

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

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

## 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)                 | Steady State                                                  | $T_A = 25^{\circ}\text{C}$ | $I_D$          | -3.3        | A                  |
|                                                                   |                                                               | $T_A = 70^{\circ}\text{C}$ |                | -2.6        |                    |
| Power Dissipation $R_{\theta JA}$ (Note 1)                        |                                                               | $T_A = 25^{\circ}\text{C}$ | $P_D$          | 1.6         | W                  |
| Continuous Drain Current $R_{\theta JA}$ (Note 2)                 |                                                               | $T_A = 25^{\circ}\text{C}$ | $I_D$          | -2.3        | A                  |
|                                                                   |                                                               | $T_A = 70^{\circ}\text{C}$ |                | -1.8        |                    |
| Power Dissipation $R_{\theta JA}$ (Note 2)                        |                                                               | $T_A = 25^{\circ}\text{C}$ | $P_D$          | 0.77        | W                  |
| Continuous Drain Current $R_{\theta JA}$ $t < 10$ s (Note 1)      |                                                               | $T_A = 25^{\circ}\text{C}$ | $I_D$          | -4.0        | A                  |
|                                                                   |                                                               | $T_A = 70^{\circ}\text{C}$ |                | -3.2        |                    |
| Power Dissipation $R_{\theta JA}$ $t < 10$ s (Note 1)             |                                                               | $T_A = 25^{\circ}\text{C}$ | $P_D$          | 2.31        | W                  |
| Pulsed Drain Current                                              | $T_A = 25^{\circ}\text{C}$ ,<br>$t_p = 10\text{ }\mu\text{s}$ |                            | $I_{DM}$       | -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)

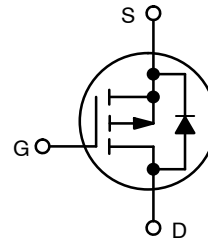
|                                             |              |           |     |   |
|---------------------------------------------|--------------|-----------|-----|---|
| Peak Repetitive Reverse Voltage             |              | $V_{RRM}$ | 20  | V |
| DC Blocking Voltage                         |              | $V_R$     | 20  | V |
| Average Rectified Forward Current, (Note 1) | Steady State | $I_F$     | 2.2 | A |
|                                             | 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     |

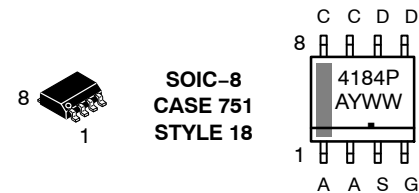


P-Channel MOSFET



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 |      |

1. Surface-mounted on FR4 board using 1 inch sq pad size, 1 oz Cu.
2. 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                         | $V_{(BR)DSS}$     | $V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$ | -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                     | $V_{GS(TH)}$     | $V_{GS} = V_{DS}, I_D = 250\text{ }\mu\text{A}$ | -1.0 |     | -3.0 | V          |
| Negative Threshold Temperature Coefficient | $V_{GS(TH)}/T_J$ |                                                 |      | 4.4 |      | mV/°C      |
| Drain-to-Source On Resistance              | $R_{DS(on)}$     | $V_{GS} = -10\text{ V}, I_D = -3.0\text{ A}$    |      | 70  | 95   | m $\Omega$ |
|                                            |                  | $V_{GS} = -4.5\text{ V}, I_D = -1.5\text{ A}$   |      | 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  | $t_{d(ON)}$  | $V_{GS} = -10\text{ V}, V_{DS} = -10\text{ V}, I_D = -1.0\text{ A}, R_G = 6.0\text{ }\Omega$ |  | 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  |      |    |
| Reverse Recovery Time | $t_{RR}$ | $V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, I_S = -1.3\text{ A}$ |                           | 12.8 |      |      | ns |
| Charge Time           | $t_a$    |                                                                                |                           | 10   |      |      |    |
| Discharge Time        | $t_b$    |                                                                                |                           | 2.8  |      |      |    |
| Reverse Recovery Time | $Q_{RR}$ |                                                                                |                           | 7.4  |      |      | nC |

# NTMD4184PF

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

| 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   |      |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

