NSS12100M3T5G

Low $V_{CE(sat)}$, Transistor, PNP, 12 V, 1.0 A, SOT-723 Package

ON Semiconductor'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 e[2]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 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)

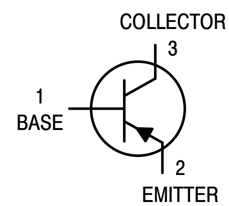
Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V_{CEO}	-12	Vdc
Collector-Base Voltage	V_{CBO}	-12	Vdc
Emitter-Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current - Continuous - Peak	I_C I_{CM}	-1.0 -3.0	Adc
Electrostatic Discharge	ESD	HBM Class 3B MM Class C	

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.

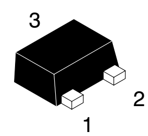
ON Semiconductor®

http://onsemi.com

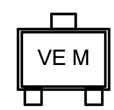
12 VOLTS, 1.0 AMPS
PNP LOW $V_{CE(sat)}$ TRANSISTOR
EQUIVALENT $R_{DS(on)}$ 350 mΩ



MARKING DIAGRAM



SOT-723
CASE 631AA
STYLE 1



VE = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NSS12100M3T5G	SOT-723 (Pb-Free)	8000/ 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.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 1)	460 3.7	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ (Note 1)	270	°C/W
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 2)	625 5.0	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ (Note 2)	200	°C/W
Thermal Resistance, Junction-to-Lead 3	$R_{\theta JL}$	105	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage, (I_C = −10 mAdc, I_B = 0)	$V_{(BR)CEO}$	−12	–	–	Vdc
Collector-Base Breakdown Voltage, (I_C = −0.1 mAdc, I_E = 0)	$V_{(BR)CBO}$	−12	–	–	Vdc
Emitter-Base Breakdown Voltage, (I_E = −0.1 mAdc, I_C = 0)	$V_{(BR)EBO}$	−5.0	–	–	Vdc
Collector Cutoff Current, (V_{CB} = −12 Vdc, I_E = 0)	I_{CBO}	–	−0.01	−0.1	μAdc
Emitter Cutoff Current, (V_{CES} = −5.0 Vdc, I_E = 0)	I_{EBO}	–	−0.01	−0.1	μAdc
ON CHARACTERISTICS					
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)	h_{FE}	 200 120 80	 – – –	 – – –	
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)	$V_{CE(sat)}$	 – – – – –	 −0.030 −0.060 −0.040 −0.155 −0.350	 −0.035 −0.080 −0.060 −0.220 −0.410	V
Base-Emitter Saturation Voltage (Note 3) (I_C = −1.0 A, I_B = −0.01 A)	$V_{BE(sat)}$	 –	 0.95	 −1.15	V
Base-Emitter Turn-on Voltage (Note 3) (I_C = −2.0 A, V_{CE} = −2.0 V)	$V_{BE(on)}$	 –	 −1.05	 −1.15	V
SMALL-SIGNAL CHARACTERISTICS					
Input Capacitance (V_{EB} = −0.5 V, f = 1.0 MHz)	Cibo	–	40	50	pF
Output Capacitance (V_{CB} = −3.0 V, f = 1.0 MHz)	Cobo	–	15	20	pF
Noise Figure (I_C = 0.2 mA, V_{CE} = 5.0 V, R_S = 1.0 kΩ, f = 1.0 MHz, BW = 200 Hz)	NF	–	–	5.0	dB

