

12 V, 1 A, Low V_{CE(sat)} PNP Transistor NSS12100M3T5G

onsemi's e^2 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 e²PowerEdge devices to be driven directly from PMU's control outputs, and the Linear Gain (Beta) makes them ideal components in analog amplifiers.

Features

- High Continuous Current Capability (1 A)
- Low V_{CE(sat)} (150 mV Typical @ 500 mA)
- Small Size 1.2 mm x 1.2 mm
- This is a Pb-Free Device

Benefits

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

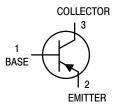
MAXIMUM RATINGS (T_A = 25 °C)

Symbol	Rating	Max	Unit
V _{CEO}	Collector-Emitter Voltage	-12	Vdc
V_{CBO}	Collector-Base Voltage	-12	Vdc
V _{EBO}	V _{EBO} Emitter-Base Voltage		Vdc
I _C I _{CM}	Collector Current - Continuous - Peak	-1.0 -3.0	Adc
ESD	Electrostatic Discharge	HBM Clas	

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.

12 VOLTS, 1.0 AMPS PNP LOW $V_{CE(sat)}$ TRANSISTOR EQUIVALENT $R_{DS(on)}$ 350 m Ω





MARKING DIAGRAM



VE = Specific Device Code M = Date Code

ORDERING INFORMATION

Device	Package	Shipping [†]
NSS12100M3T5G	SOT-723 (Pb-Free)	8,000/ 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.

THERMAL CHARACTERISTICS

Symbol	Characteristic	Max	Unit
P _D (Note 1)	Total Device Dissipation $T_A = 25 ^{\circ}\text{C}$	460	mW
	Derate above 25 °C	3.7	mW/°C
R _{θJA} (Note 1)	Thermal Resistance, Junction-to-Ambient	270	°C/W
P _D (Note 2)	Total Device Dissipation T _A = 25 °C	625	mW
	Derate above 25 °C	5.0	mW/°C
R _{θJA} (Note 2)	Thermal Resistance, Junction-to-Ambient	200	°C/W
$R_{ hetaJL}$	Thermal Resistance, Junction-to-Lead 3	105	°C/W
T _J , T _{stg}	Junction and Storage Temperature Range	-55 to +150	°C

FLECTRICAL CHARACTERISTICS (T. - 25 °C unless otherwise noted)

Symbol	Characteristic	Min	Тур	Max	Unit
OFF CHARAC	TERISTICS				
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage, (I _C = -10 mAdc, I _B = 0)	-12	_	_	Vdc
V _{(BR)CBO}	Collector-Base Breakdown Voltage, (I _C = -0.1 mAdc, I _E = 0)	-12	-	-	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 _{CB} = -12 Vdc, I _E = 0)	-	-0.01	-0.1	μAdc
I _{EBO}	Emitter Cutoff Current, (V _{CES} = -5.0 Vdc, I _E = 0)	-	-0.01	-0.1	μAdc
ON CHARACT	TERISTICS				
h _{FE}	DC Current Gain (Note 3) ($I_C = -10 \text{ mA}, V_{CE} = -2.0 \text{ V}$) ($I_C = -500 \text{ mA}, V_{CE} = -2.0 \text{ V}$) ($I_C = -1.0 \text{ A}, V_{CE} = -2.0 \text{ V}$)	200 120 80	- - -	- - -	
V _{CE} (sat)	Collector - Emitter Saturation Voltage (Note 3) $ \begin{pmatrix} I_C = -0.05 \text{ A}, I_B = -0.005 \text{ A} \end{pmatrix} \text{ (Note 4)} \\ \begin{pmatrix} I_C = -0.1 \text{ A}, I_B = -0.002 \text{ A} \end{pmatrix} \\ \begin{pmatrix} I_C = -0.1 \text{ A}, I_B = -0.010 \text{ A} \end{pmatrix} \\ \begin{pmatrix} I_C = -0.5 \text{ A}, I_B = -0.050 \text{ A} \end{pmatrix} \\ \begin{pmatrix} I_C = -1.0 \text{ A}, I_B = -0.100 \text{ A} \end{pmatrix} $	- - - -	-0.030 -0.060 -0.040 -0.155 -0.350	-0.035 -0.080 -0.060 -0.220 -0.410	V
V _{BE(sat)}	Base-Emitter Saturation Voltage (Note 3) $(I_C = -1.0 \text{ A}, I_B = -0.01 \text{ A})$	-	0.95	-1.15	V
V _{BE(on)}	Base - Emitter Turn-on Voltage (Note 3) (I _C = -2.0 A, V _{CE} = -2.0 V)	-	-1.05	-1.15	V
SMALL-SIGN	AL CHARACTERISTICS				
Cibo	Input Capacitance (V _{EB} = -0.5 V, f = 1.0 MHz)	-	40	50	pF
Cobo	Output Capacitance (V _{CB} = -3.0 V, f = 1.0 MHz)	-	15	20	pF
NF	Noise Figure ($I_C = 0.2 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $R_S = 1.0 \text{ k}\Omega$, $f = 1.0 \text{ MHz}$, $BW = 200 \text{ Hz}$)	_	_	5.0	dB

FR-4 @ 100 mm², 1 oz copper traces.
 FR-4 @ 500 mm², 1 oz copper traces.
 Pulsed Condition: Pulse Width = 300 μsec, Duty Cycle ≤ 2%.