4. Switching characteristics are independent of operating junction temperatures.

## TYPICAL CHARACTERISTICS

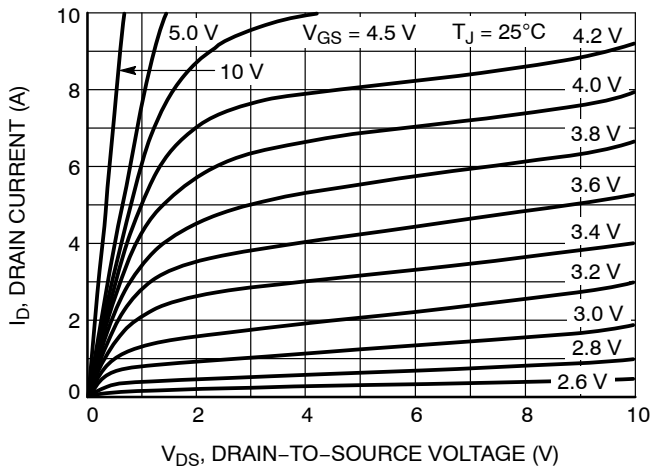


Figure 1. On-Region Characteristics

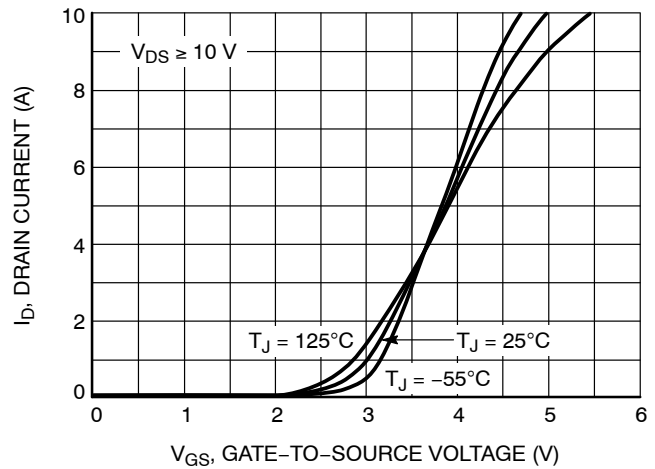


Figure 2. Transfer Characteristics

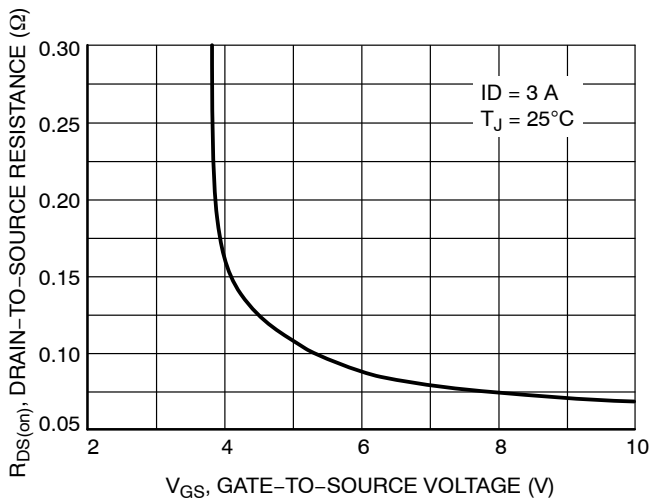


Figure 3. On-Resistance vs. Gate Voltage

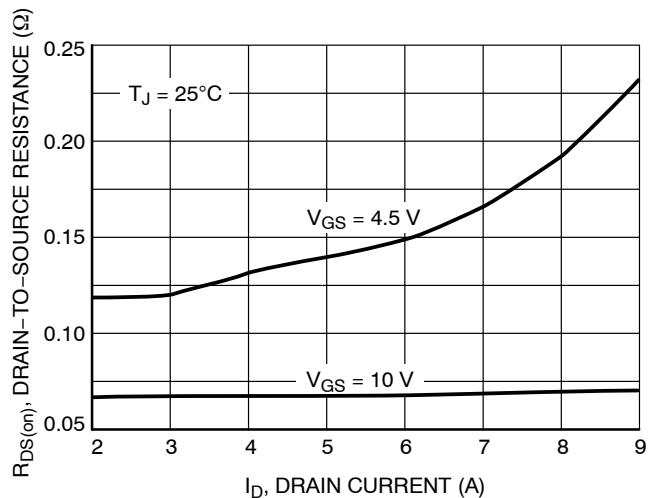


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

TYPICAL CHARACTERISTICS (CONTINUED)

