

# ON Semiconductor

## Is Now

# onsemi™

To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

onsemi and onsemi and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use onsemi products for any such unintended or unauthorized application, Buyer shall indemnify and hold onsemi and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that onsemi was negligent regarding the design or manufacture of the part. onsemi is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.

# MOSFET – Power, Single, P-Channel, Schottky Diode, Schottky Barrier Diode

## -30 V, -4.0 A, 20 V, 2.2 A



ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

## NTMD4184PF

### Features

- FETKY™ Surface Mount Package Saves Board Space
- Independent Pin-Out for MOSFET and Schottky Allowing for Design Flexibility
- Low  $R_{DS(on)}$  MOSFET and Low  $V_F$  Schottky to Minimize Conduction Losses
- Optimized Gate Charge to Minimize Switching Losses
- This is a Pb-Free Device

### Applications

- Disk Drives
- DC-DC Converters
- Printers

### MOSFET MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise stated)

| Rating  | Symbol         | Value                    | Unit             |
|---|----------------|--------------------------|------------------|
| Drain-to-Source Voltage   | $V_{DSS}$      | -30                      | V                |
| Gate-to-Source Voltage  | $V_{GS}$       | $\pm 20$                 | V                |
| Continuous Drain Current $R_{\theta JA}$ (Note 1)                 | $I_D$          | $T_A = 25^\circ\text{C}$ | -3.3             |
|   |                | $T_A = 70^\circ\text{C}$ | -2.6             |
| Power Dissipation $R_{\theta JA}$ (Note 1)                        | $P_D$          | $T_A = 25^\circ\text{C}$ | 1.6              |
|   |                | $T_A = 70^\circ\text{C}$ |                  |
| Continuous Drain Current $R_{\theta JA}$ (Note 2)                 | $I_D$          | $T_A = 25^\circ\text{C}$ | -2.3             |
|   |                | $T_A = 70^\circ\text{C}$ | -1.8             |
| Power Dissipation $R_{\theta JA}$ (Note 2)                        | $P_D$          | $T_A = 25^\circ\text{C}$ | 0.77             |
|   |                | $T_A = 70^\circ\text{C}$ |                  |
| Continuous Drain Current $R_{\theta JA} t < 10$ s (Note 1)        | $I_D$          | $T_A = 25^\circ\text{C}$ | -4.0             |
|   |                | $T_A = 70^\circ\text{C}$ | -3.2             |
| Power Dissipation $R_{\theta JA} t < 10$ s (Note 1)               | $P_D$          | $T_A = 25^\circ\text{C}$ | 2.31             |
|   |                | $T_A = 70^\circ\text{C}$ |                  |
| Pulsed Drain Current  | $I_{DM}$       | -10                      | A                |
| Operating Junction and Storage Temperature                        | $T_J, T_{STG}$ | -55 to +150              | $^\circ\text{C}$ |
| Source Current (Body Diode)                                       | $I_S$          | -1.3                     | A                |
| Lead Temperature for Soldering Purposes (1/8" from case for 10 s) | $T_L$          | 260                      | $^\circ\text{C}$ |

### SCHOTTKY MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise stated)

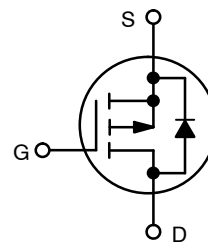
| Rating                                      | Symbol    | Value        | Unit |
|---|-----------|--------------|------|
| Peak Repetitive Reverse Voltage             | $V_{RRM}$ | 20           | V    |
| DC Blocking Voltage                         | $V_R$     | 20           | V    |
| Average Rectified Forward Current, (Note 1) | $I_F$     | Steady State | 2.2  |
|   |           | $t < 10$ s   | 3.2  |

### P-CHANNEL MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$ Max        | $I_D$ Max |
|---------------|-------------------------|-----------|
| -30 V         | 95 m $\Omega$ @ -10 V   | -4.0 A    |
|               | 165 m $\Omega$ @ -4.5 V |           |

### SCHOTTKY DIODE

| $V_R$ Max | $V_F$ Max | $I_F$ Max |
|-----------|-----------|-----------|
| 20 V      | 0.58 V    | 2.2 A     |

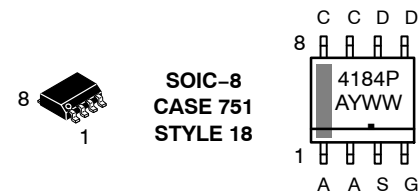


P-Channel MOSFET



Schottky Diode

### MARKING DIAGRAM & PIN ASSIGNMENT



4184P = Device Code  
 A = Assembly Location  
 Y = Year  
 WW = Work Week  
 ■ = Pb-Free Package

### ORDERING INFORMATION

| Device        | Package          | Shipping†        |
|---------------|------------------|------------------|
| NTMD4184PFR2G | SOIC-8 (Pb-Free) | 2500/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.

# NTMD4184PF

## THERMAL RESISTANCE MAXIMUM RATINGS

| Parameter MOSFET & Schottky                               | Symbol          | Max | Unit |
|---|-----------------|-----|------|
| Junction-to-Ambient – Steady State (Note 1)               | $R_{\theta JA}$ | 79  | °C/W |
| Junction-to-Ambient – $t \leq 10$ s Steady State (Note 1) | $R_{\theta JA}$ | 54  |      |
| Junction-to-FOOT (Drain) Equivalent to $R_{\theta JC}$    | $R_{\theta JF}$ | 50  |      |
| Junction-to-Ambient – Steady State (Note 2)               | $R_{\theta JA}$ | 163 |      |

- Surface-mounted on FR4 board using 1 inch sq pad size, 1 oz Cu.
- Surface-mounted on FR4 board using the minimum recommended pad size.

## ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Test Condition | Min | Typ | Max | Unit |
|----------------|--------|----------------|-----|-----|-----|------|
|----------------|--------|----------------|-----|-----|-----|------|

### OFF CHARACTERISTICS

|   |                   |   |     |    |           |               |
|---|-------------------|---|-----|----|-----------|---------------|
| Drain-to-Source Breakdown Voltage                         | $V_{(BR)DSS}$     | $V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$   | -30 |    |           | V             |
| Drain-to-Source Breakdown Voltage Temperature Coefficient | $V_{(BR)DSS}/T_J$ |   |     | 30 |           | mV/°C         |
| Zero Gate Voltage Drain Current                           | $I_{DSS}$         | $V_{GS} = 0\text{ V}, V_{DS} = -24\text{ V}$    |     |    | -1.0      | $\mu\text{A}$ |
|   |                   | $T_J = 125^\circ\text{C}$                       |     |    | -10       |               |
| Gate-to-Source Leakage Current                            | $I_{GSS}$         | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ |     |    | $\pm 100$ | nA            |

### ON CHARACTERISTICS (Note 3)

|  |                  |   |      |     |      |            |
|--|------------------|---|------|-----|------|------------|
| Gate Threshold Voltage                     | $V_{GS(TH)}$     | $V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$   | -1.0 |     | -3.0 | V          |
| Negative Threshold Temperature Coefficient | $V_{GS(TH)}/T_J$ |   |      | 4.4 |      | mV/°C      |
| Drain-to-Source On Resistance              | $R_{DS(on)}$     | $V_{GS} = -10\text{ V}, I_D = -3.0\text{ A}$<br>$V_{GS} = -4.5\text{ V}, I_D = -1.5\text{ A}$ |      | 70  | 95   | m $\Omega$ |
|  |                  |   |      | 120 | 165  |            |
| Forward Transconductance                   | $g_{FS}$         | $V_{DS} = -1.5\text{ V}, I_D = -3.0\text{ A}$   |      | 5.0 |      | S          |

### CHARGES, CAPACITANCES AND GATE RESISTANCE

|                              |              |  |  |     |     |    |
|------------------------------|--------------|--|--|-----|-----|----|
| Input Capacitance            | $C_{ISS}$    | $V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = -10\text{ V}$     |  | 280 | 360 | pF |
| Output Capacitance           | $C_{OSS}$    |  |  | 80  | 110 |    |
| Reverse Transfer Capacitance | $C_{RSS}$    |  |  | 52  | 80  |    |
| Total Gate Charge            | $Q_{G(TOT)}$ | $V_{GS} = -4.5\text{ V}, V_{DS} = -10\text{ V}, I_D = -3.0\text{ A}$ |  | 2.8 | 4.2 | nC |
| Threshold Gate Charge        | $Q_{G(TH)}$  |  |  | 0.4 |     |    |
| Gate-to-Source Charge        | $Q_{GS}$     |  |  | 1.1 |     |    |
| Gate-to-Drain Charge         | $Q_{GD}$     |  |  | 1.1 |     |    |
| Total Gate Charge            | $Q_{G(TOT)}$ | $V_{GS} = -10\text{ V}, V_{DS} = -10\text{ V}, I_D = -3.0\text{ A}$  |  | 5.8 | 8.8 | nC |

### SWITCHING CHARACTERISTICS (Note 4)

|                     |              |  |  |     |     |    |
|---------------------|--------------|--|--|-----|-----|----|
| Turn-On Delay Time  | $t_{d(ON)}$  | $V_{GS} = -10\text{ V}, V_{DS} = -10\text{ V}, I_D = -1.0\text{ A}, R_G = 6.0\ \Omega$ |  | 7.2 | 15  | ns |
| Rise Time           | $t_r$        |  |  | 12  | 24  |    |
| Turn-Off Delay Time | $t_{d(OFF)}$ |  |  | 18  | 36  |    |
| Fall Time           | $t_f$        |  |  | 2.6 | 6.0 |    |

### DRAIN-TO-SOURCE CHARACTERISTICS

|                       |          |  |                           |      |      |      |    |
|-----------------------|----------|--|---------------------------|------|------|------|----|
| Forward Diode Voltage | $V_{SD}$ | $V_{GS} = 0\text{ V}, I_D = -1.3\text{ A}$                                       | $T_J = 25^\circ\text{C}$  |      | -0.8 | -1.0 | V  |
|                       |          |  | $T_J = 125^\circ\text{C}$ |      | 0.7  |      | ns |
| Reverse Recovery Time | $t_{RR}$ | $V_{GS} = 0\text{ V}, d_{IS}/dt = 100\text{ A}/\mu\text{s}, I_S = -1.3\text{ A}$ |                           | 12.8 |      |      |    |
| Charge Time           | $t_a$    |  |                           | 10   |      |      |    |
| Discharge Time        | $t_b$    |  |                           | 2.8  |      |      |    |
| Reverse Recovery Time | $Q_{RR}$ |  |                           | 7.4  |      |      |    |

# NTMD4184PF

## ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Test Condition | Min | Typ | Max | Unit |
|----------------|--------|----------------|-----|-----|-----|------|
|----------------|--------|----------------|-----|-----|-----|------|

## SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                             | Symbol | Test Conditions      | Min                       | Typ | Max   | Unit |    |
|---------------------------------------|--------|----------------------|---------------------------|-----|-------|------|----|
| Maximum Instantaneous Forward Voltage | $V_F$  | $I_F = 1.0\text{ A}$ | $T_J = 25^\circ\text{C}$  |     | 0.43  | 0.50 | V  |
|                                       |        |                      | $T_J = 125^\circ\text{C}$ |     | 0.35  | 0.39 |    |
|                                       |        | $I_F = 2.0\text{ A}$ | $T_J = 25^\circ\text{C}$  |     | 0.5   | 0.58 |    |
|                                       |        |                      | $T_J = 125^\circ\text{C}$ |     | 0.45  | 0.53 |    |
| Maximum Instantaneous Reverse Current | $I_R$  | $V_R = 10\text{ V}$  | $T_J = 25^\circ\text{C}$  |     | 0.001 | 0.02 | mA |
|                                       |        |                      | $T_J = 125^\circ\text{C}$ |     | 1.2   | 14   |    |
|                                       |        | $V_R = 20\text{ V}$  | $T_J = 25^\circ\text{C}$  |     | 0.004 | 0.05 |    |
|                                       |        |                      | $T_J = 125^\circ\text{C}$ |     | 2.0   | 18   |    |

- Pulse Test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Switching characteristics are independent of operating junction temperatures.

