

NSL12AW

High Current Surface Mount PNP Silicon Low $V_{CE(sat)}$ Transistor for Battery Operated Applications

Features:

- High Current Capability (3 A)
- High Power Handling (Up to 650 mW)
- Low $V_{CE(s)}$ (170 mV Typical @ 1 A)
- Small Size

Benefits:

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

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

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	

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D (Note 1)	450 3.6	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (Note 1)	275	$^\circ\text{C/W}$
Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D (Note 2)	650 5.2	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (Note 2)	192	$^\circ\text{C/W}$
Thermal Resistance, Junction to Lead 6	$R_{\theta JL}$	105	$^\circ\text{C/W}$
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	$^\circ\text{C}$

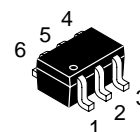
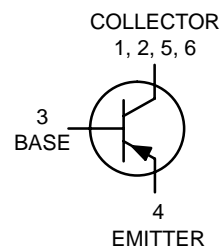
1. FR-4, Minimum Pad, 1 oz Coverage
2. FR-4, 1" Pad, 1 oz Coverage



ON Semiconductor®

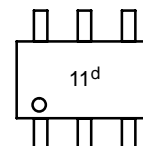
<http://onsemi.com>

**12 VOLTS
3.0 AMPS
PNP TRANSISTOR**



**CASE 419B
SOT-363/SC-88
STYLE 20**

DEVICE MARKING



11 = Specific Device Code
^d = Date Code

ORDERING INFORMATION

Device	Package	Shipping
NSL12AWT1	SOT-416	3000/Tape & Reel

NSL12AW

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

Characteristic	Symbol	Min	Typical	Max	Unit
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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