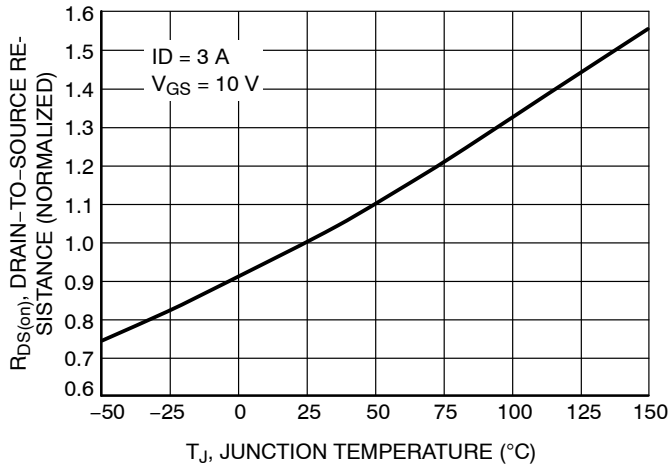


Figure 5. On-Resistance Variation with Temperature

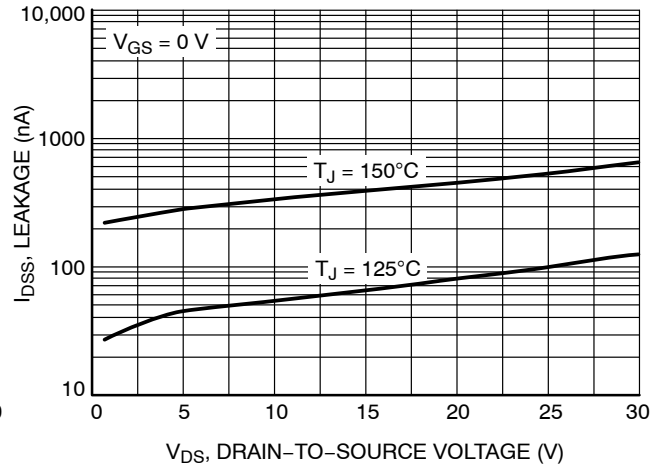


Figure 6. Drain-to-Source Leakage Current vs. Voltage

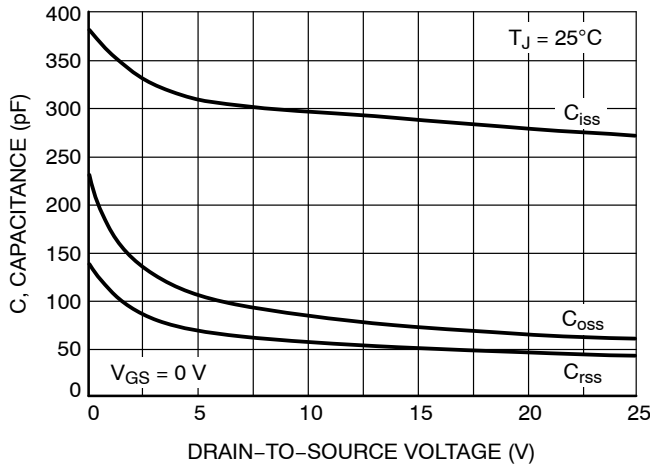


Figure 7. Capacitance Variation

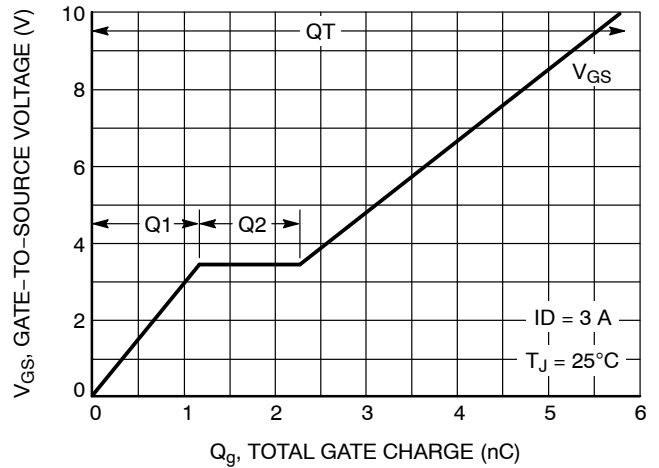


Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

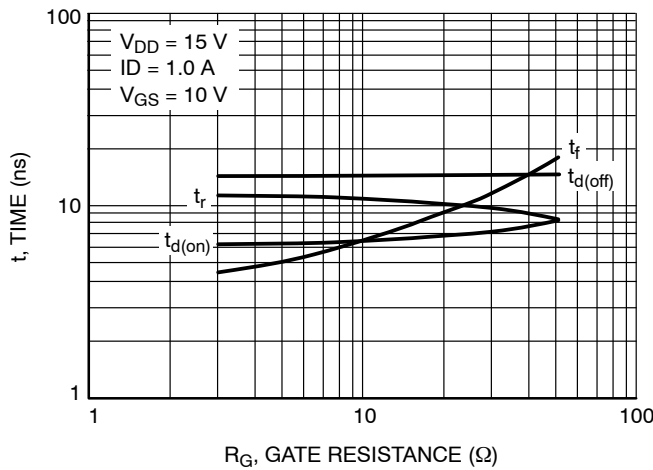


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

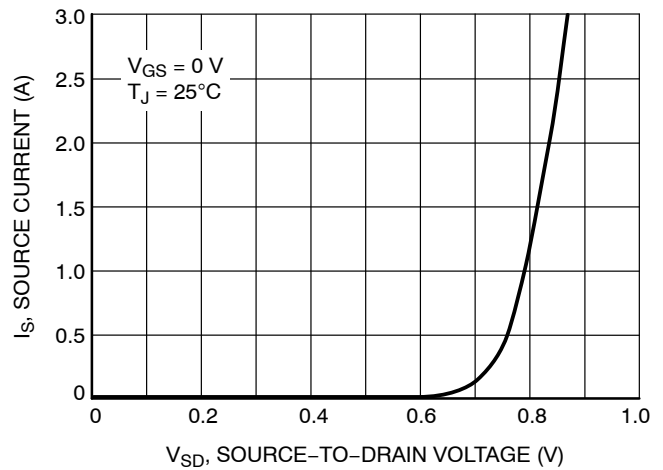


Figure 10. Diode Forward Voltage vs. Current

TYPICAL CHARACTERISTICS (CONTINUED)