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

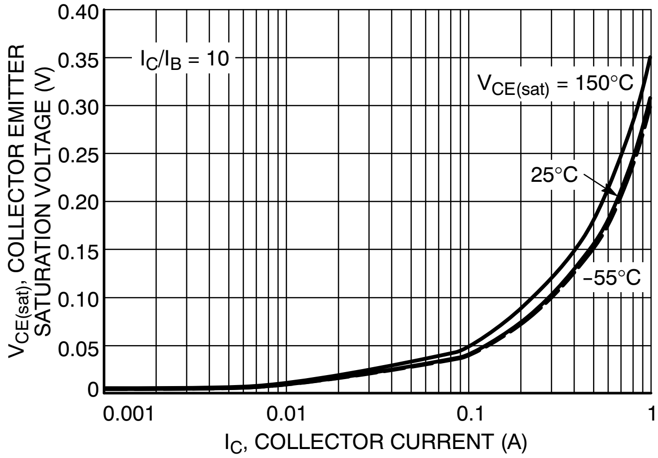


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

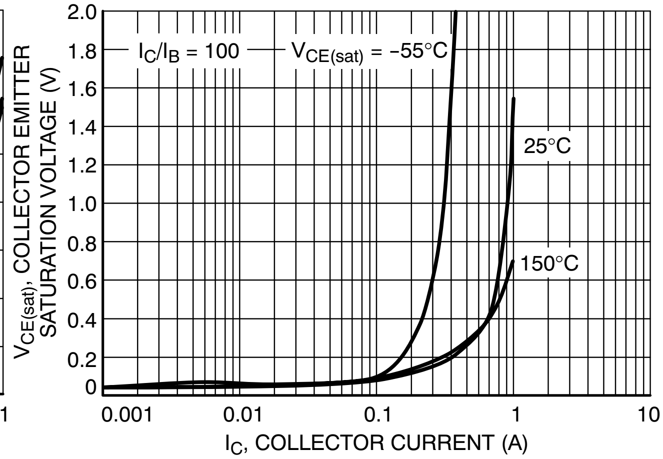


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

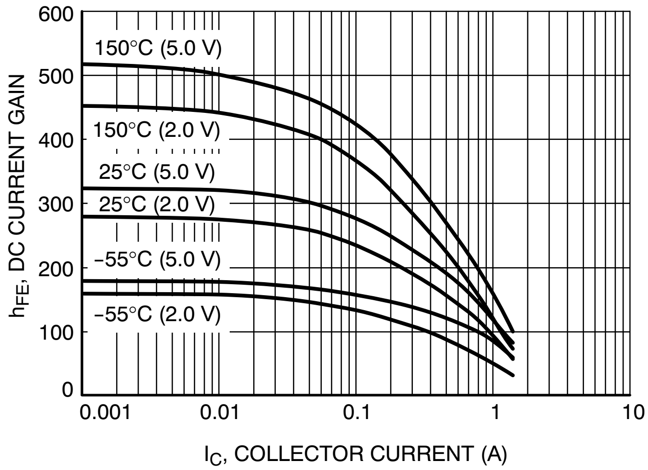


Figure 3. DC Current Gain vs. Collector Current

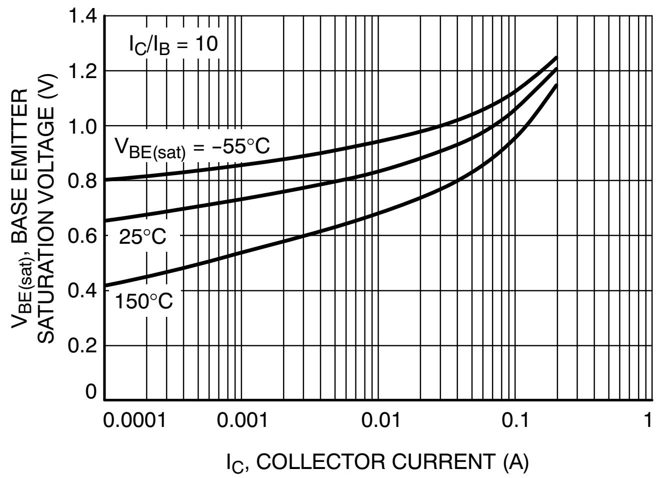


Figure 4. Base Emitter Saturation Voltage vs. Collector Current

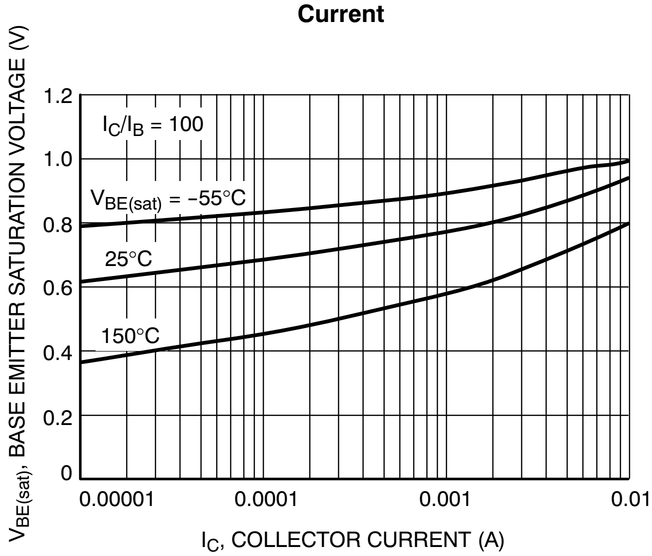


Figure 5. Base Emitter Saturation Voltage vs. Collector Current