## TYPICAL CHARACTERISTICS

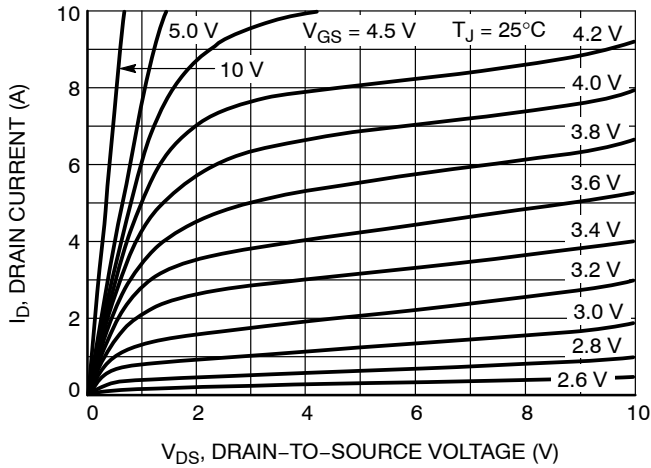


Figure 1. On-Region Characteristics

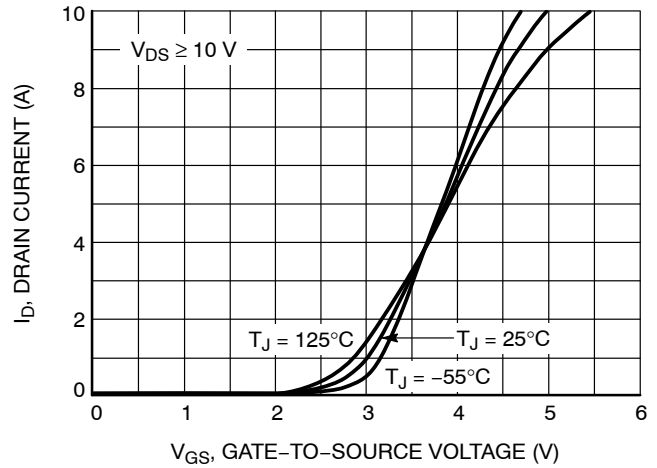


Figure 2. Transfer Characteristics

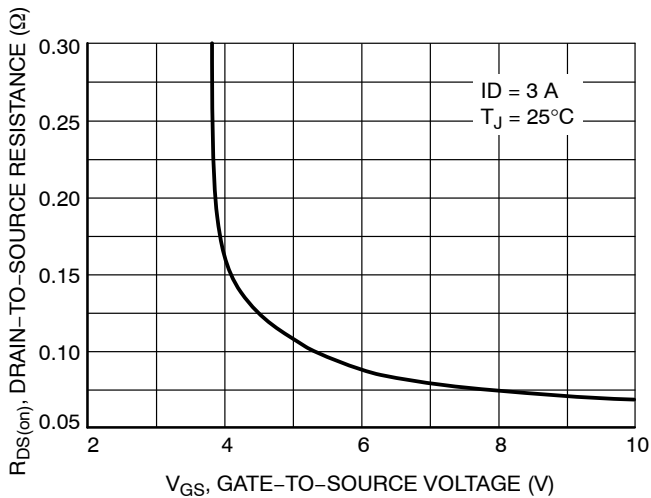


Figure 3. On-Resistance vs. Gate Voltage

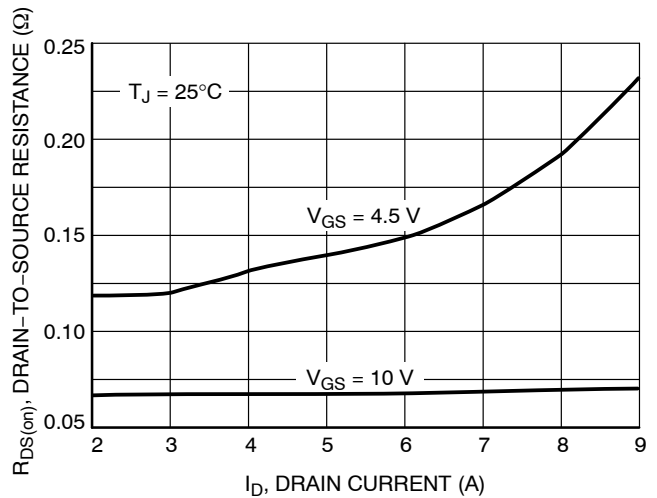
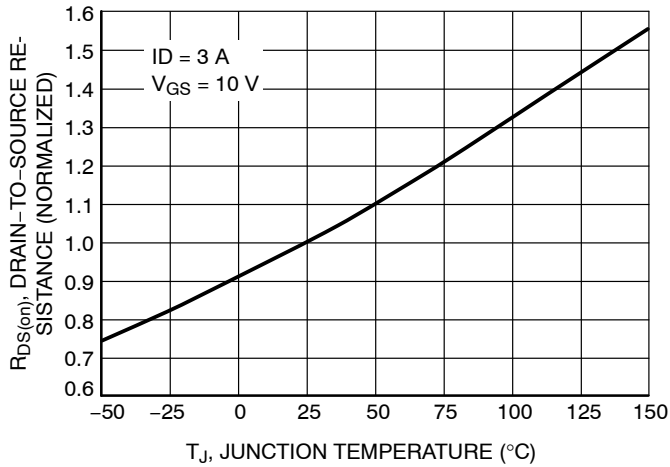