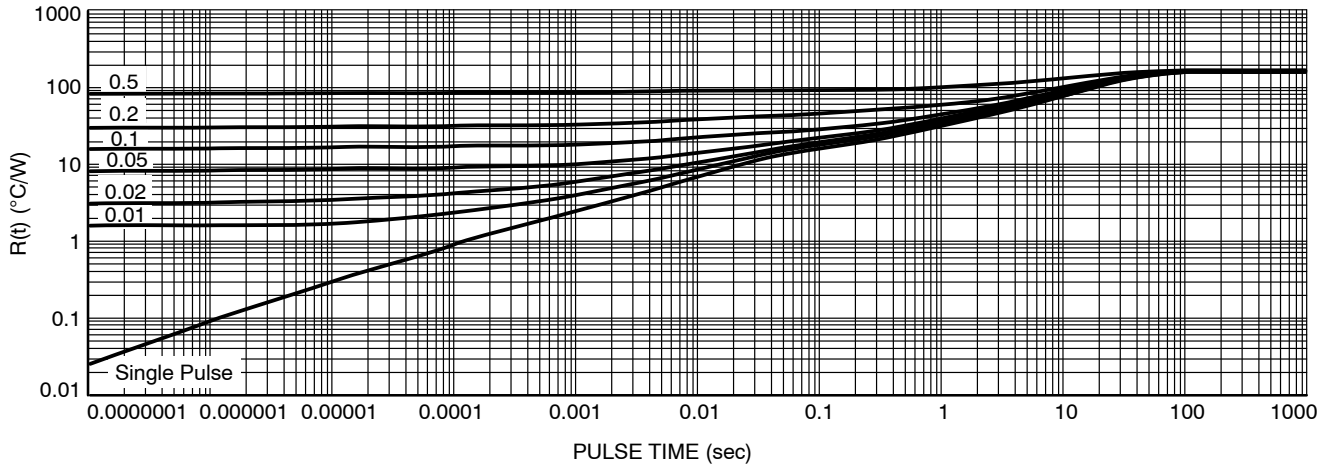


Figure 11. Thermal Response –  $R_{\theta JA}$  at Steady State (min pad)

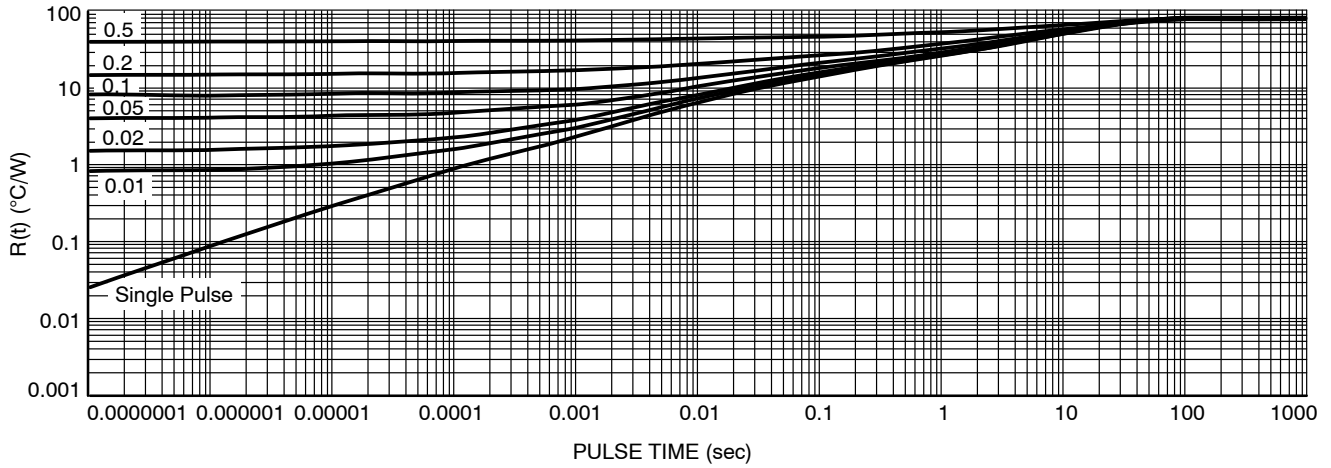


Figure 12. Thermal Response –  $R_{\theta JA}$  at Steady State (1 inch sq pad)