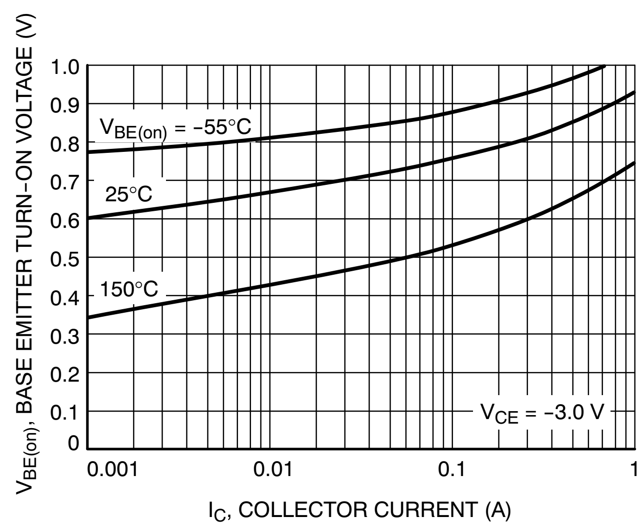


Figure 6. Base Emitter Turn−On Voltage vs. Collector Current

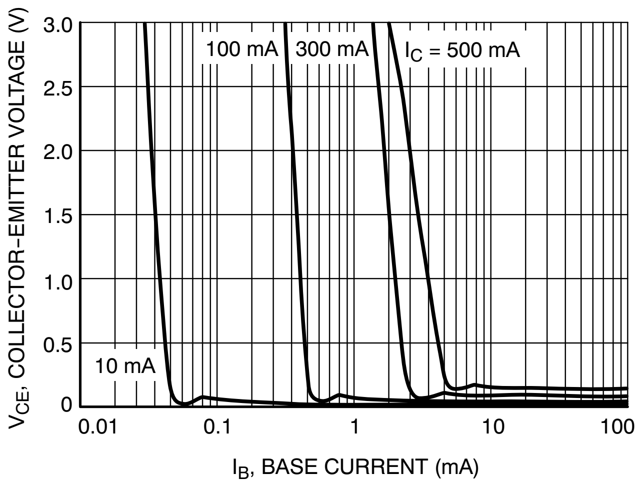


Figure 7. Saturation Region @ 25°C

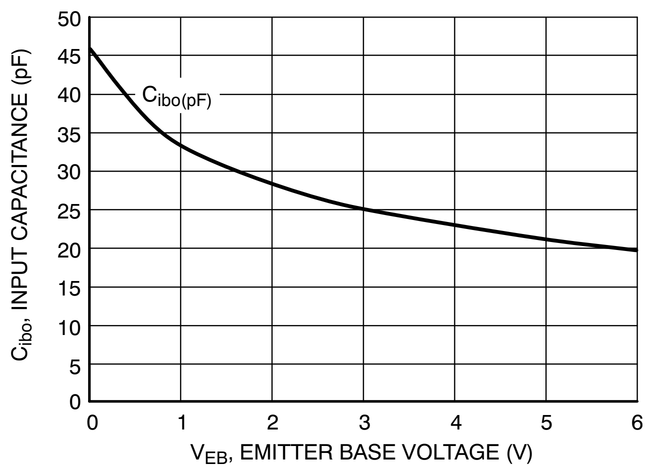


Figure 8. Input Capacitance

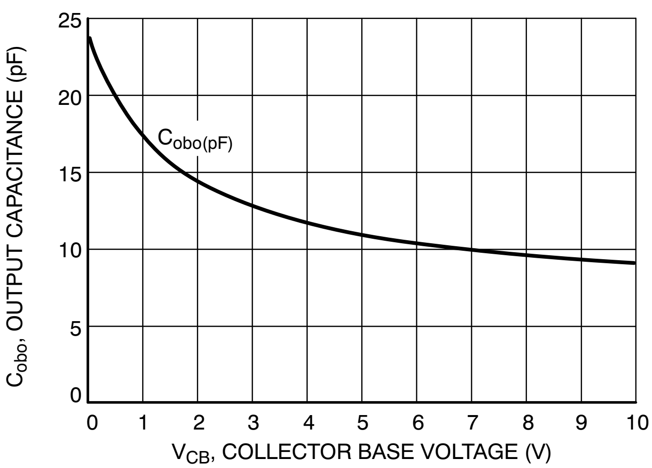


Figure 9. Output Capacitance

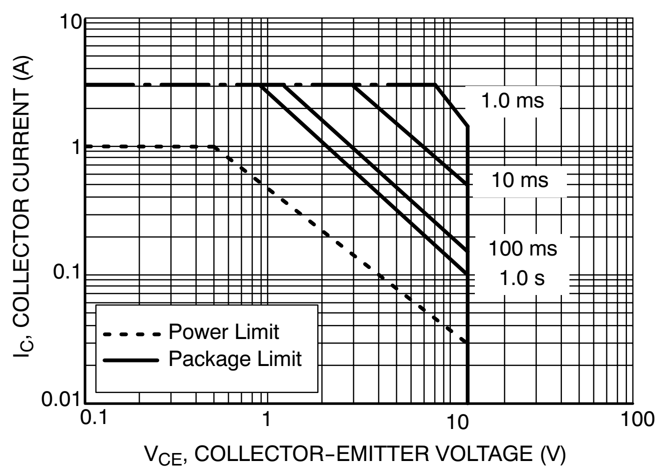
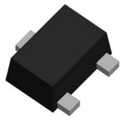


Figure 10. Safe Operating Area

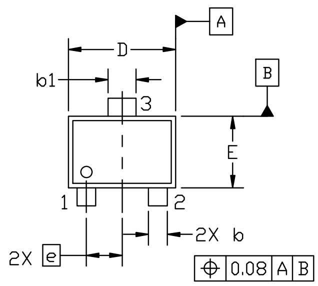


SOT−723 1.20x0.80x0.50, 0.40P
CASE 631AA
ISSUE E

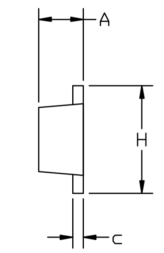
DATE 24 JAN 2024