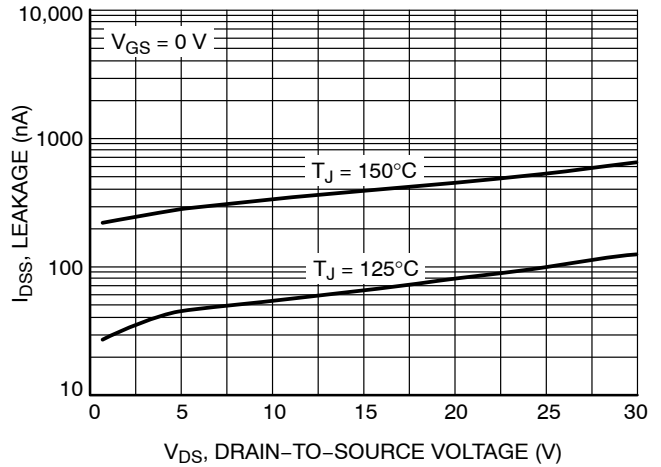
Figure 4. On-Resistance vs. Drain Current and Gate Voltage

# NTMD4184PF

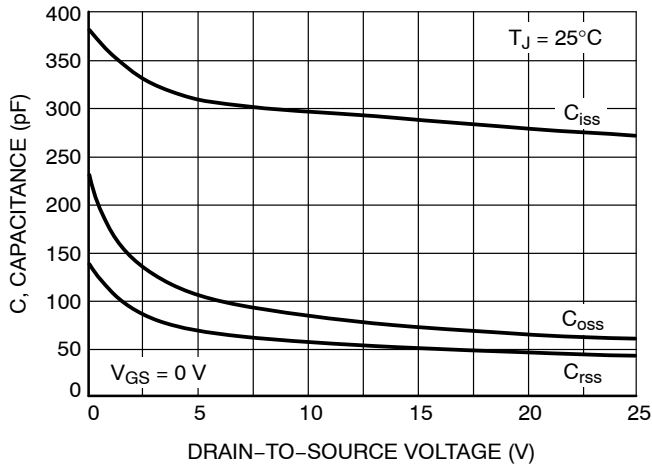
## TYPICAL CHARACTERISTICS



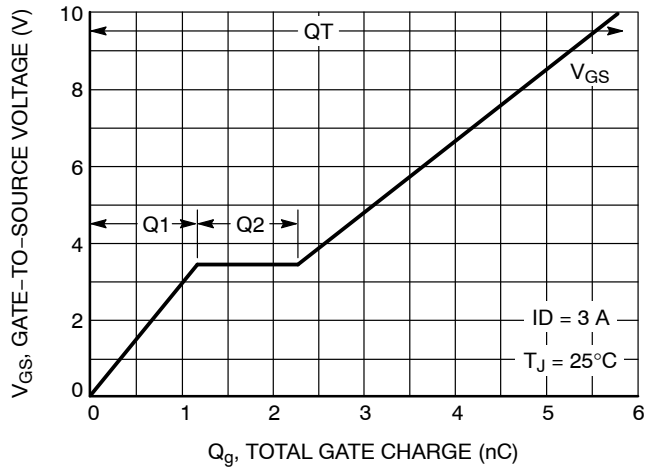
**Figure 5. On-Resistance Variation with Temperature**



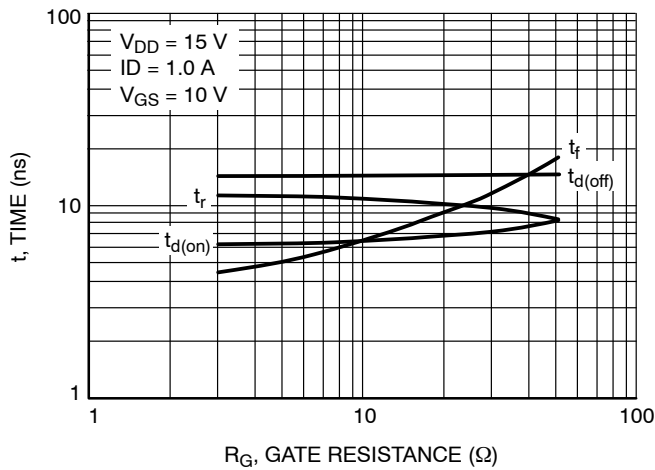
**Figure 6. Drain-to-Source Leakage Current vs. Voltage**