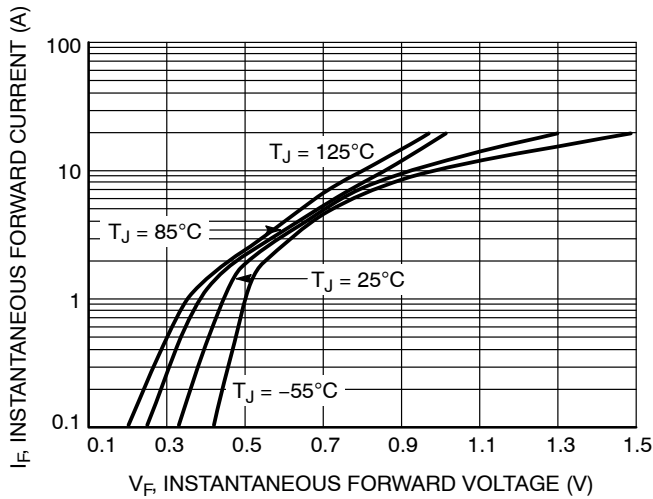


Figure 13. Typical Forward Voltage

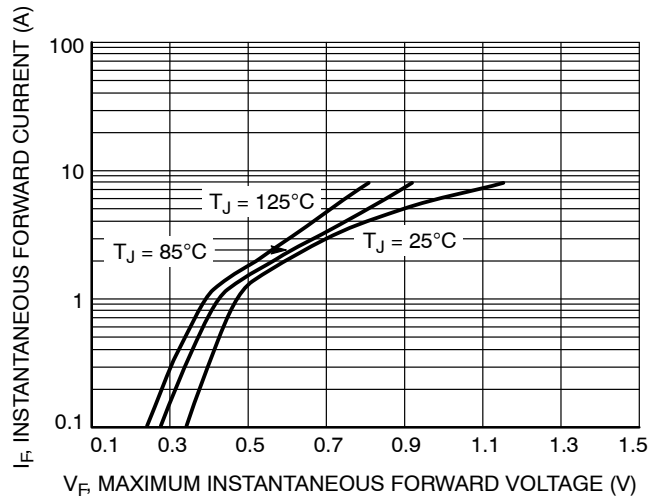


Figure 14. Maximum Forward Voltage

TYPICAL CHARACTERISTICS (CONTINUED)

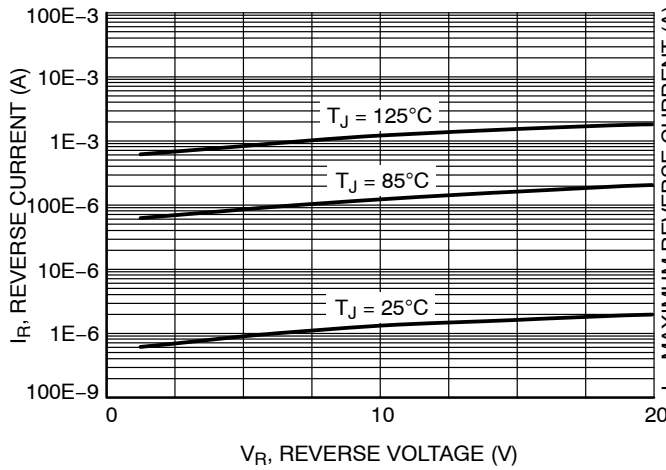


Figure 15. Typical Reverse Current

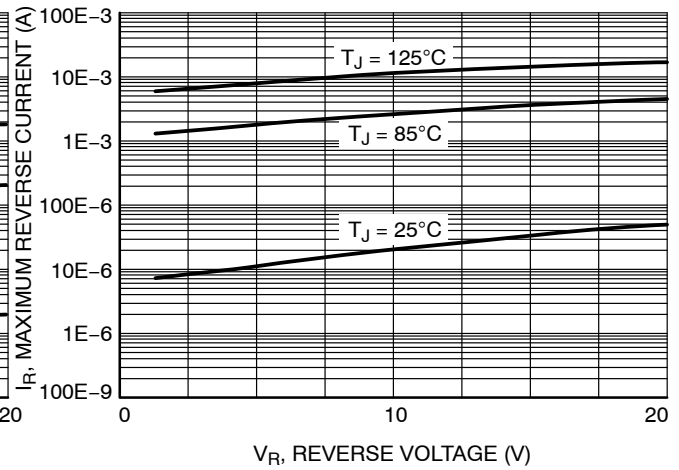


Figure 16. Maximum Reverse Current

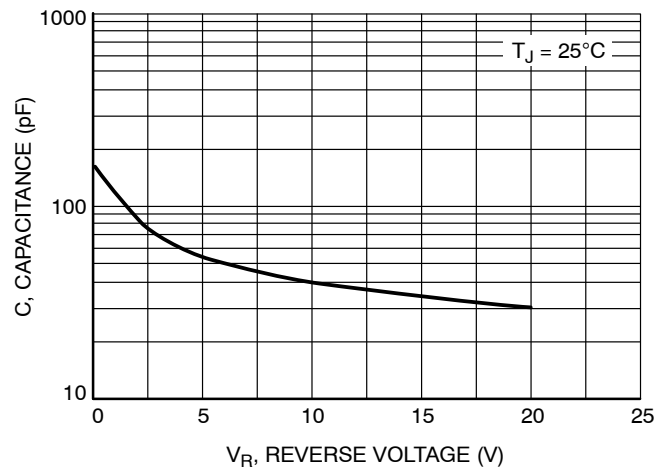
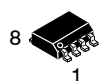