3. Pulsed Condition: Pulse Width < 300 μsec, Duty Cycle < 2%

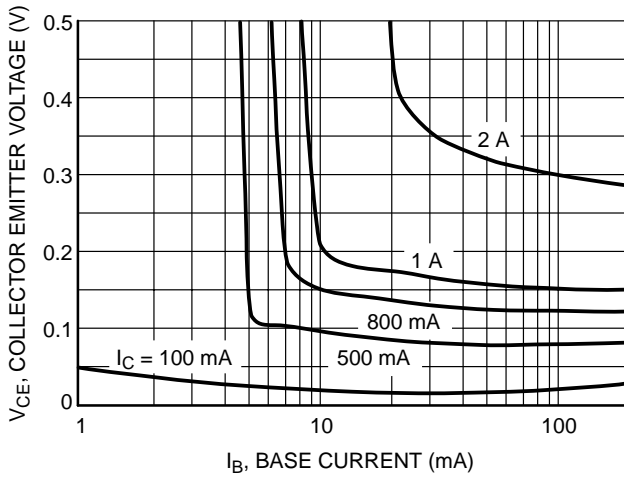


Figure 1. Collector Emitter Voltage versus Base Current

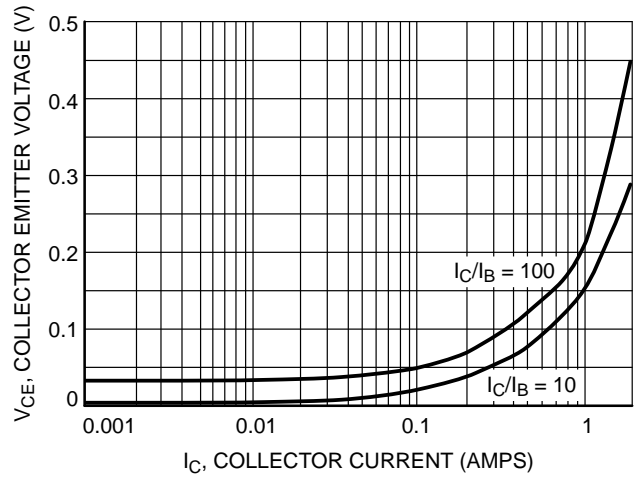


Figure 2. Collector Emitter Voltage versus Collector Current

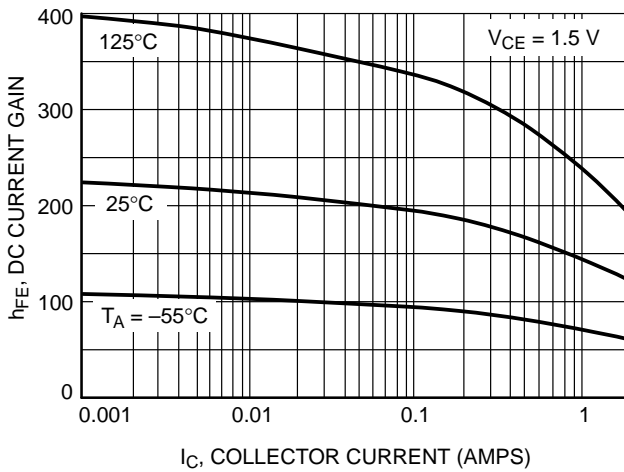


Figure 3. DC Current Gain versus Collector Current

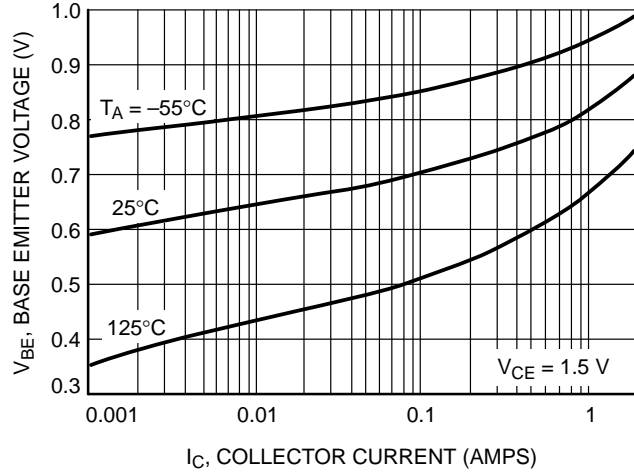


Figure 4. Base Emitter Voltage versus Collector Current

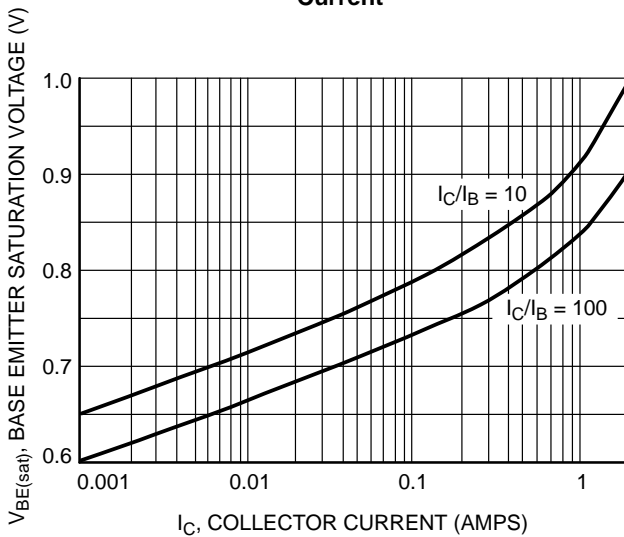


