

NTMFS6H836N

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

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------|---|---------------------------|-----|-----|----------------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$ | 80 | | | V |
| Drain-to-Source Breakdown Voltage Temperature Coefficient | $V_{(BR)DSS}/T_J$ | | | 39 | | mV/ $^\circ\text{C}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{GS} = 0\text{ V}, V_{DS} = 80\text{ V}$ | $T_J = 25^\circ\text{C}$ | | 10 | μA |
| | | | $T_J = 125^\circ\text{C}$ | | 100 | |
| Gate-to-Source Leakage Current | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = 20\text{ V}$ | | | 100 | nA |

ON CHARACTERISTICS (Note 4)

| | | | | | | |
|-----------------------------------|------------------|---|-----|------|------|----------------------|
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS} = V_{DS}, I_D = 95\ \mu\text{A}$ | 2.0 | | 4.0 | V |
| Threshold Temperature Coefficient | $V_{GS(TH)}/T_J$ | | | -7.3 | | mV/ $^\circ\text{C}$ |
| Drain-to-Source On Resistance | $R_{DS(on)}$ | $V_{GS} = 10\text{ V}, I_D = 15\text{ A}$ | | 5.6 | 6.7 | m Ω |
| | | $V_{GS} = 6\text{ V}, I_D = 15\text{ A}$ | | 8.2 | 11.4 | |
| Forward Transconductance | g_{FS} | $V_{DS} = 15\text{ V}, I_D = 25\text{ A}$ | | 97 | | S |

CHARGES, CAPACITANCES & GATE RESISTANCE

| | | | | | | |
|------------------------------|--------------|---|--|------|--|----|
| Input Capacitance | C_{ISS} | $V_{GS} = 0\text{ V}, f = 1\text{ MHz}, V_{DS} = 40\text{ V}$ | | 1640 | | pF |
| Output Capacitance | C_{OSS} | | | 230 | | |
| Reverse Transfer Capacitance | C_{RSS} | | | 8.0 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 40\text{ V}; I_D = 25\text{ A}$ | | 25 | | nC |
| Threshold Gate Charge | $Q_{G(TH)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 40\text{ V}; I_D = 25\text{ A}$ | | 5.2 | | |
| Gate-to-Source Charge | Q_{GS} | | | 8.5 | | |
| Gate-to-Drain Charge | Q_{GD} | | | 4.3 | | |
| Plateau Voltage | V_{GP} | | | 4.9 | | |

SWITCHING CHARACTERISTICS (Note 5)

| | | | | | | |
|---------------------|--------------|--|--|----|--|----|
| Turn-On Delay Time | $t_{d(ON)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 64\text{ V}, I_D = 25\text{ A}, R_G = 2.5\ \Omega$ | | 16 | | ns |
| Rise Time | t_r | | | 45 | | |
| Turn-Off Delay Time | $t_{d(OFF)}$ | | | 41 | | |
| Fall Time | t_f | | | 34 | | |

DRAIN-SOURCE DIODE CHARACTERISTICS

| | | | | | | | |
|-------------------------|----------|--|---------------------------|----|-----|-----|----|
| Forward Diode Voltage | V_{SD} | $V_{GS} = 0\text{ V}, I_S = 15\text{ A}$ | $T_J = 25^\circ\text{C}$ | | 0.8 | 1.2 | V |
| | | | $T_J = 125^\circ\text{C}$ | | 0.7 | | |
| Reverse Recovery Time | t_{RR} | $V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, I_S = 25\text{ A}$ | | 43 | | ns | |
| Charge Time | t_a | | | 29 | | | |
| Discharge Time | t_b | | | 15 | | | |
| Reverse Recovery Charge | Q_{RR} | | | 54 | | | nC |

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.

