NSS12200WT1G

12 V, 3 A, Low $V_{CE(sat)}$ PNP Transistor

ON Semiconductor's e^2PowerEdge 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^2PowerEdge 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 (3 A)
- High Power Handling (Up to 650 mW)
- Low $V_{CE(s)}$ (170 mV Typical @ 1 A)
- 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

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}	−2.0 −3.0	Adc
Electrostatic Discharge	ESD	HBM Class 3 MM Class C	

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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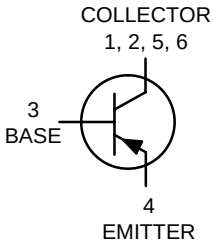
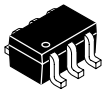
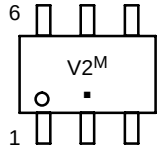
12 VOLTS
3.0 AMPS
PNP LOW $V_{CE(sat)}$ TRANSISTOR
EQUIVALENT $R_{DS(on)}$ 163 mΩ





SC−88/SOT−363
CASE 419B
STYLE 20

DEVICE MARKING



V2 = Specific Device Code
M = Date Code
▪ = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping†
NSS12200WT1G	SOT−363 (Pb−Free)	3000/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.

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THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 1)	450 3.6	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$ (Note 1)	275	°C/W
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 2)	650 5.2	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$ (Note 2)	192	°C/W
Thermal Resistance, Junction−to−Lead 6	$R_{\theta JL}$	105	°C/W
Total Device Dissipation (Single Pulse < 10 sec.)	P_D Single	1.4	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	−15	−	Vdc
Collector−Base Breakdown Voltage, (I_C = −0.1 mAdc, I_E = 0)	$V_{(BR)CBO}$	−12	−25	−	Vdc
Emitter−Base Breakdown Voltage, (I_E = −0.1 mAdc, I_C = 0)	$V_{(BR)EBO}$	−5.0	−7.0	−	Vdc
Collector Cutoff Current, (V_{CB} = −12 Vdc, I_E = 0)	I_{CBO}	−	−0.02	−0.1	μAdc
Collector−Emitter Cutoff Current, (V_{CES} = −12 Vdc, I_E = 0)	I_{CES}	−	−0.03	−0.1	μAdc
Emitter Cutoff Current, (V_{CES} = −5.0 Vdc, I_E = 0)	I_{EBO}	−	−0.03	−0.1	μAdc
ON CHARACTERISTICS					
DC Current Gain (Note 3) (I_C = −0.5 A, V_{CE} = −1.5 V) (I_C = −0.8 A, V_{CE} = −1.5 V) (I_C = −1.0 A, V_{CE} = −1.5 V)	h_{FE}	 100 100 100	 180 165 160	 − 300 −	
Collector−Emitter Saturation Voltage (Note 3) (I_C = −0.5 A, I_B = −10 mA) (I_C = −0.8 A, I_B = −16 mA) (I_C = −1.0 A, I_B = −20 mA)	$V_{CE(sat)}$	 − − −	 −0.10 −0.14 −0.17	 −0.160 −0.235 −0.290	V
Base−Emitter Saturation Voltage (Note 3) (I_C = −1.0 A, I_B = −20 mA)	$V_{BE(sat)}$	−	−0.84	−0.95	V
Base−Emitter Turn−on Voltage (Note 3) (I_C = −1.0 A, V_{CE} = −1.5 V)	$V_{BE(on)}$	−	−0.81	−0.95	V
Cutoff Frequency (I_C = −100 mA, V_{CE} = −5.0 V, f = 100 MHz)	f_T	−	100	−	MHz
Output Capacitance (V_{CB} = −1.5 V, f = 1.0 MHz)	C_{obo}	−	50	65	pF

1. FR−4, Minimum Pad, 1 oz Coverage.
2. FR−4, 1″ Pad, 1 oz Coverage.
3. Pulsed Condition: Pulse Width < 300 μsec, Duty Cycle < 2%.

