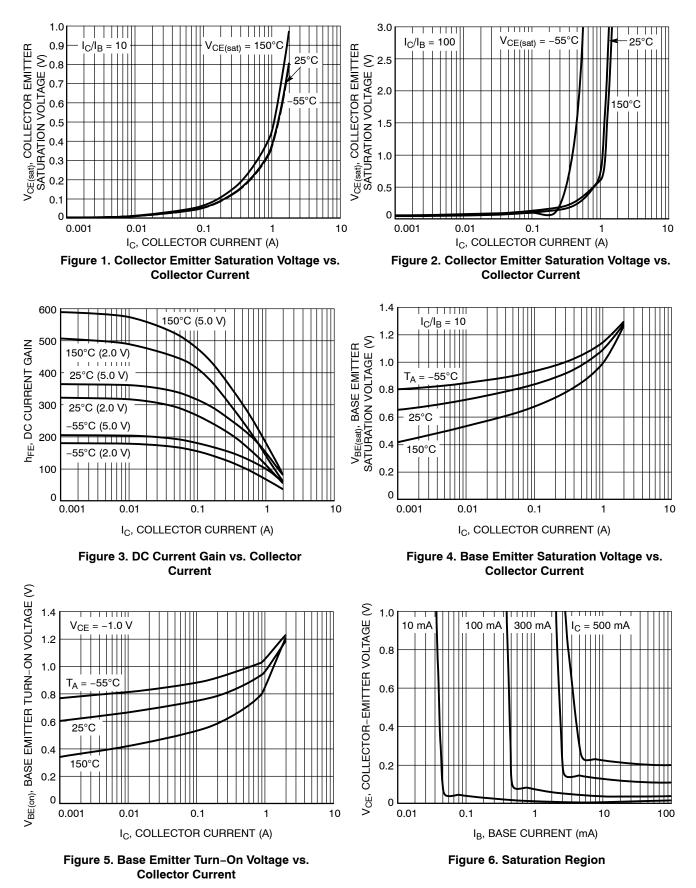
#### **THERMAL CHARACTERISTICS**

Characteristic	Symbol		Max		Unit
Total Device Dissipation $T_A = 25^{\circ}C$	P <sub>D</sub> (Note 1)	500			mW
Derate above 25°C		4.0		mW/°C	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ (Note 1)	250		°C/W	
Total Device Dissipation T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub> (Note 2)	650			mW mW/°C
			5.2		
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub> (Note 2)		192		°C/W
Thermal Resistance, Junction-to-Lead 6	$R_{ ext{ heta}JL}$	105			°C/W
Total Device Dissipation (Single Pulse < 10 sec.)	P <sub>D</sub> Single	1.0		W	
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150		°C	
<b>ELECTRICAL CHARACTERISTICS</b> ( $T_J = 25^{\circ}C$ unless otherwise n	noted)				
Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS			•		
Collector – Emitter Breakdown Voltage, ( $I_C = -10 \text{ mAdc}, I_B = 0$ )	V <sub>(BR)CEO</sub>	-12	-	-	Vdc
Collector – Base Breakdown Voltage, ( $I_C = -0.1 \text{ mAdc}, I_E = 0$ )	V <sub>(BR)CBO</sub>	-12	-	_	Vdc
Emitter – Base Breakdown Voltage, ( $I_E = -0.1 \text{ mAdc}$ , $I_C = 0$ )	V <sub>(BR)EBO</sub>	-5.0	-	_	Vdc
Collector Cutoff Current, ( $V_{CB} = -12$ Vdc, $I_E = 0$ )	I <sub>CBO</sub>	-	-0.02	-0.1	μAdc
Emitter Cutoff Current, ( $V_{CES} = -5.0$ Vdc, $I_E = 0$ )	I <sub>EBO</sub>	_	-0.03	-0.1	μAdc
ON CHARACTERISTICS					
DC Current Gain (Note 3) ( $I_C = -10 \text{ mA}, V_{CE} = -2.0 \text{ V}$ ) ( $I_C = -500 \text{ mA}, V_{CE} = -2.0 \text{ V}$ ) ( $I_C = -1.0 \text{ A}, V_{CE} = -2.0 \text{ V}$ )	h <sub>FE</sub>	200 100 90			
Collector Emitter Saturation Voltage (Note 3)	Veru				V