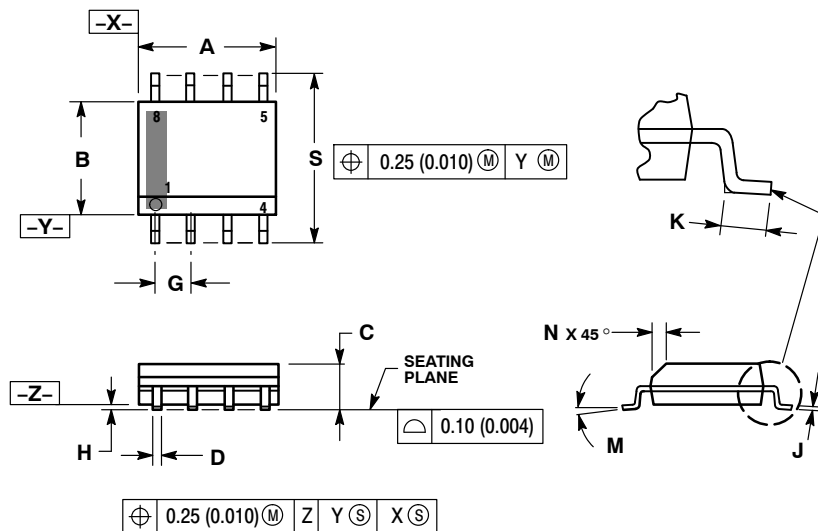
Figure 17. Capacitance



SCALE 1:1

SOIC-8 NB  
CASE 751-07  
ISSUE AK

DATE 16 FEB 2011

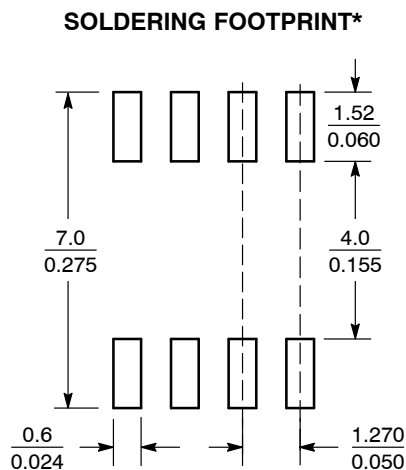


NOTES:

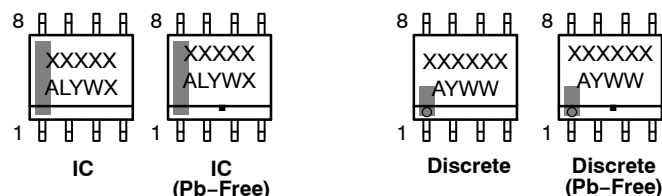
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL 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\*



SCALE 6:1 (mm/inches)



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 **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

|                  |             |                                                                                                                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | SOIC-8 NB   | PAGE 1 OF 2                                                                                                                                                                         |

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**CASE 751-07**  
**ISSUE AK**

DATE 16 FEB 2011

|                                                                                                                                                                                                   |                                                                                                                                                                                          |                                                                                                                                                                                    |                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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                                                                 | <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               | <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                            | <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                                                                           |
| <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                                                                               | <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                                                                    | <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                    | <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                              |
| <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 | <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                                                              | <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                                               | <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                                                                                 |
| <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                                                                              | <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                                                     | <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               | <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 |
| <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                                                                                          | <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                                                                 | <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                                             | <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                                                                   |
| <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                                        | <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 | <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 | <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                                      |
| <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                                                                                         | <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                                                                    | <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                                                            | <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                                                                        |
| <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                        | <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                           |                                                                                                                                                                                    |                                                                                                                                                                                                        |

|                         |                    |                                                                                                                                                                                     |
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