

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 | $^\circ\text{C}/\text{W}$ |
| 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 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Lead 6 | $R_{\theta JL}$ | 105 | $^\circ\text{C}/\text{W}$ |
| 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 | $^\circ\text{C}$ |

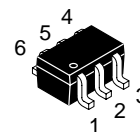
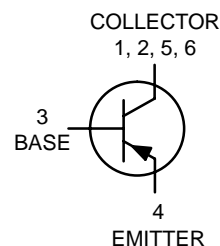
1. FR-4, Minimum Pad, 1 oz Coverage
2. FR-4, 1" Pad, 1 oz Coverage



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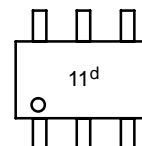
<http://onsemi.com>

**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 |
|--|----------------------|------|---------|------|------|
| 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%

NSL12AW

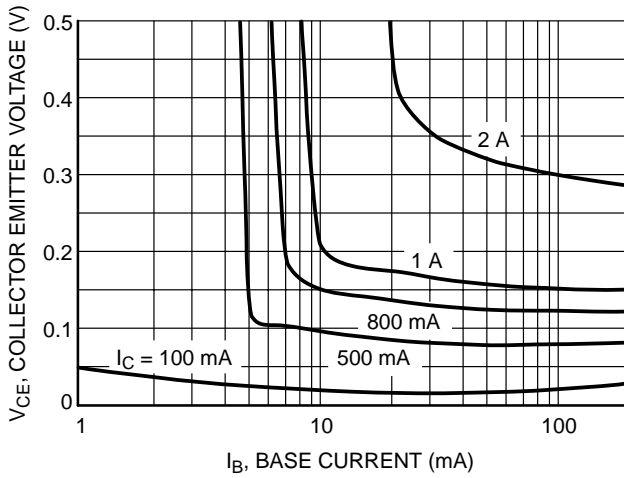


Figure 1. Collector Emitter Voltage versus Base Current