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

5. Switching characteristics are independent of operating junction temperatures.

NTMFS6H836N

TYPICAL CHARACTERISTICS

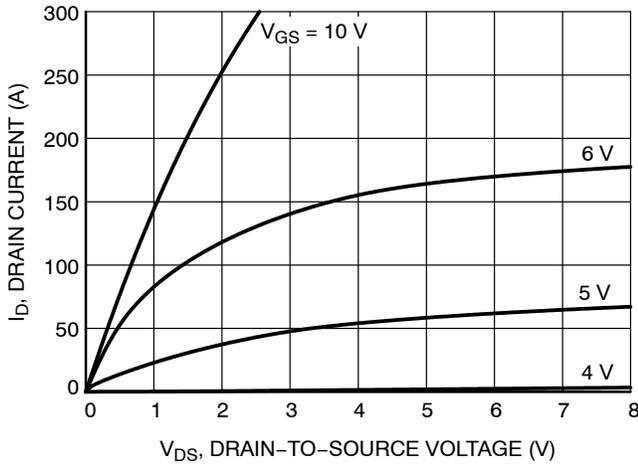


Figure 1. On-Region Characteristics

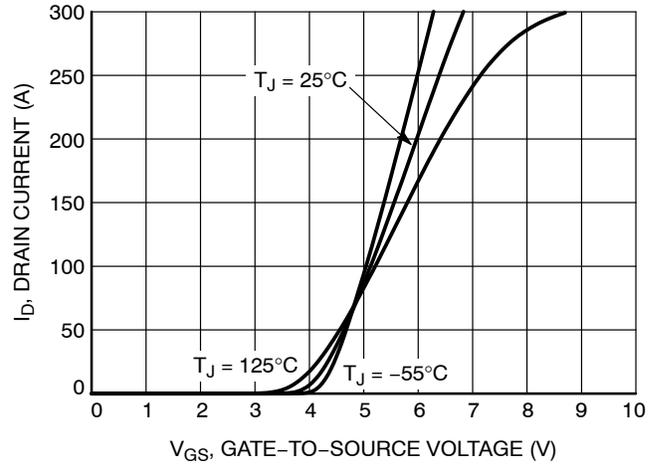


Figure 2. Transfer Characteristics

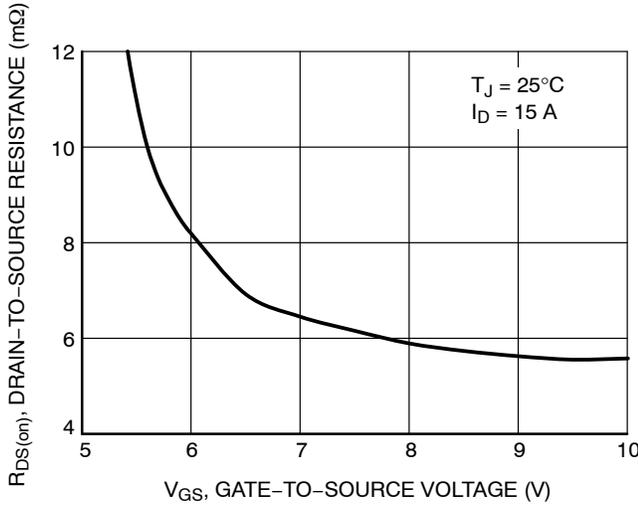


Figure 3. On-Resistance vs. Gate-to-Source Voltage

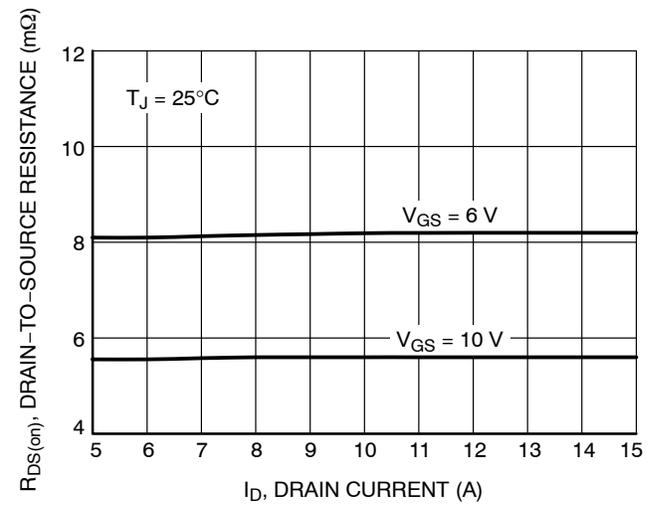


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

