

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

NSS12100M3T5G

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.

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

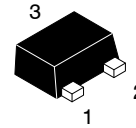
- High Specific Current and Power Capability Reduces Required PCB Area
- Reduced Parasitic Losses Increases Battery Life

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

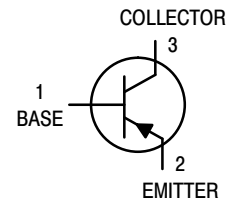
Symbol	Rating	Max	Unit
V_{CEO}	Collector-Emitter Voltage	-12	Vdc
V_{CBO}	Collector-Base Voltage	-12	Vdc
V_{EBO}	Emitter-Base Voltage	-5.0	Vdc
I_C I_{CM}	Collector Current - Continuous - Peak	-1.0 -3.0	Adc
ESD	Electrostatic Discharge	HBM Class 3B MM Class C	

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.

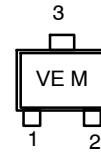
12 VOLTS, 1.0 AMPS PNP LOW $V_{CE(sat)}$ TRANSISTOR EQUIVALENT $R_{DS(on)}$ 350 m Ω



SOT-723
CASE 631AA
STYLE 1



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 °C Derate above 25 °C	460	mW
		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 Derate above 25 °C	625	mW
		5.0	mW/°C
R _{θJA} (Note 2)	Thermal Resistance, Junction-to-Ambient	200	°C/W
R _{θJL}	Thermal Resistance, Junction-to-Lead 3	105	°C/W
T _J , T _{stg}	Junction and Storage Temperature Range	–55 to +150	°C

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

Symbol	Characteristic	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

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 _{CE} = –5.0 Vdc, I _E = 0)	–	–0.01	–0.1	μAdc

ON CHARACTERISTICS

h _{FE}	DC Current Gain (Note 3) (I _C = –10 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)	200 120 80	– – –	– – –	
V _{CE(sat)}	Collector - Emitter Saturation Voltage (Note 3) (I _C = –0.05 A, I _B = –0.005 A) (Note 4) (I _C = –0.1 A, I _B = –0.002 A) (I _C = –0.1 A, I _B = –0.010 A) (I _C = –0.5 A, I _B = –0.050 A) (I _C = –1.0 A, I _B = –0.100 A)	– – – – –	–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 A, I _B = –0.01 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-SIGNAL CHARACTERISTICS

C _{ibo}	Input Capacitance (V _{EB} = –0.5 V, f = 1.0 MHz)	–	40	50	pF
C _{obo}	Output Capacitance (V _{CB} = –3.0 V, f = 1.0 MHz)	–	15	20	pF
NF	Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 1.0 kΩ, f = 1.0 MHz, BW = 200 Hz)	–	–	5.0	dB

1. FR–4 @ 100 mm², 1 oz copper traces.
2. FR–4 @ 500 mm², 1 oz copper traces.
3. Pulsed Condition: Pulse Width = 300 μsec, Duty Cycle ≤ 2%.
4. Guaranteed by design but not tested.