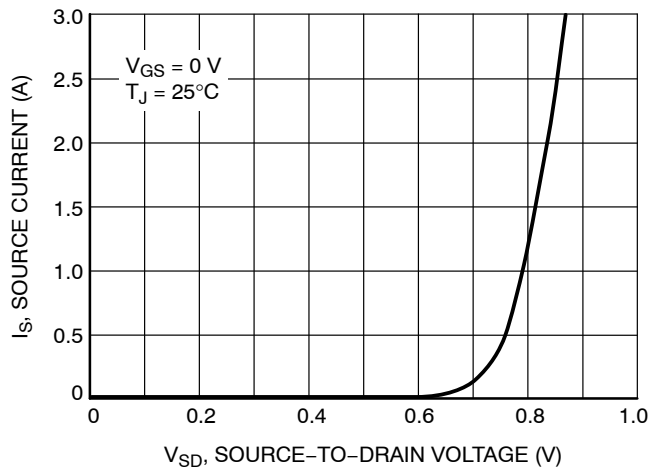
**Figure 7. Capacitance Variation**



**Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge**



**Figure 9. Resistive Switching Time Variation vs. Gate Resistance**



**Figure 10. Diode Forward Voltage vs. Current**

# NTMD4184PF

## TYPICAL CHARACTERISTICS

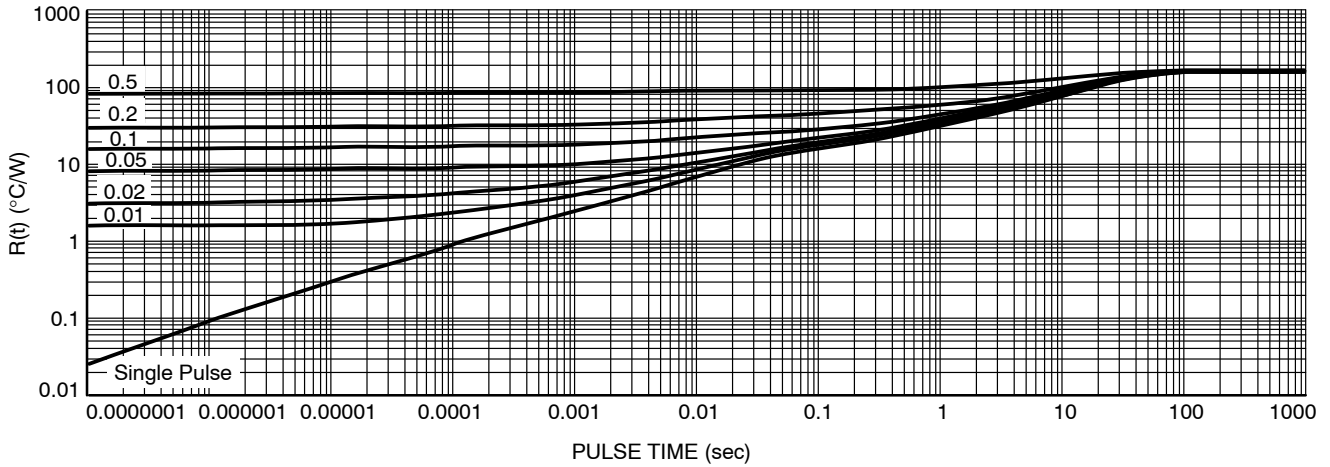


Figure 11. Thermal Response –  $R_{\theta JA}$  at Steady State (min pad)

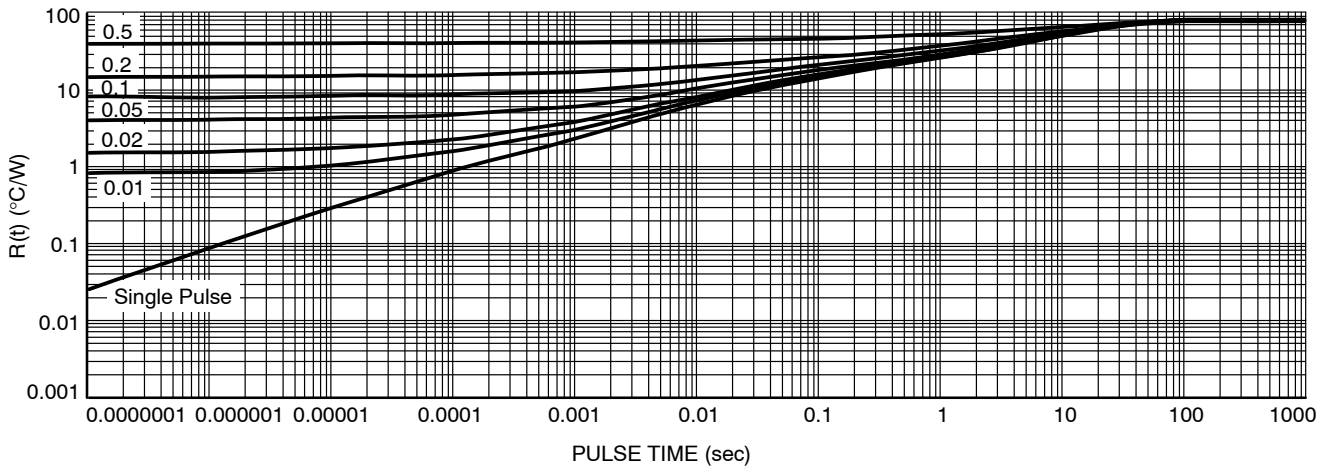


Figure 12. Thermal Response –  $R_{\theta JA}$  at Steady State (1 inch sq pad)