Figure 5. Base Emitter Saturation Voltage versus Base Current

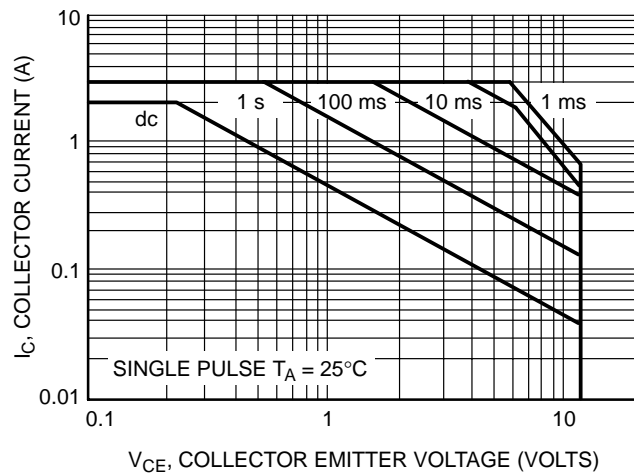


Figure 6. Safe Operating Area

NSL12AW

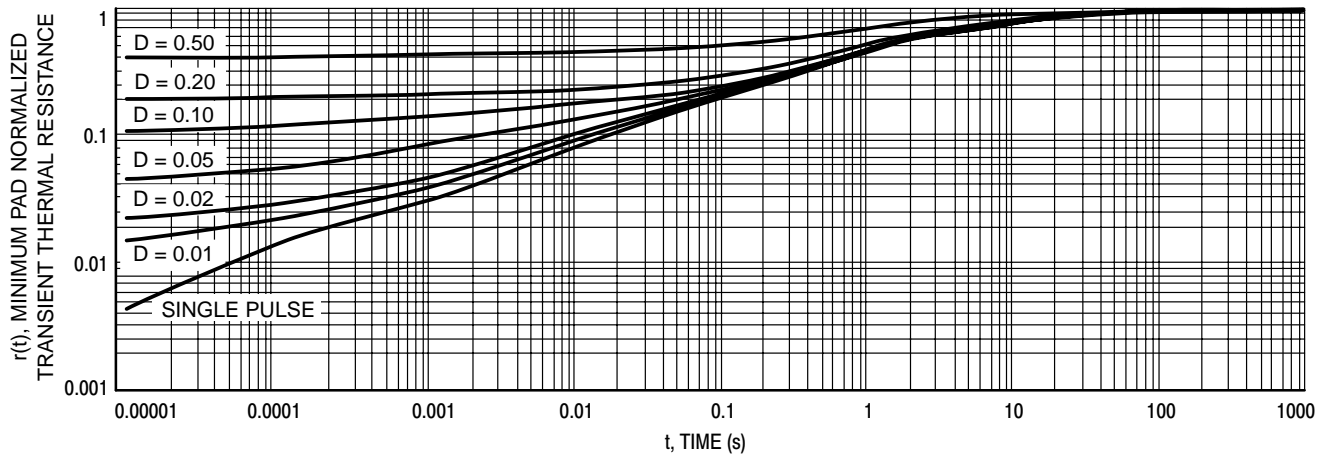
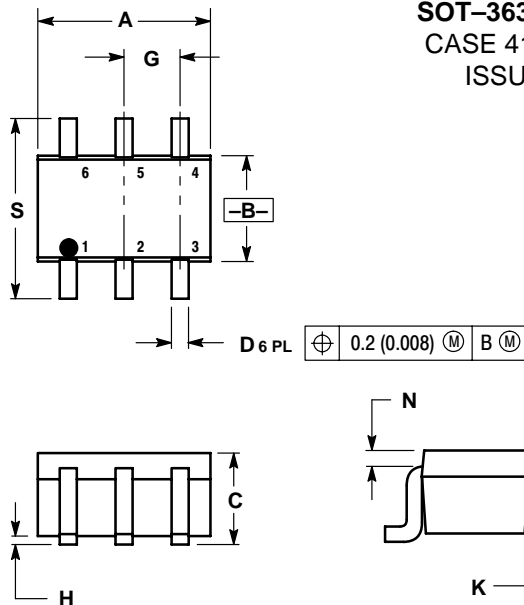


Figure 7. Normalized Thermal Response

PACKAGE DIMENSIONS


SOT-363/SC-88
CASE 419B-02
ISSUE H



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

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

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