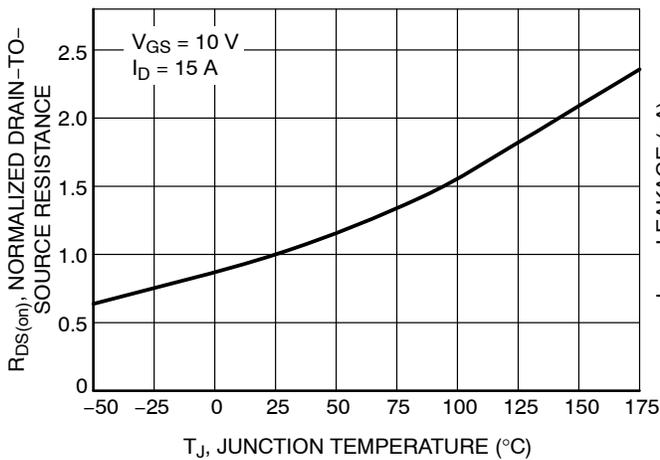


Figure 5. On-Resistance Variation with Temperature

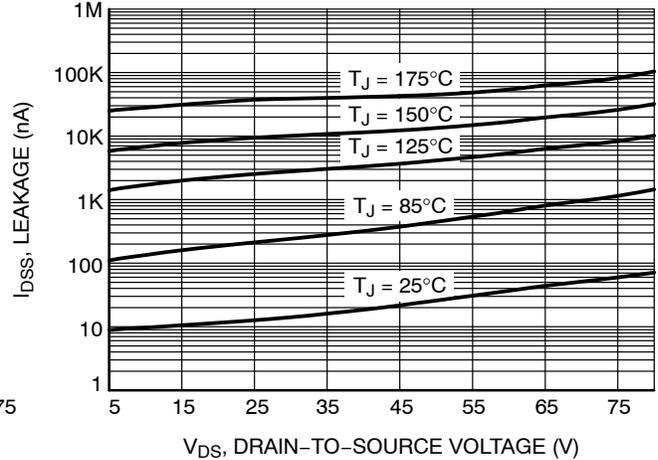


Figure 6. Drain-to-Source Leakage Current vs. Voltage

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TYPICAL CHARACTERISTICS

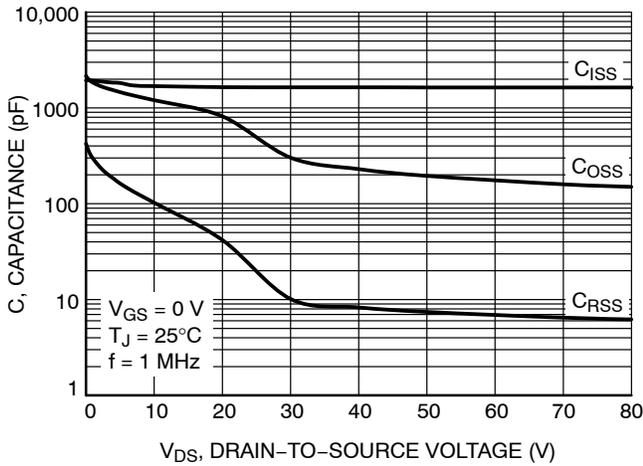


Figure 7. Capacitance Variation

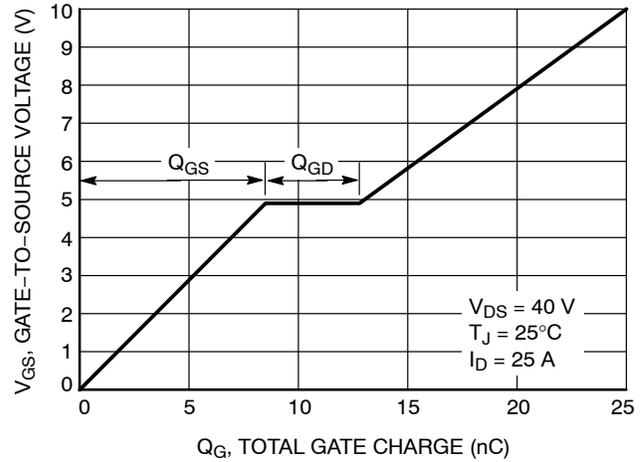


Figure 8. Gate-to-Source Voltage vs. Total Charge

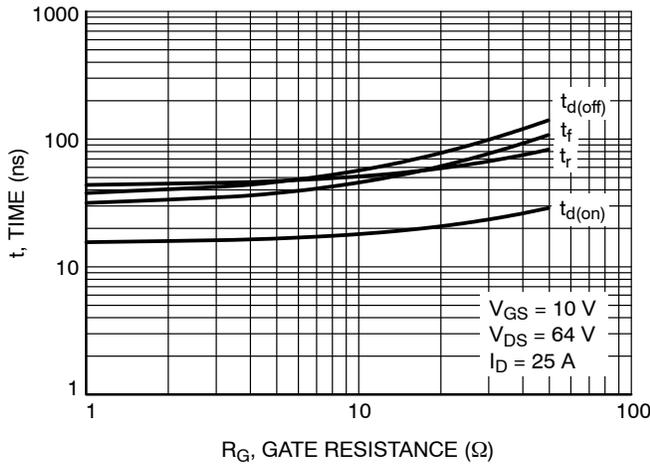


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