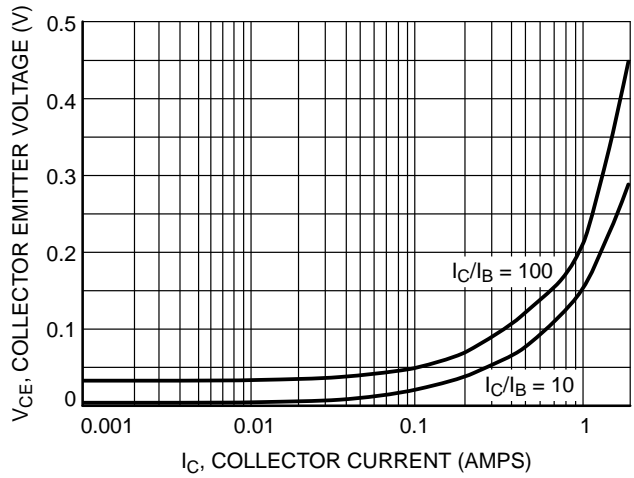


Figure 2. Collector Emitter Voltage versus Collector Current

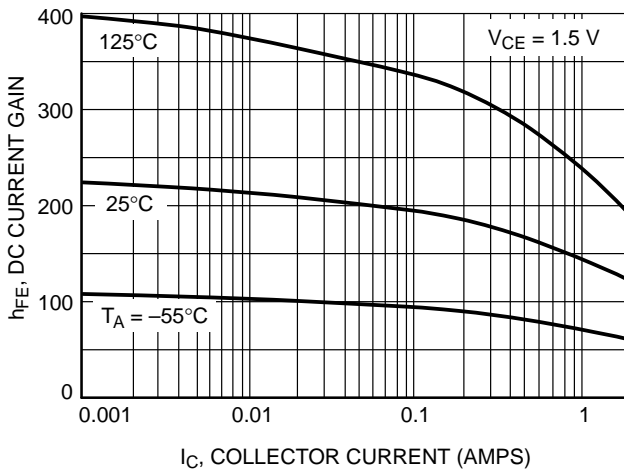


Figure 3. DC Current Gain versus Collector Current

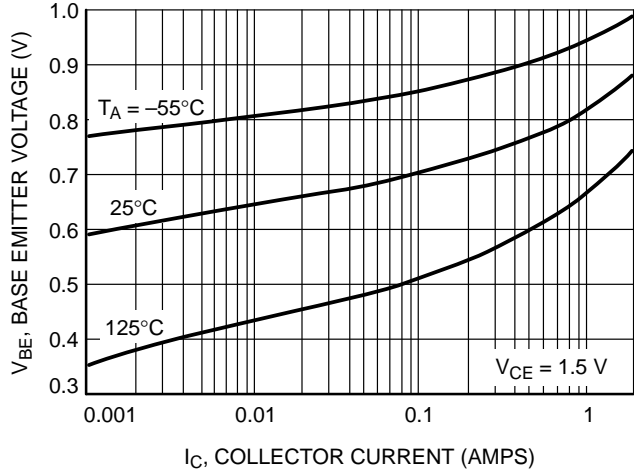


Figure 4. Base Emitter Voltage versus Collector Current

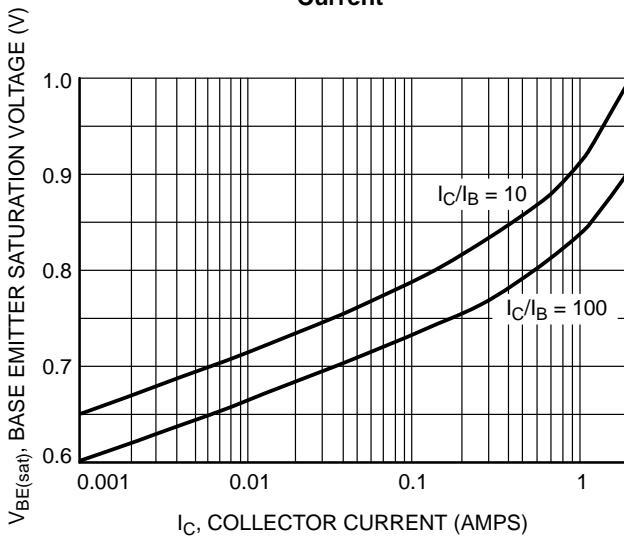


Figure 5. Base Emitter Saturation Voltage versus Base Current

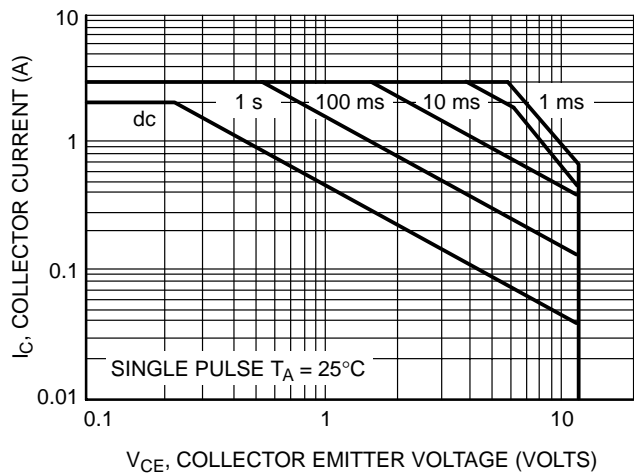


Figure 6. Safe Operating Area

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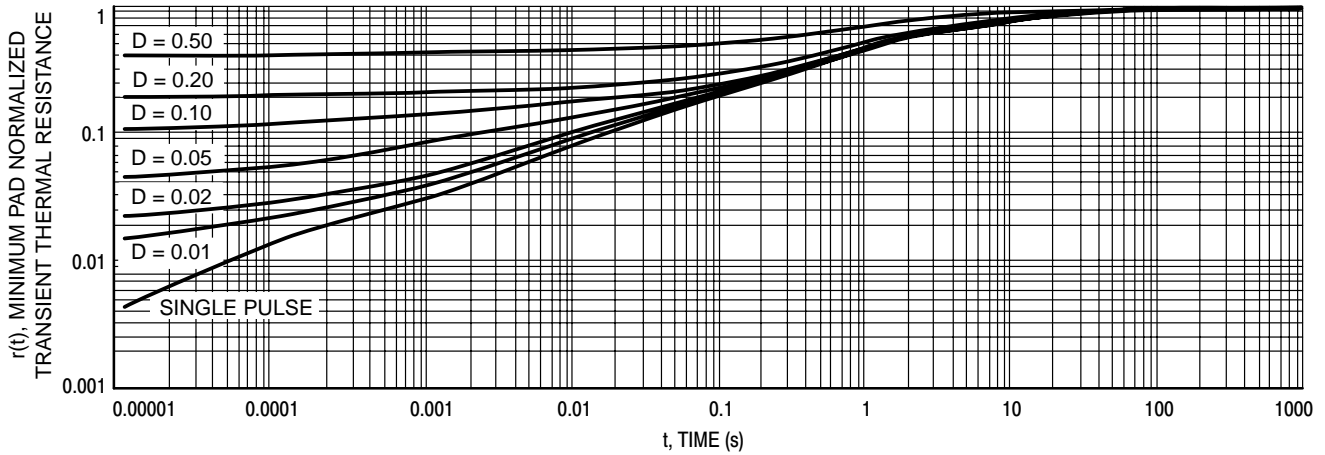
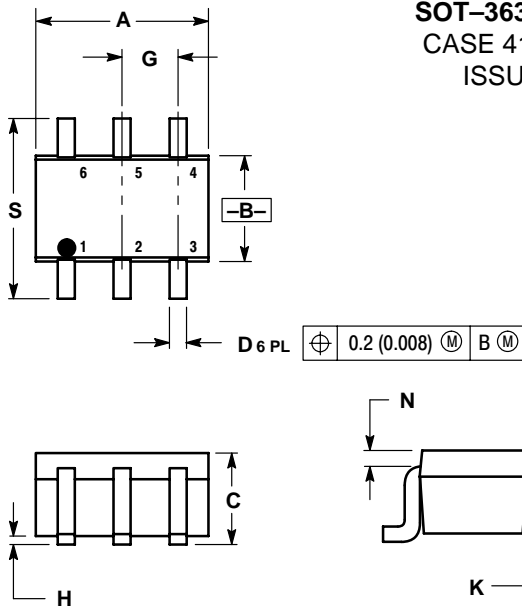


Figure 7. Normalized Thermal Response

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

1. COLLECTOR
2. COLLECTOR
3. BASE
4. EMITTER
5. COLLECTOR
6. COLLECTOR

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