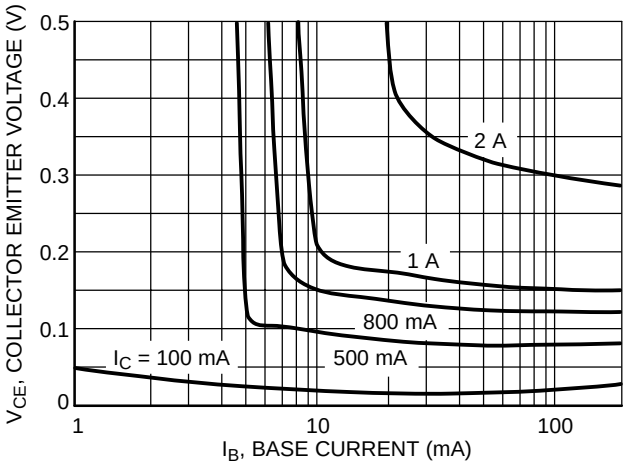


Figure 1. Collector Emitter Voltage vs. Base Current

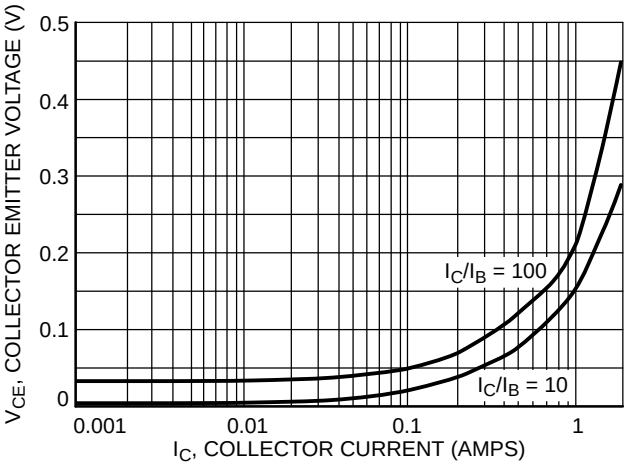


Figure 2. Collector Emitter Voltage vs. Collector Current

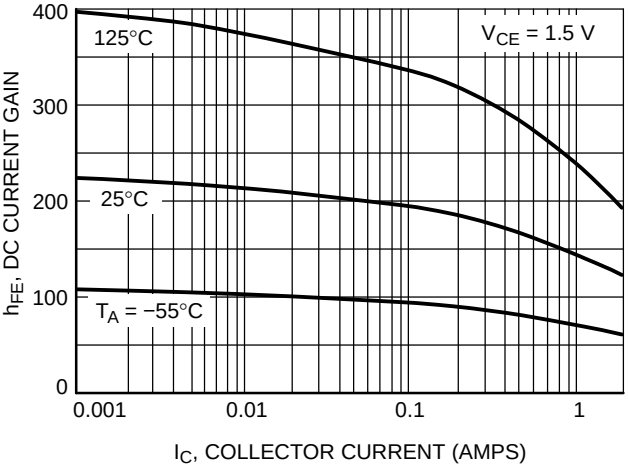


Figure 3. DC Current Gain vs. Collector Current

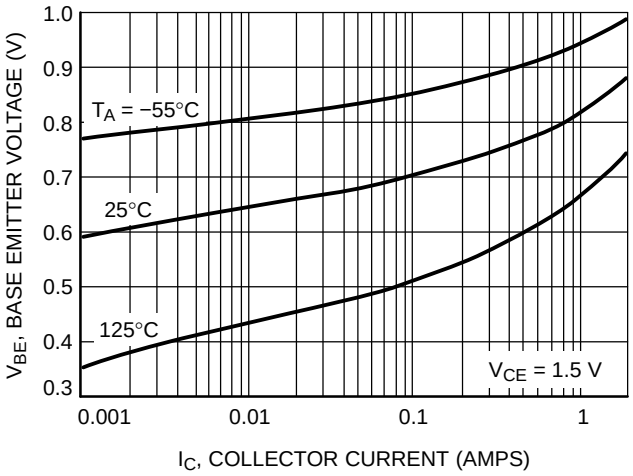


Figure 4. Base Emitter Voltage vs. Collector Current

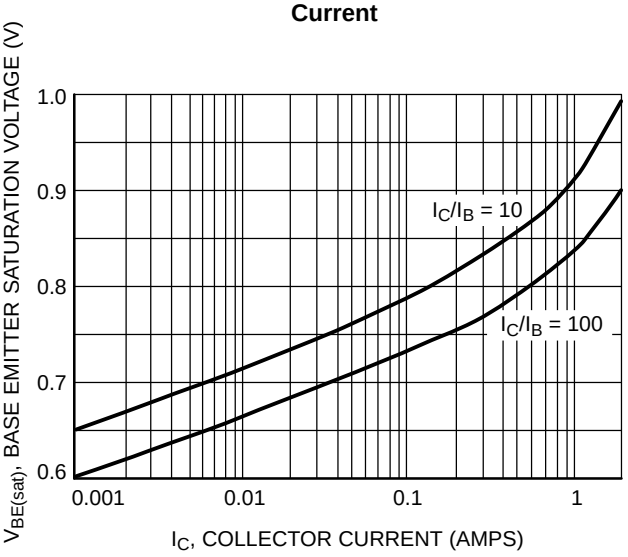


Figure 5. Base Emitter Saturation Voltage vs. Base Current

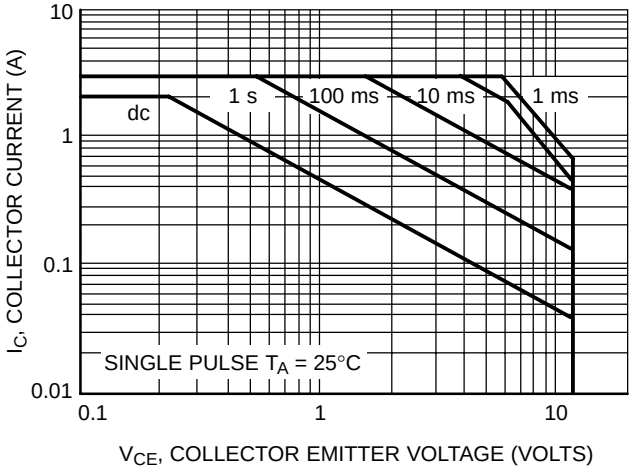


Figure 6. Safe Operating Area

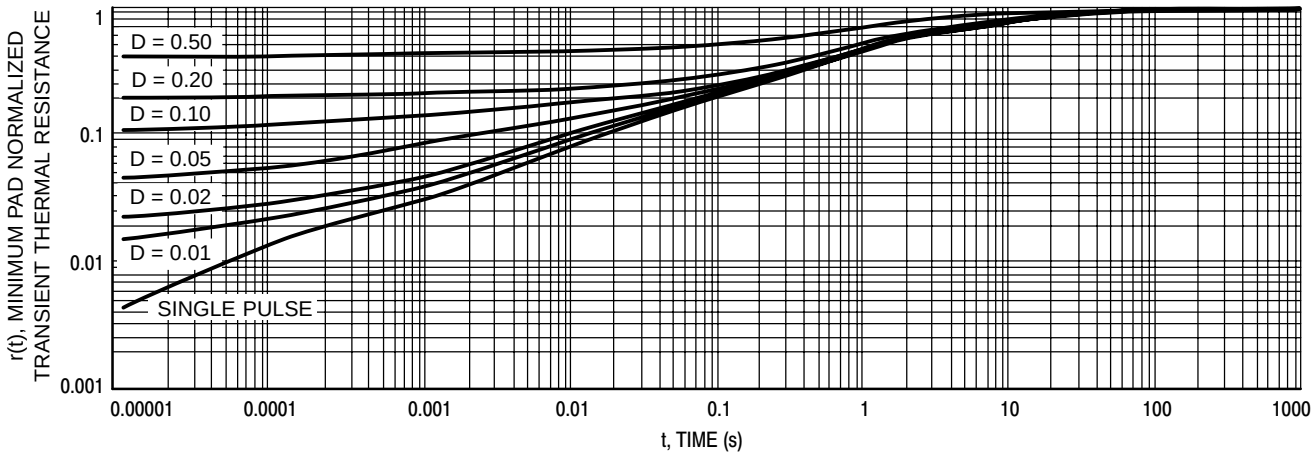
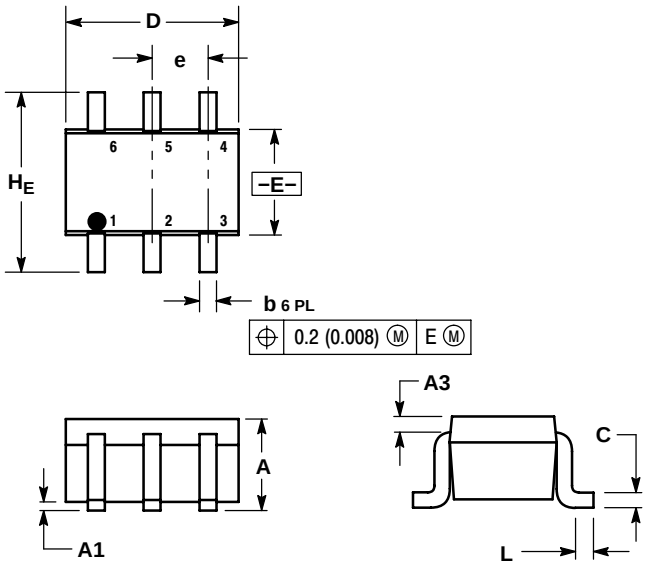