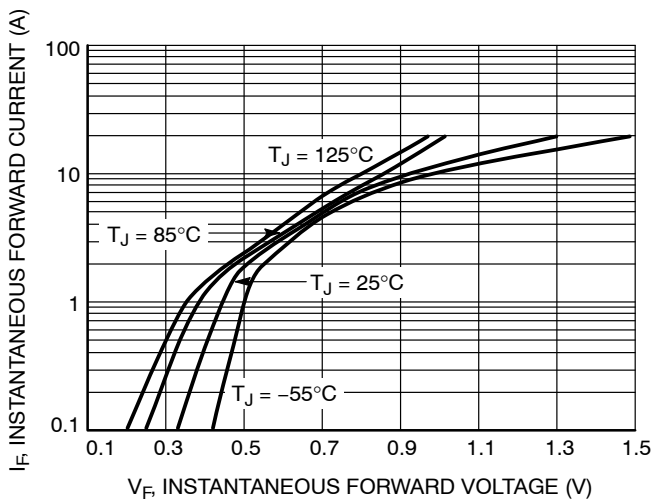


Figure 13. Typical Forward Voltage

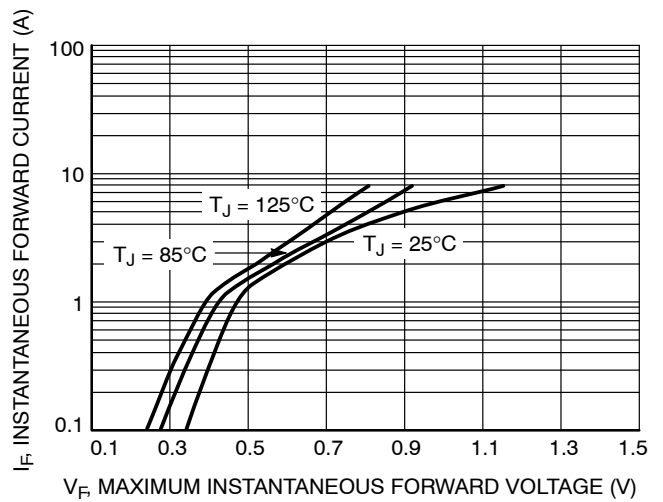


Figure 14. Maximum Forward Voltage

# NTMD4184PF

## TYPICAL CHARACTERISTICS

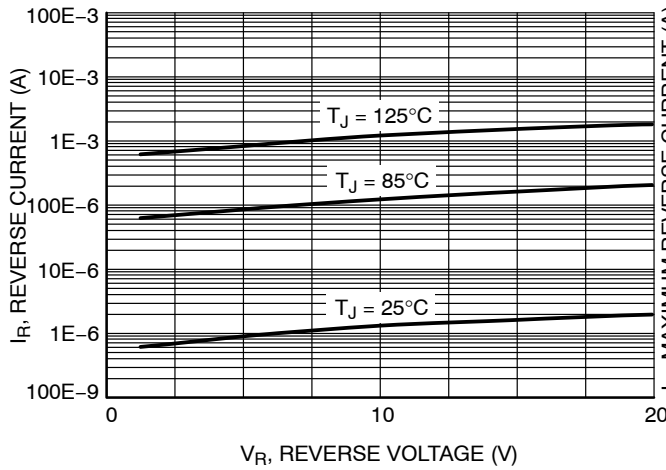


Figure 15. Typical Reverse Current

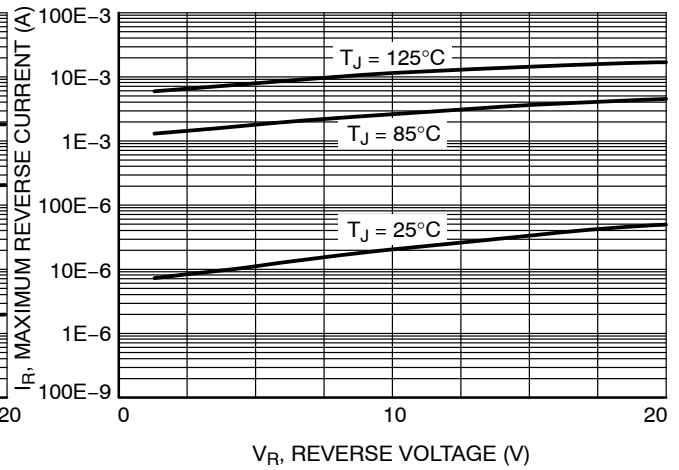


Figure 16. Maximum Reverse Current

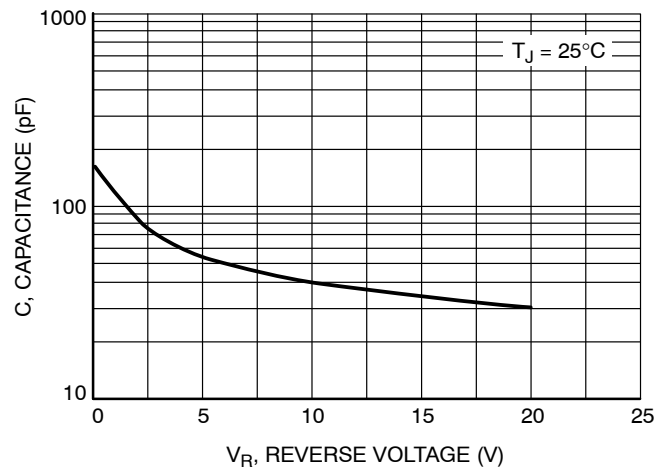
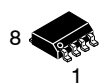


Figure 17. Capacitance

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

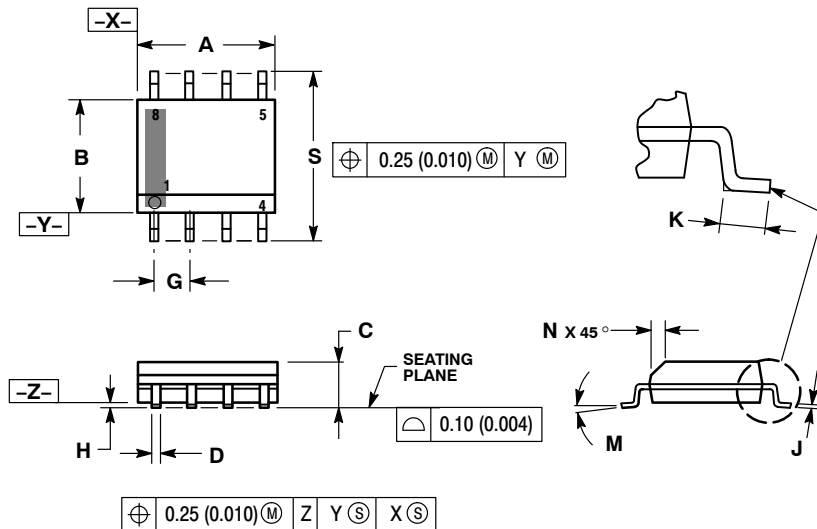
ON Semiconductor®



SCALE 1:1

SOIC-8 NB  
CASE 751-07  
ISSUE AK

DATE 16 FEB 2011



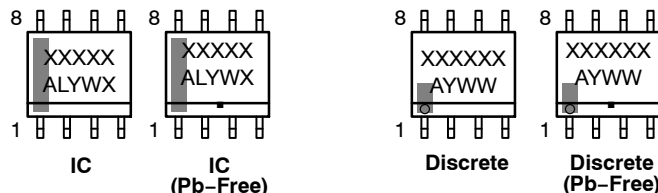
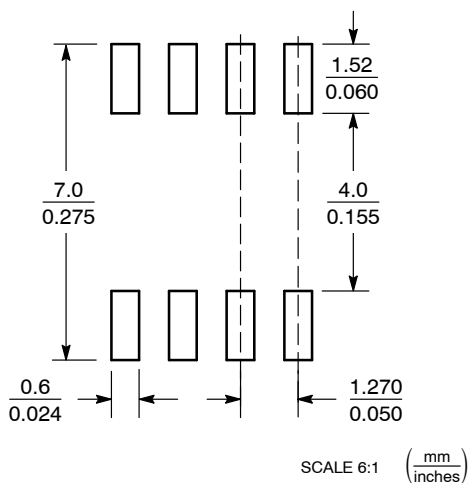
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 4.80        | 5.00 | 0.189     | 0.197 |
| B   | 3.80        | 4.00 | 0.150     | 0.157 |
| C   | 1.35        | 1.75 | 0.053     | 0.069 |
| D   | 0.33        | 0.51 | 0.013     | 0.020 |
| G   | 1.27 BSC    |      | 0.050 BSC |       |
| H   | 0.10        | 0.25 | 0.004     | 0.010 |
| J   | 0.19        | 0.25 | 0.007     | 0.010 |
| K   | 0.40        | 1.27 | 0.016     | 0.050 |
| M   | 0°          | 8°   | 0°        | 8°    |
| N   | 0.25        | 0.50 | 0.010     | 0.020 |
| S   | 5.80        | 6.20 | 0.228     | 0.244 |