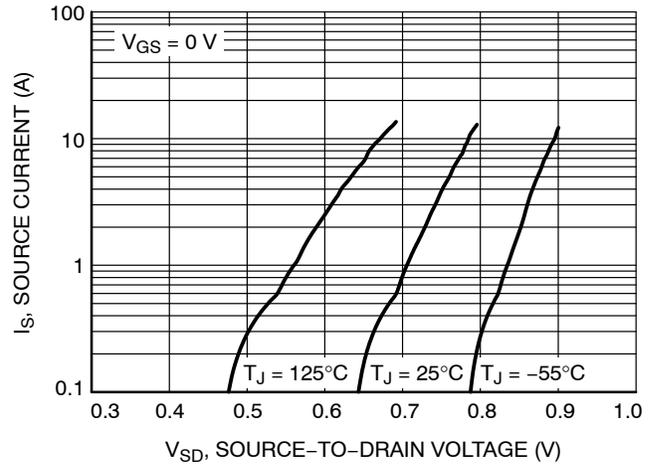


Figure 10. Diode Forward Voltage vs. Current

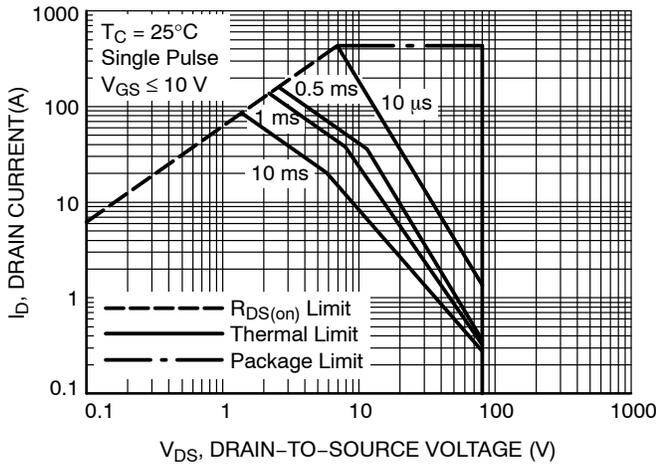


Figure 11. Maximum Rated Forward Biased Safe Operating Area

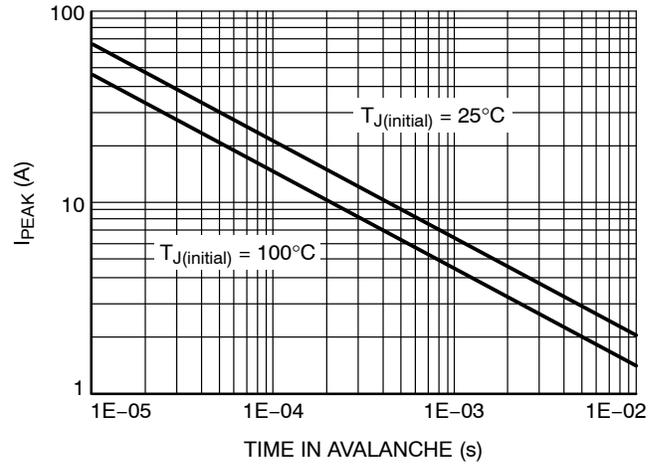


Figure 12. I_{PEAK} vs. Time in Avalanche

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TYPICAL CHARACTERISTICS

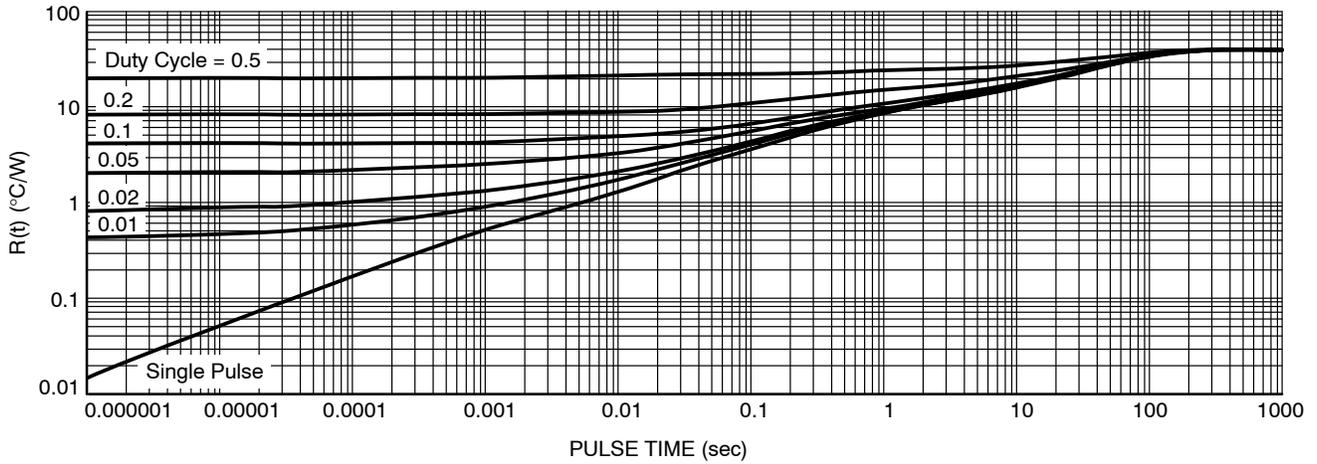


Figure 13. Thermal Characteristics

DEVICE ORDERING INFORMATION

| Device | Marking | Package | Shipping [†] |