Figure 7. Normalized Thermal Response

PACKAGE DIMENSIONS

SC−88/SC70−6/SOT−363
CASE 419B−02
ISSUE V

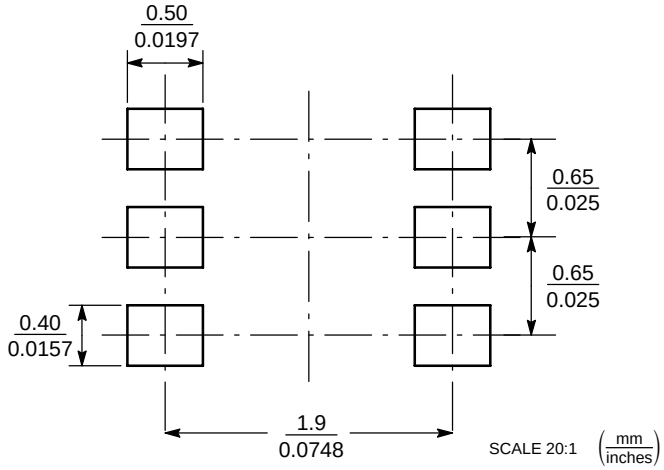


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B−01 OBSOLETE, NEW STANDARD 419B−02.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3		0.20 REF			0.008 REF	
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e		0.65 BSC			0.026 BSC	
L	0.10	0.20	0.30	0.004	0.008	0.012
H_E	2.00	2.10	2.20	0.078	0.082	0.086

STYLE 20:
PIN 1. COLLECTOR
2. COLLECTOR
3. BASE
4. EMITTER
5. COLLECTOR
6. COLLECTOR

SOLDERING 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.

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