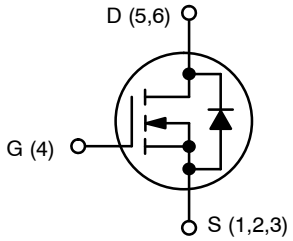
# MOSFET – Power, Single N-Channel
## 100 V, 14 mΩ, 46 A

# NVMFS016N10MCL

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|---|---|---|
| 100 V | 14 mΩ @ 10 V | 46 A |
| | 20 mΩ @ 4.5 V | |

### Features
- Small Footprint (5x6 mm) for Compact Design
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low $Q_G$ and Capacitance to Minimize Driver Losses
- AEC−Q101 Qualified and PPAP Capable
- NVMFWS016N10MCL – Wettable Flank Products
- These Devices are Pb−Free, Halogen Free/BFR Free, Beryllium Free and are RoHS Compliant




**N−CHANNEL MOSFET**

### MAXIMUM RATINGS ($T_J$ = 25°C unless otherwise noted)

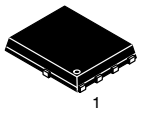
| Parameter | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain−to−Source Voltage | | | $V_{DSS}$ | 100 | V |
| Gate−to−Source Voltage | | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current $R_{\theta JC}$ (Note 1) | Steady State | $T_C$ = 25°C | $I_D$ | 46 | A |
| | | $T_C$ = 100°C | | 32 | |
| Power Dissipation $R_{\theta JC}$ (Note 1) | | $T_C$ = 25°C | $P_D$ | 64 | W |
| | | $T_C$ = 100°C | | 32 | |
| Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2) | Steady State | $T_A$ = 25°C | $I_D$ | 10.9 | A |
| | | $T_A$ = 100°C | | 7.7 | |
| Power Dissipation $R_{\theta JA}$ (Notes 1, 2) | | $T_A$ = 25°C | $P_D$ | 3.6 | W |
| | | $T_A$ = 100°C | | 1.8 | |
| Pulsed Drain Current | $T_A$ = 25°C, $t_p$ = 10 μs | | $I_{DM}$ | 243 | A |
| Operating Junction and Storage Temperature Range | | | $T_J$, $T_{stg}$ | −55 to +175 | °C |
| Source Current (Body Diode) | | | $I_S$ | 49 | A |
| Single Pulse Drain−to−Source Avalanche Energy ($I_{L(pk)}$ = 2.2 A) | | | $E_{AS}$ | 358 | mJ |
| Lead Temperature Soldering Reflow for Soldering Purposes (1/8″ from case for 10 s) | | | $T_L$ | 260 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

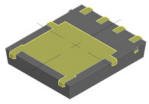
### THERMAL RESISTANCE RATINGS

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction−to−Case – Steady State (Note 1) | $R_{\theta JC}$ | 2.35 | °C/W |
| Junction−to−Ambient – Steady State (Note 2) | $R_{\theta JA}$ | 41 | |

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Surface−mounted on FR4 board using 1 $in^2$ pad size, 1 oz. Cu pad.

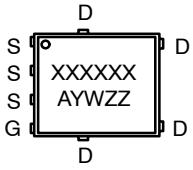


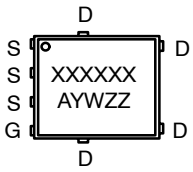
**DFN5**
**CASE 488AA**
**STYLE 1**



**DFNW5**
**(for WF Version)**
**CASE 507BA**

### MARKING DIAGRAM




XXXXXX = Specific Device Code
A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