|----------------|---------|-------------------|-----------------------|
| NTMFS6H836NT1G | 6H836N | DFN5 (Pb-Free) | 1500 / 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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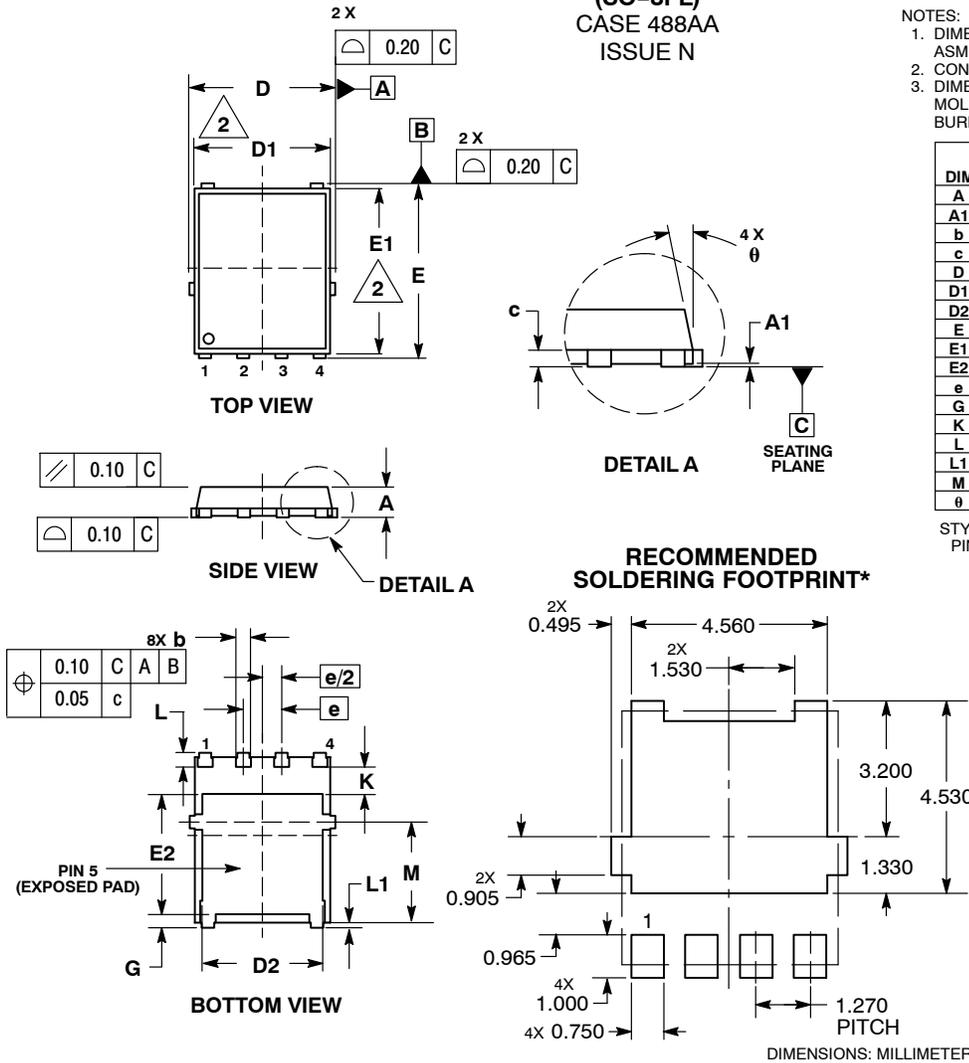
PACKAGE DIMENSIONS

DFN5 5x6, 1.27P
(SO-8FL)
CASE 488AA
ISSUE N

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| DIM | MILLIMETERS | | |
|-----|-------------|-------|------|
| | MIN | NOM | MAX |
| A | 0.90 | 1.00 | 1.10 |
| A1 | 0.00 | --- | 0.05 |
| b | 0.33 | 0.41 | 0.51 |
| c | 0.23 | 0.28 | 0.33 |
| D | 5.00 | 5.15 | 5.30 |
| D1 | 4.70 | 4.90 | 5.10 |
| D2 | 3.80 | 4.00 | 4.20 |
| E | 6.00 | 6.15 | 6.30 |
| E1 | 5.70 | 5.90 | 6.10 |
| E2 | 3.45 | 3.65 | 3.85 |
| e | 1.27 BSC | | |
| G | 0.51 | 0.575 | 0.71 |
| K | 1.20 | 1.35 | 1.50 |
| L | 0.51 | 0.575 | 0.71 |
| L1 | 0.125 REF | | |
| M | 3.00 | 3.40 | 3.80 |
| θ | 0° | --- | 12° |

- STYLE 1:
PIN 1. SOURCE
2. SOURCE
3. SOURCE
4. GATE
5. DRAIN



*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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