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.

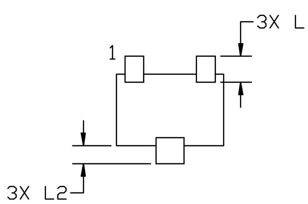
	MILLIMETERS		
DIM	MIN.	NOM.	MAX.
A	0.45	0.50	0.55
b	0.15	0.21	0.27
b1	0.25	0.31	0.37
c	0.07	0.12	0.17
D	1.15	1.20	1.25
E	0.75	0.80	0.85
e	0.40 BSC		
H	1.15	1.20	1.25
L	0.29 REF		
L2	0.15	0.20	0.25



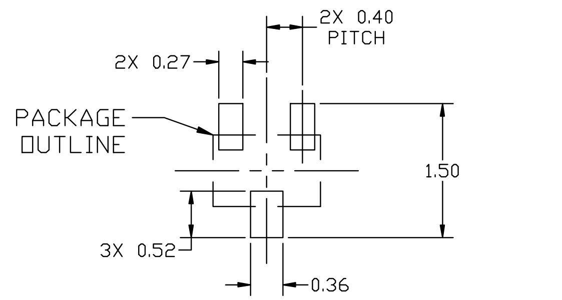
TOP VIEW



SIDE VIEW



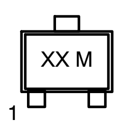
BOTTOM VIEW



RECOMMENDED MOUNTING FOOTPRINT

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

ADDITIONAL INFORMATION

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