### ORDERING INFORMATION
See detailed ordering, marking and shipping information on page 5 of this data sheet.

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**ELECTRICAL CHARACTERISTICS** ($T_J$ = 25°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 V, $I_D$ = 250 μA | | 100 | | | V |
| Drain−to−Source Breakdown Voltage Temperature Coefficient | $V_{(BR)DSS}/T_J$ | $I_D$ = 250 μA, ref to 25°C | | | 60 | | mV/°C |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 100 V | $T_J$ = 25°C | | | 1 | μA |
| | | | $T_J$ = 125°C | | | 100 | |
| Gate−to−Source Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = 20 V | | | | 100 | nA |
| **ON CHARACTERISTICS** | | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 64 μA | | 1 | | 3 | V |
| Threshold Temperature Coefficient | $V_{GS(TH)}/T_J$ | $I_D$ = 250 μA, ref to 25°C | | | −5.6 | | mV/°C |
| Drain−to−Source On Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 11 A | | | 11.5 | 14 | mΩ |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 9 A | | | 16 | 20 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 10 V, $I_D$ = 11 A | | | 42 | | S |
| Gate−Resistance | $R_G$ | $T_A$ = 25°C | | | 1.2 | | Ω |
| **CHARGES & CAPACITANCES** | | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{GS}$ = 0 V, f = 1 MHz, $V_{DS}$ = 50 V | | | 1250 | | pF |
| Output Capacitance | $C_{OSS}$ | | | | 460 | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | | 8 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ = 4.5 V, $V_{DS}$ = 50 V, $I_D$ = 9 A | | | 9.0 | | nC |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 50 V, $I_D$ = 11 A | | | 19 | | |
| Threshold Gate Charge | $Q_{G(TH)}$ | | | | 2.1 | | |
| Gate−to−Source Charge | $Q_{GS}$ | | | | 3.7 | | |
| Gate−to−Drain Charge | $Q_{GD}$ | | | | 2.0 | | |
| Plateau Voltage | $V_{GP}$ | | | | 2.8 | | V |
| **SWITCHING CHARACTERISTICS** (Note 3) | | | | | | | |
| Turn−On Delay Time | $t_{d(ON)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 50 V, $I_D$ = 11 A, $R_G$ = 6 Ω | | | 10 | | ns |
| Rise Time | $t_r$ | | | | 3.4 | | |
| Turn−Off Delay Time | $t_{d(OFF)}$ | | | | 26 | | |
| Fall Time | $t_f$ | | | | 4.2 | | |
| **DRAIN−SOURCE DIODE CHARACTERISTICS** | | | | | | | |
| Forward Diode Voltage | $V_{SD}$ | $V_{GS}$ = 0 V, $I_S$ = 11 A | $T_J$ = 25°C | | 0.84 | 1.3 | V |
| | | | $T_J$ = 125°C | | 0.72 | | |
| Reverse Recovery Time | $t_{RR}$ | $V_{GS}$ = 0 V, $dI_S/dt$ = 100 A/μs, $I_S$ = 6 A | | | 34 | | ns |
| Reverse Recovery Charge | $Q_{RR}$ | | | | 24 | | nC |
| Charge Time | $t_a$ | | | | 16 | | ns |
| Discharge Time | $t_b$ | | | | 17 | | ns |

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. Switching characteristics are independent of operating junction temperatures