### GENERIC MARKING DIAGRAM\*

### SOLDERING FOOTPRINT\*



XXXXXX = Specific Device Code  
A = Assembly Location  
L = Wafer Lot  
Y = Year  
W = Work Week  
■ = Pb-Free Package

XXXXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package

\*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.

### STYLES ON PAGE 2

|                  |             |  |
|------------------|-------------|--|
| DOCUMENT NUMBER: | 98ASB42564B | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| DESCRIPTION:     | SOIC-8 NB   | PAGE 1 OF 2  |

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.



**SOIC-8 NB**  
**CASE 751-07**  
**ISSUE AK**

DATE 16 FEB 2011

- |  |   |   |   |
|--|---|---|---|
| <p><b>STYLE 1:</b><br/>         PIN 1. EMITTER<br/>         2. COLLECTOR<br/>         3. COLLECTOR<br/>         4. EMITTER<br/>         5. EMITTER<br/>         6. BASE<br/>         7. BASE<br/>         8. EMITTER</p>   | <p><b>STYLE 2:</b><br/>         PIN 1. COLLECTOR, DIE, #1<br/>         2. COLLECTOR, #1<br/>         3. COLLECTOR, #2<br/>         4. COLLECTOR, #2<br/>         5. BASE, #2<br/>         6. EMITTER, #2<br/>         7. BASE, #1<br/>         8. EMITTER, #1</p>               | <p><b>STYLE 3:</b><br/>         PIN 1. DRAIN, DIE #1<br/>         2. DRAIN, #1<br/>         3. DRAIN, #2<br/>         4. DRAIN, #2<br/>         5. GATE, #2<br/>         6. SOURCE, #2<br/>         7. GATE, #1<br/>         8. SOURCE, #1</p>                            | <p><b>STYLE 4:</b><br/>         PIN 1. ANODE<br/>         2. ANODE<br/>         3. ANODE<br/>         4. ANODE<br/>         5. ANODE<br/>         6. ANODE<br/>         7. ANODE<br/>         8. COMMON CATHODE</p>   |
| <p><b>STYLE 5:</b><br/>         PIN 1. DRAIN<br/>         2. DRAIN<br/>         3. DRAIN<br/>         4. DRAIN<br/>         5. GATE<br/>         6. GATE<br/>         7. SOURCE<br/>         8. SOURCE</p>   | <p><b>STYLE 6:</b><br/>         PIN 1. SOURCE<br/>         2. DRAIN<br/>         3. DRAIN<br/>         4. SOURCE<br/>         5. SOURCE<br/>         6. GATE<br/>         7. GATE<br/>         8. SOURCE</p>  | <p><b>STYLE 7:</b><br/>         PIN 1. INPUT<br/>         2. EXTERNAL BYPASS<br/>         3. THIRD STAGE SOURCE<br/>         4. GROUND<br/>         5. DRAIN<br/>         6. GATE 3<br/>         7. SECOND STAGE Vd<br/>         8. FIRST STAGE Vd</p>                    | <p><b>STYLE 8:</b><br/>         PIN 1. COLLECTOR, DIE #1<br/>         2. BASE, #1<br/>         3. BASE, #2<br/>         4. COLLECTOR, #2<br/>         5. COLLECTOR, #2<br/>         6. EMITTER, #2<br/>         7. EMITTER, #1<br/>         8. COLLECTOR, #1</p>                              |
| <p><b>STYLE 9:</b><br/>         PIN 1. EMITTER, COMMON<br/>         2. COLLECTOR, DIE #1<br/>         3. COLLECTOR, DIE #2<br/>         4. EMITTER, COMMON<br/>         5. EMITTER, COMMON<br/>         6. BASE, DIE #2<br/>         7. BASE, DIE #1<br/>         8. EMITTER, COMMON</p> | <p><b>STYLE 10:</b><br/>         PIN 1. GROUND<br/>         2. BIAS 1<br/>         3. OUTPUT<br/>         4. GROUND<br/>         5. GROUND<br/>         6. BIAS 2<br/>         7. INPUT<br/>         8. GROUND</p>  | <p><b>STYLE 11:</b><br/>         PIN 1. SOURCE 1<br/>         2. GATE 1<br/>         3. SOURCE 2<br/>         4. GATE 2<br/>         5. DRAIN 2<br/>         6. DRAIN 2<br/>         7. DRAIN 1<br/>         8. DRAIN 1</p>   | <p><b>STYLE 12:</b><br/>         PIN 1. SOURCE<br/>         2. SOURCE<br/>         3. SOURCE<br/>         4. GATE<br/>         5. DRAIN<br/>         6. DRAIN<br/>         7. DRAIN<br/>         8. DRAIN</p>   |
| <p><b>STYLE 13:</b><br/>         PIN 1. N.C.<br/>         2. SOURCE<br/>         3. SOURCE<br/>         4. GATE<br/>         5. DRAIN<br/>         6. DRAIN<br/>         7. DRAIN<br/>         8. DRAIN</p>  | <p><b>STYLE 14:</b><br/>         PIN 1. N-SOURCE<br/>         2. N-GATE<br/>         3. P-SOURCE<br/>         4. P-GATE<br/>         5. P-DRAIN<br/>         6. P-DRAIN<br/>         7. N-DRAIN<br/>         8. N-DRAIN</p>   | <p><b>STYLE 15:</b><br/>         PIN 1. ANODE 1<br/>         2. ANODE 1<br/>         3. ANODE 1<br/>         4. ANODE 1<br/>         5. CATHODE, COMMON<br/>         6. CATHODE, COMMON<br/>         7. CATHODE, COMMON<br/>         8. CATHODE, COMMON</p>               | <p><b>STYLE 16:</b><br/>         PIN 1. EMITTER, DIE #1<br/>         2. BASE, DIE #1<br/>         3. EMITTER, DIE #2<br/>         4. BASE, DIE #2<br/>         5. COLLECTOR, DIE #2<br/>         6. COLLECTOR, DIE #2<br/>         7. COLLECTOR, DIE #1<br/>         8. COLLECTOR, DIE #1</p> |