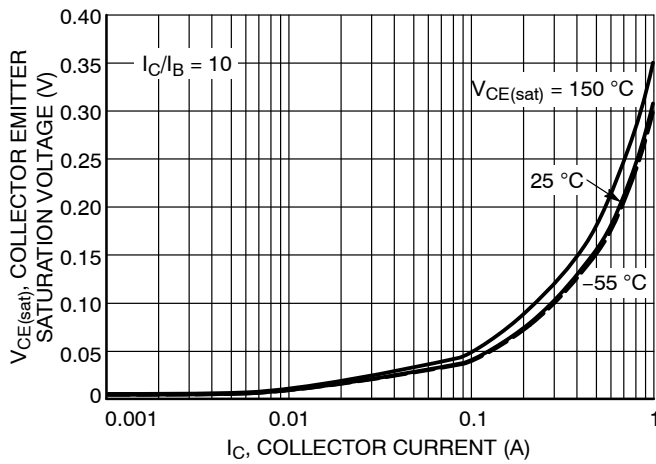


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

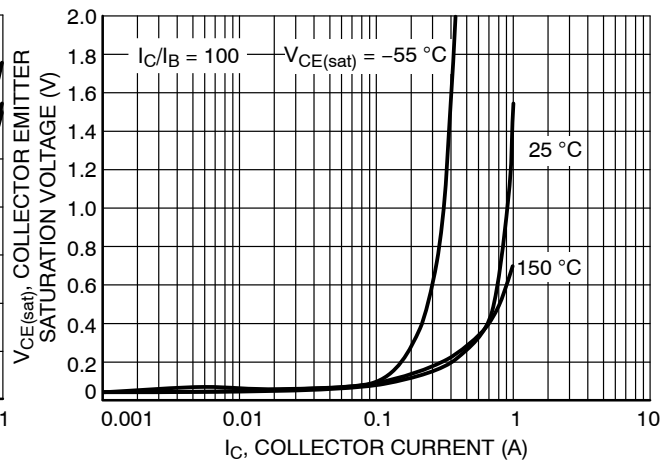


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

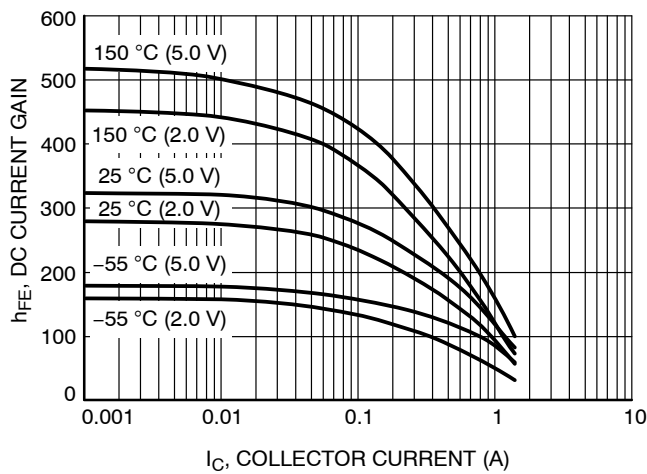


Figure 3. DC Current Gain vs. Collector Current

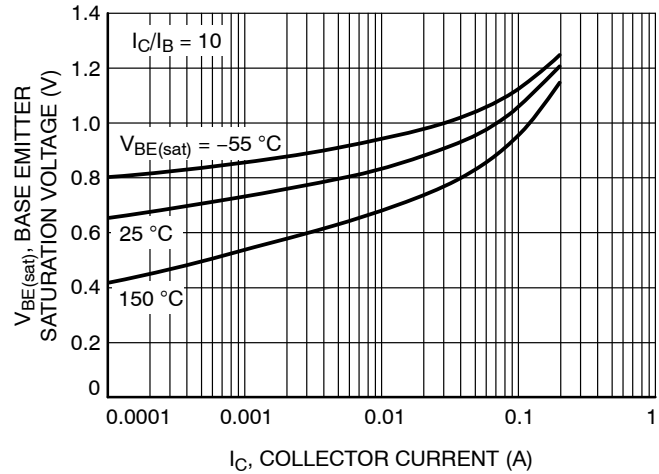


Figure 4. Base Emitter Saturation Voltage vs. Collector Current

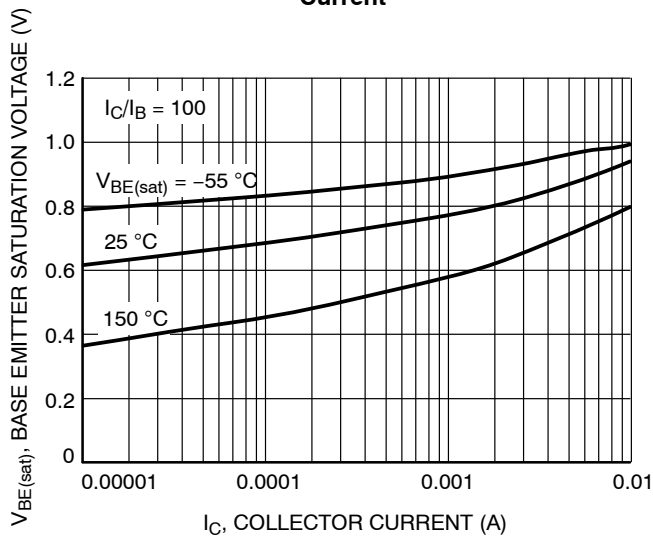


Figure 5. Base Emitter Saturation Voltage vs. Collector Current

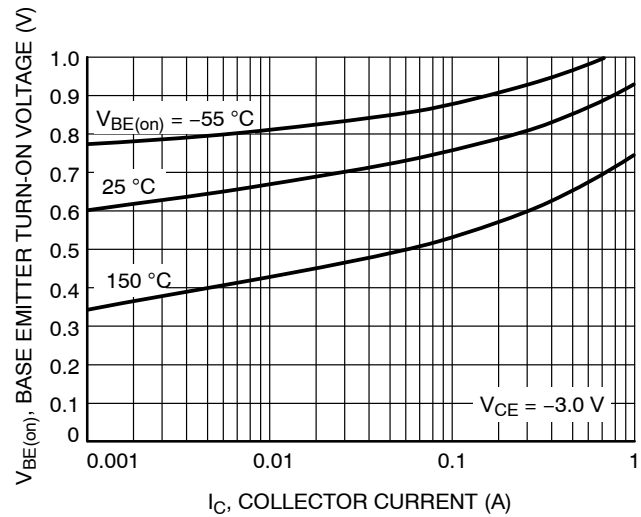


Figure 6. Base Emitter Turn-On Voltage vs. Collector Current

NSS12100M3T5G

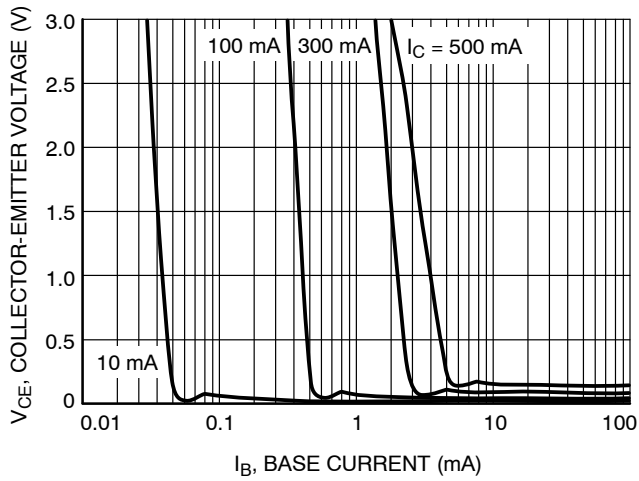


Figure 7. Saturation Region @ 25 °C