## TYPICAL CHARACTERISTICS

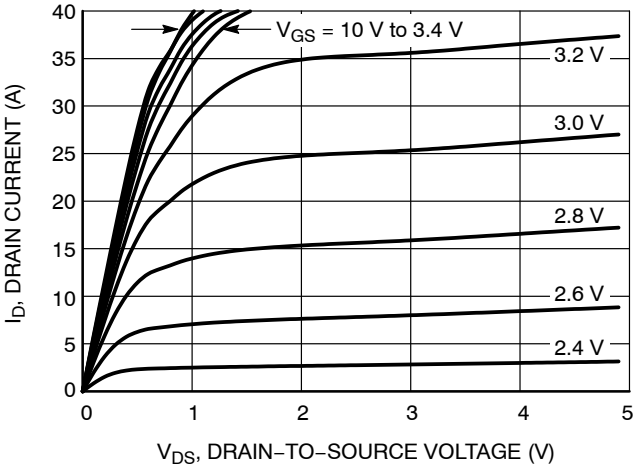



**Figure 1. On−Region Characteristics**

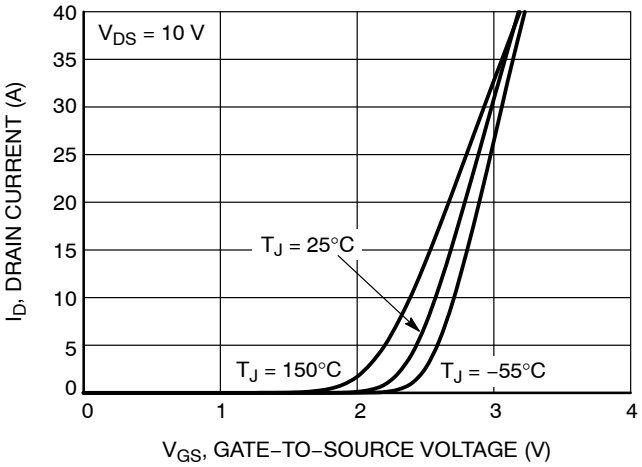



**Figure 2. Transfer Characteristics**

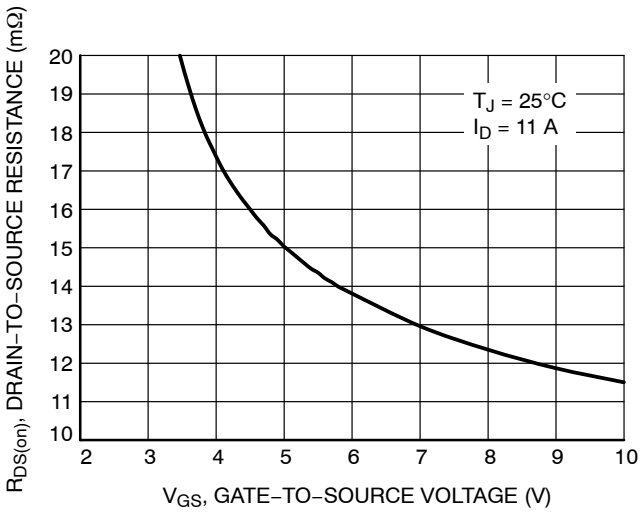



**Figure 3. On−Resistance vs. Gate−to−Source Voltage**

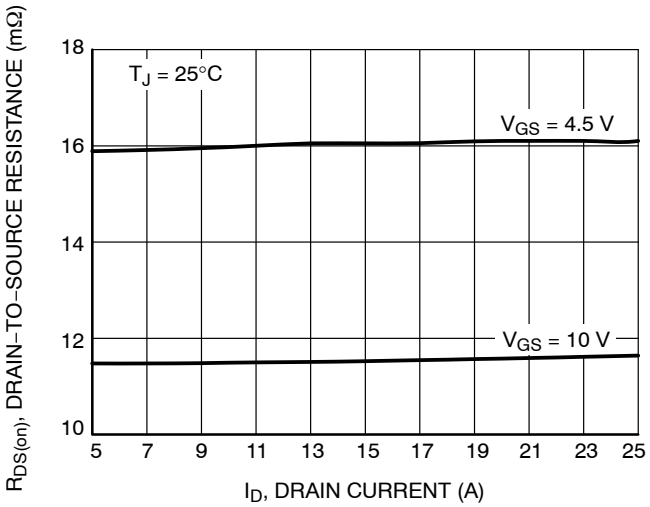



**Figure 4. On−Resistance vs. Drain Current and Gate Voltage**

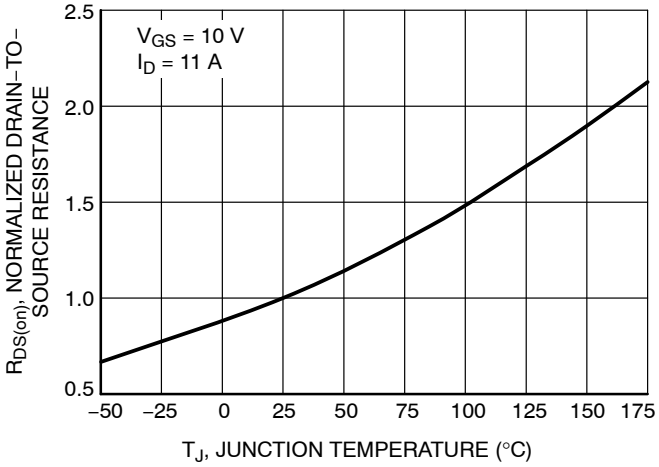



**Figure 5. On−Resistance Variation with Temperature**

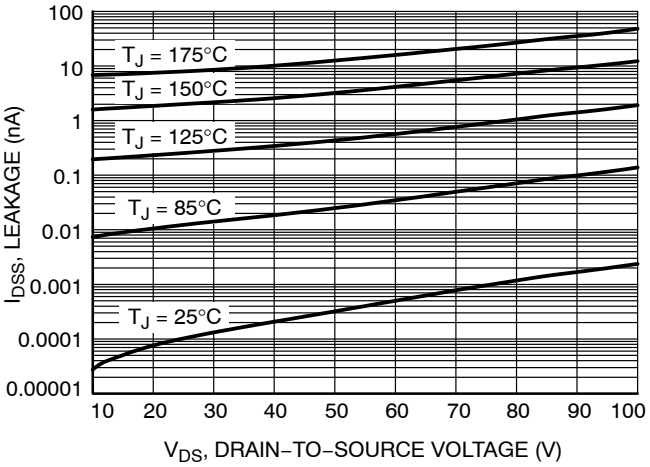