| <p><b>STYLE 17:</b><br/>         PIN 1. VCC<br/>         2. V2OUT<br/>         3. V1OUT<br/>         4. TXE<br/>         5. RXE<br/>         6. VEE<br/>         7. GND<br/>         8. ACC</p>  | <p><b>STYLE 18:</b><br/>         PIN 1. ANODE<br/>         2. ANODE<br/>         3. SOURCE<br/>         4. GATE<br/>         5. DRAIN<br/>         6. DRAIN<br/>         7. CATHODE<br/>         8. CATHODE</p>   | <p><b>STYLE 19:</b><br/>         PIN 1. SOURCE 1<br/>         2. GATE 1<br/>         3. SOURCE 2<br/>         4. GATE 2<br/>         5. DRAIN 2<br/>         6. MIRROR 2<br/>         7. DRAIN 1<br/>         8. MIRROR 1</p>   | <p><b>STYLE 20:</b><br/>         PIN 1. SOURCE (N)<br/>         2. GATE (N)<br/>         3. SOURCE (P)<br/>         4. GATE (P)<br/>         5. DRAIN<br/>         6. DRAIN<br/>         7. DRAIN<br/>         8. DRAIN</p>   |
| <p><b>STYLE 21:</b><br/>         PIN 1. CATHODE 1<br/>         2. CATHODE 2<br/>         3. CATHODE 3<br/>         4. CATHODE 4<br/>         5. CATHODE 5<br/>         6. COMMON ANODE<br/>         7. COMMON ANODE<br/>         8. CATHODE 6</p>  | <p><b>STYLE 22:</b><br/>         PIN 1. I/O LINE 1<br/>         2. COMMON CATHODE/VCC<br/>         3. COMMON CATHODE/VCC<br/>         4. I/O LINE 3<br/>         5. COMMON ANODE/GND<br/>         6. I/O LINE 4<br/>         7. I/O LINE 5<br/>         8. COMMON ANODE/GND</p> | <p><b>STYLE 23:</b><br/>         PIN 1. LINE 1 IN<br/>         2. COMMON ANODE/GND<br/>         3. COMMON ANODE/GND<br/>         4. LINE 2 IN<br/>         5. LINE 2 OUT<br/>         6. COMMON ANODE/GND<br/>         7. COMMON ANODE/GND<br/>         8. LINE 1 OUT</p> | <p><b>STYLE 24:</b><br/>         PIN 1. BASE<br/>         2. EMITTER<br/>         3. COLLECTOR/ANODE<br/>         4. COLLECTOR/ANODE<br/>         5. CATHODE<br/>         6. CATHODE<br/>         7. COLLECTOR/ANODE<br/>         8. COLLECTOR/ANODE</p>                                      |
| <p><b>STYLE 25:</b><br/>         PIN 1. VIN<br/>         2. N/C<br/>         3. REXT<br/>         4. GND<br/>         5. IOUT<br/>         6. IOUT<br/>         7. IOUT<br/>         8. IOUT</p>   | <p><b>STYLE 26:</b><br/>         PIN 1. GND<br/>         2. dv/dt<br/>         3. ENABLE<br/>         4. ILIMIT<br/>         5. SOURCE<br/>         6. SOURCE<br/>         7. SOURCE<br/>         8. VCC</p>  | <p><b>STYLE 27:</b><br/>         PIN 1. ILIMIT<br/>         2. OVLO<br/>         3. UVLO<br/>         4. INPUT+<br/>         5. SOURCE<br/>         6. SOURCE<br/>         7. SOURCE<br/>         8. DRAIN</p>  | <p><b>STYLE 28:</b><br/>         PIN 1. SW_TO_GND<br/>         2. DASIC OFF<br/>         3. DASIC_SW_DET<br/>         4. GND<br/>         5. V_MON<br/>         6. VBULK<br/>         7. VBULK<br/>         8. VIN</p>  |
| <p><b>STYLE 29:</b><br/>         PIN 1. BASE, DIE #1<br/>         2. EMITTER, #1<br/>         3. BASE, #2<br/>         4. EMITTER, #2<br/>         5. COLLECTOR, #2<br/>         6. COLLECTOR, #2<br/>         7. COLLECTOR, #1<br/>         8. COLLECTOR, #1</p>                        | <p><b>STYLE 30:</b><br/>         PIN 1. DRAIN 1<br/>         2. DRAIN 1<br/>         3. GATE 2<br/>         4. SOURCE 2<br/>         5. SOURCE 1/DRAIN 2<br/>         6. SOURCE 1/DRAIN 2<br/>         7. SOURCE 1/DRAIN 2<br/>         8. GATE 1</p>                           |   |   |

|                         |                    |   |
|-------------------------|--------------------|---|
| <b>DOCUMENT NUMBER:</b> | <b>98ASB42564B</b> | Electronic versions are uncontrolled except when accessed directly from the Document Repository.<br>Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| <b>DESCRIPTION:</b>     | <b>SOIC-8 NB</b>   | <b>PAGE 2 OF 2</b>  |

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Email Requests to: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

### TECHNICAL SUPPORT

North American Technical Support:  
Voice Mail: 1 800-282-9855 Toll Free USA/Canada  
Phone: 011 421 33 790 2910

### Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative