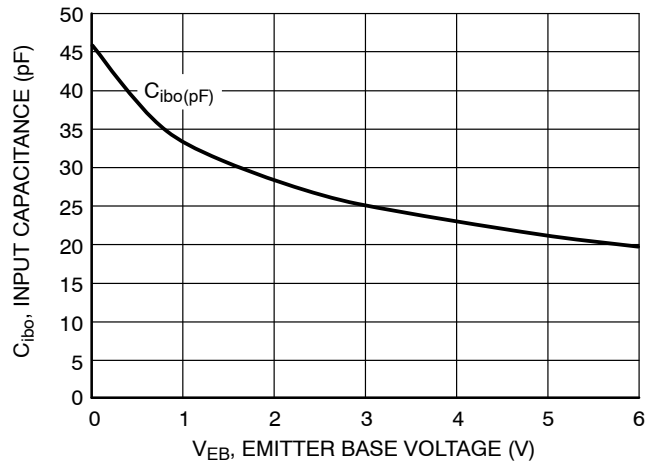


Figure 8. Input Capacitance

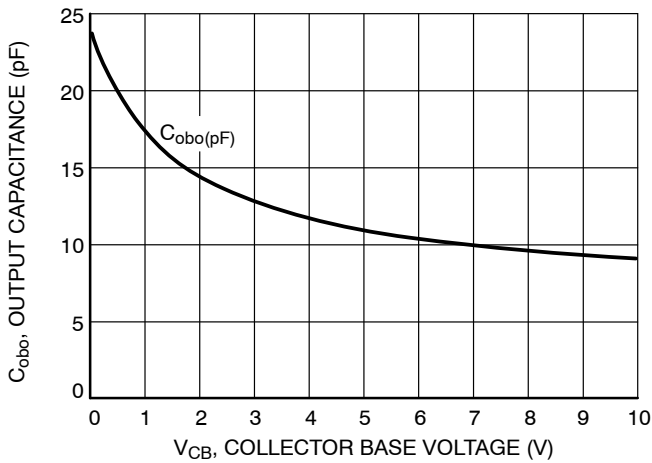


Figure 9. Output Capacitance

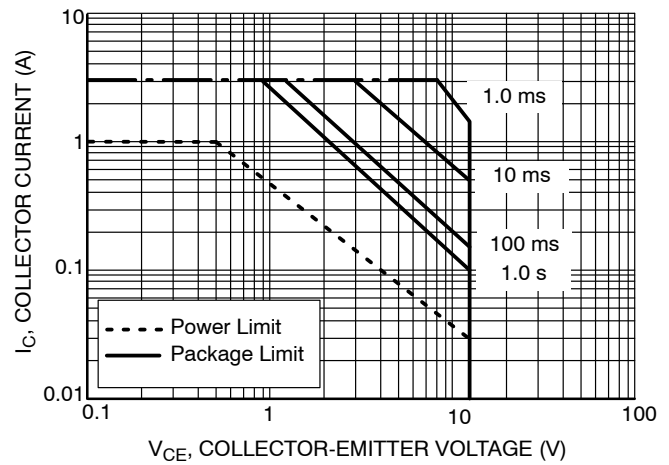


Figure 10. Safe Operating Area

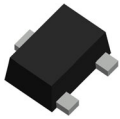
NSS12100M3T5G

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.



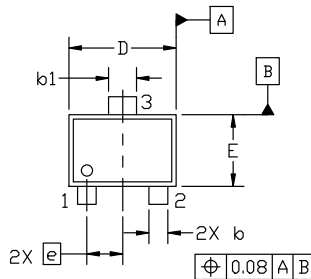


SOT-723 1.20x0.80x0.50, 0.40P
CASE 631AA
ISSUE E

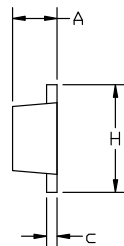
DATE 24 JAN 2024

NOTES:

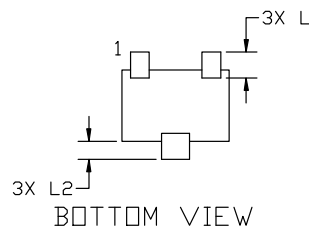
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



TOP VIEW

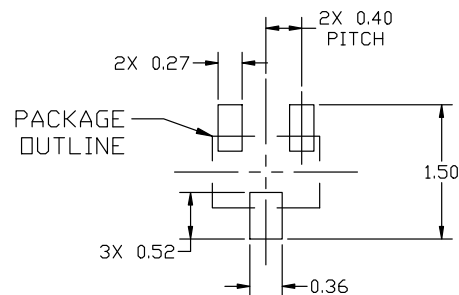


SIDE VIEW



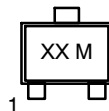
BOTTOM VIEW

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.45	0.50	0.55
b	0.15	0.21	0.27
b1	0.25	0.31	0.37
c	0.07	0.12	0.17
D	1.15	1.20	1.25
E	0.75	0.80	0.85
e	0.40 BSC		
H	1.15	1.20	1.25
L	0.29 REF		
L2	0.15	0.20	0.25



RECOMMENDED MOUNTING
FOOTPRINT

**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.

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

STYLE 1: PIN 1. BASE 2. EMITTER 3. COLLECTOR	STYLE 2: PIN 1. ANODE 2. N/C 3. CATHODE	STYLE 3: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 4: PIN 1. CATHODE 2. CATHODE 3. ANODE	STYLE 5: PIN 1. GATE 2. SOURCE 3. DRAIN
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DESCRIPTION:	SOT-723 1.20x0.80x0.50, 0.40P	PAGE 1 OF 1

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