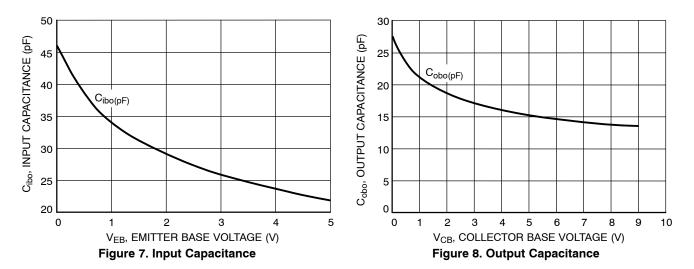
(I <sub>C</sub> = -1.0 A, V <sub>CE</sub> = -2.0 V)		90	-	-	
	V <sub>CE(sat)</sub>	- - - -	-0.030 -0.080 -0.050 -0.200 -0.400	-0.040 -0.100 -0.060 -0.225 -0.440	V
Base – Emitter Saturation Voltage (Note 3) ( $I_{C} = -1.0 \text{ A}, I_{B} = -0.01 \text{ A}$ )	V <sub>BE(sat)</sub>	-	0.95	-1.15	V
Base – Emitter Turn–on Voltage (Note 3) ( $I_C = -2.0 \text{ A}, V_{CE} = -3.0 \text{ V}$ )	V <sub>BE(on)</sub>	-	-1.05	-1.15	V
Input Capacitance ( $V_{EB} = -0.5 \text{ V}$ , f = 1.0 MHz)	Cibo	-		50	pF
Output Capacitance (V <sub>CB</sub> = -3.0 V, f = 1.0 MHz)	Cobo	-		20	pF

1. FR-4 @ 100 mm<sup>2</sup>, 1 oz copper traces. 2. FR-4 @ 500 mm<sup>2</sup>, 1 oz copper traces. 3. Pulsed Condition: Pulse Width = 300  $\mu$ sec, Duty Cycle  $\leq$  2%. 4. Guaranteed by design but not tested.

## NSS12100XV6T1G



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MILLIMETERS

NDM.

0.55

0.22

0.13

1.60

1.20

0.50 BSC

0.20

1.60

MAX.

0.60

0.27

0.18

1.70

1.30

0.30

1.70

SIDE VIEW

MIN.

0.50

0.17

0.08

1.50

1.10

0.10

1.50

DIM

Α

b

С

D E

e L

 $\mathsf{H}_\mathsf{E}$ 



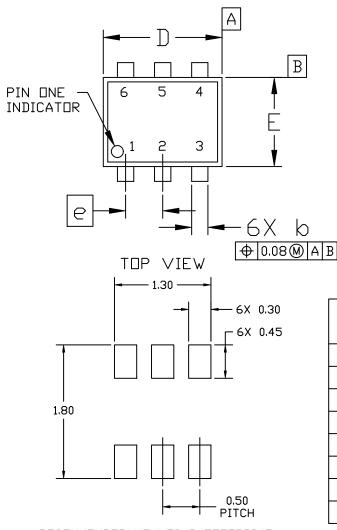


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DATE 26 JAN 2021

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- NDTES: 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
- 1. DIMENSIONING AND TOLERANCING PER A 2. CONTROLLING DIMENSION: MILLIMETERS
- 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS DF BASE MATERIAL.



RECOMMENDED MOUNTING FOOTPRINT\* \* For additional information on our Pb-Free strategy and soldering details, please download the DN Semiconductor Soldering and Mounting Techniques Reference Manual, SDLDERRM/D.

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STYLE 1:	STYLE 2:	STYLE 3:
PIN 1. EMITTER 1	PIN 1. EMITTER 1	PIN 1. CATHIDE 1
2. BASE 1	2. EMITTER 2	2. CATHIDE 1
3. COLLECTOR 2	3. BASE 2	3. ANUDE/ANUDE 2
4. EMITTER 2	4. COLLECTOR 2	4. CATHIDE 2
5. BASE 2	5. BASE 1	5. CATHIDE 2
6. COLLECTOR 1	6. COLLECTOR 1	6. ANUDE/ANUDE 1
STYLE 4:	STYLE 5:	STYLE 6:
PIN 1. COLLECTOR	PIN 1. CATHEDE	PIN 1. CATHODE
2. COLLECTOR	2. CATHEDE	2. ANODE
3. BASE	3. ANEDE	3. CATHODE
4. EMITTER	4. ANEDE	4. CATHODE
5. COLLECTOR	5. CATHEDE	5. CATHODE
6. COLLECTOR	6. CATHEDE	6. CATHODE
STYLE 7:	STYLE 8:	STYLE 9:
PIN 1. CATHODE	PIN 1. DRAIN	PIN 1. SDURCE 1
2. ANODE	2. DRAIN	2. GATE 1
3. CATHODE	3. GATE	3. DRAIN 2
4. CATHODE	4. SDURCE	4. SDURCE 2
5. ANODE	5. DRAIN	5. GATE 2
6. CATHODE	6. DRAIN	6. DRAIN 1
STYLE 10: PIN 1. CATHODE 1 2. N/C 3. CATHODE 2 4. ANODE 2 5. N/C 6. ANODE 1	STYLE 11: PIN 1. EMITTER 2 2. BASE 2 3. COLLECTOR 1 4. EMITTER 1 5. BASE 1 6. COLLECTOR 2	

6. COLLECTOR 2

DATE 26 JAN 2021

#### GENERIC **MARKING DIAGRAM\***



XX = Specific Device Code

M = Month 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.

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