^{4.} Guaranteed by design but not tested.

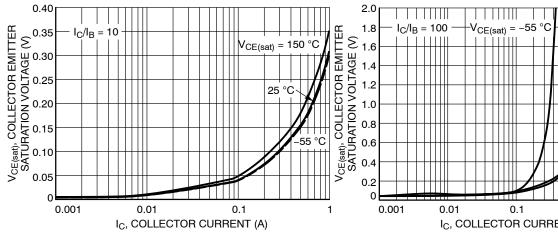
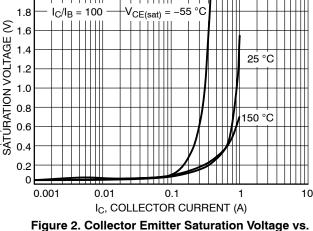


Figure 1. Collector Emitter Saturation Voltage vs. **Collector Current**



Collector Current

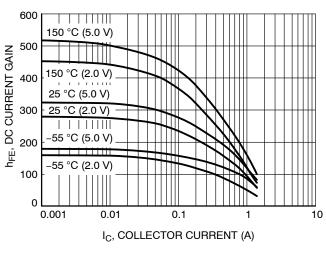


Figure 3. DC Current Gain vs. Collector Current

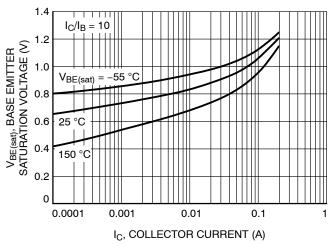


Figure 4. Base Emitter Saturation Voltage vs. **Collector Current**

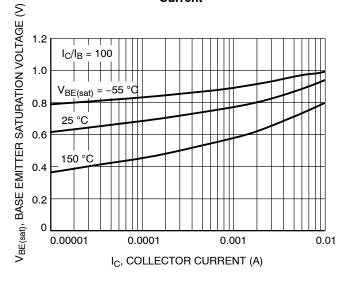


Figure 5. Base Emitter Saturation Voltage vs. **Collector Current**

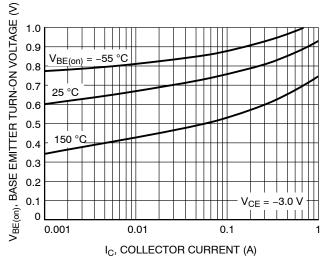
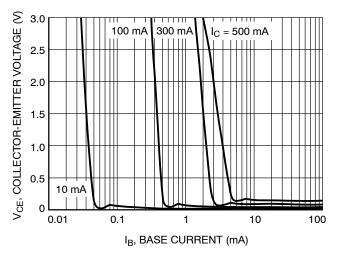


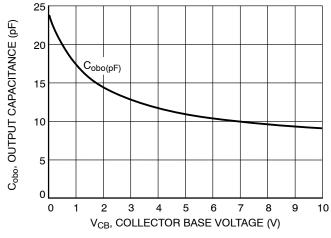
Figure 6. Base Emitter Turn-On Voltage vs. **Collector Current**



C_{ibo}, INPUT CAPACITANCE (pF) C_{ibo(pF)} V_{EB}, EMITTER BASE VOLTAGE (V)

Figure 7. Saturation Region @ 25 °C

Figure 8. Input Capacitance



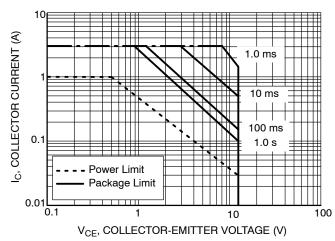


Figure 9. Output Capacitance

Figure 10. Safe Operating Area

REVISION HISTORY

Revision	Description of Changes	Date
1	Rebranded the Data Sheet to onsemi format.	10/14/2025

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.





SOT-723 1.20x0.80x0.50, 0.40P CASE 631AA ISSUE E

DATE 24 JAN 2024

MAX.

0.55

0.27

0.37

0.17

1.25

0.85

1.25

0.25

MILLIMETERS

 $N\square M$.

0.50

0.21

0.31

0.12

1.20

0.80

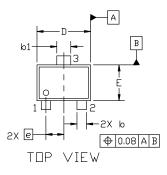
0.40 BSC

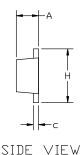
1.20

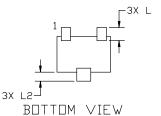
0.29 REF

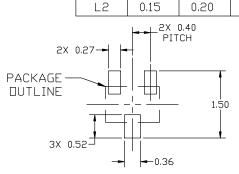
NOTES:

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









DIM

Α

b

b1

c D

Ε

e H

L

MIN.

0.45

0.15

0.25

0.07

1.15

0.75

1.15

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.

GENERIC MARKING DIAGRAM*



XX = Specific Device Code M = Date Code

*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.

STYLE 1:	STYLE 2:	STYLE 3:	STYLE 4:	STYLE 5:
PIN 1. BASE	PIN 1. ANODE	PIN 1. ANODE	PIN 1. CATHODE	PIN 1. GATE
2. EMITTER	2. N/C	2. ANODE	CATHODE	SOURCE
COLLECTOR	CATHODE	CATHODE	ANODE	DRAIN

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DESCRIPTION:	SOT-723 1.20x0.80x0.50, 0.40P		PAGE 1 OF 1

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