**Figure 6. Drain−to−Source Leakage Current vs. Voltage**

## TYPICAL CHARACTERISTICS

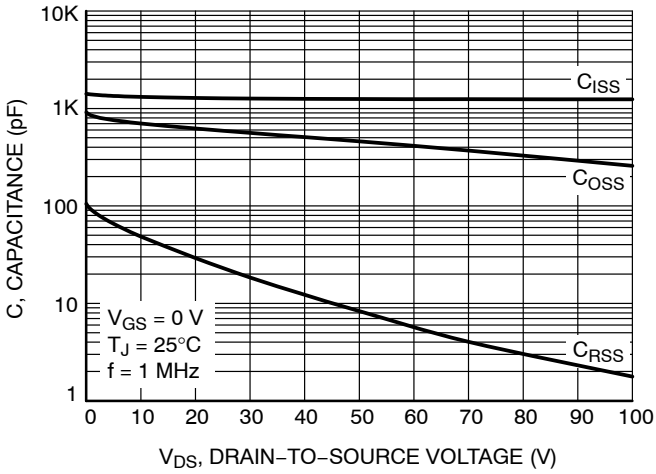



**Figure 7. Capacitance Variation**

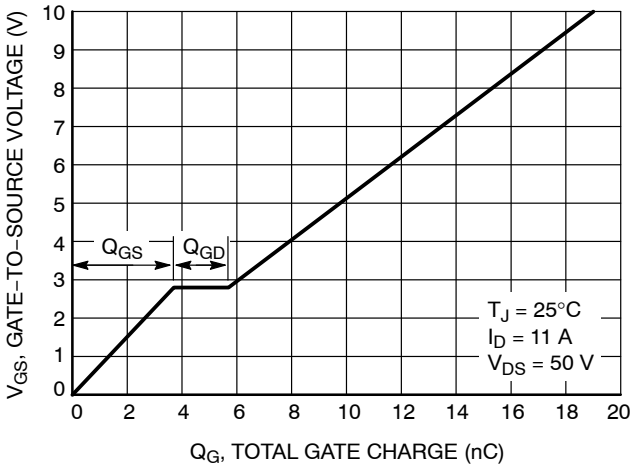



**Figure 8. Gate−to−Source Voltage vs. Total Charge**

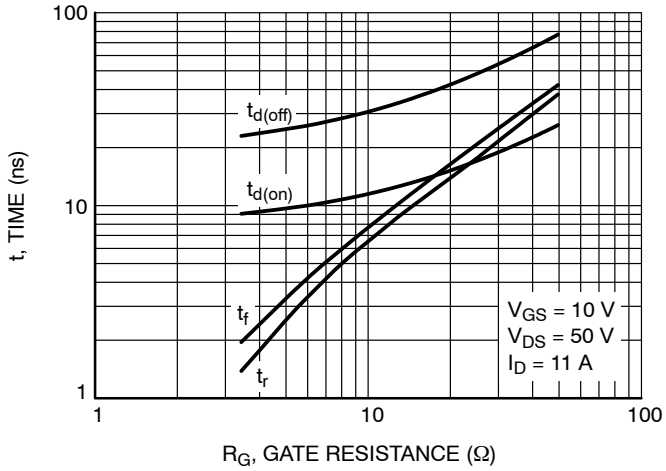



**Figure 9. Resistive Switching Time Variation vs. Gate Resistance**

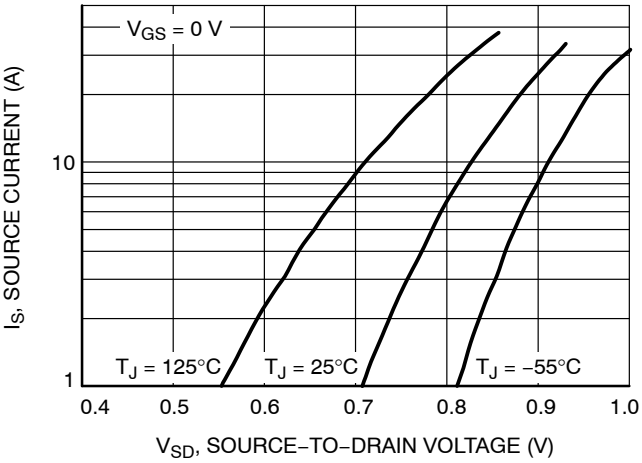



**Figure 10. Diode Forward Voltage vs. Current**

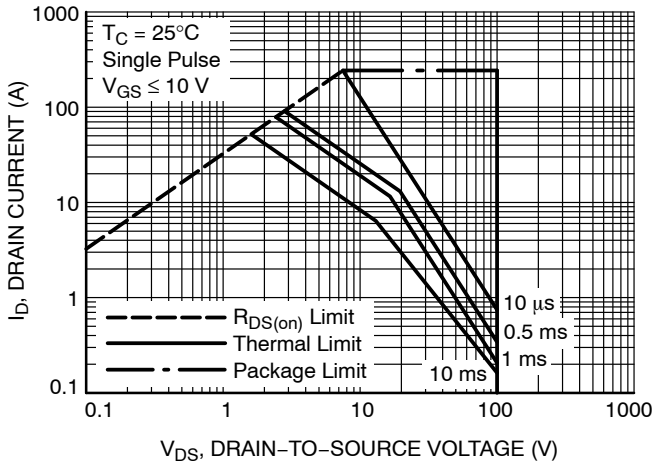



**Figure 11. Maximum Rated Forward Biased Safe Operating Area**

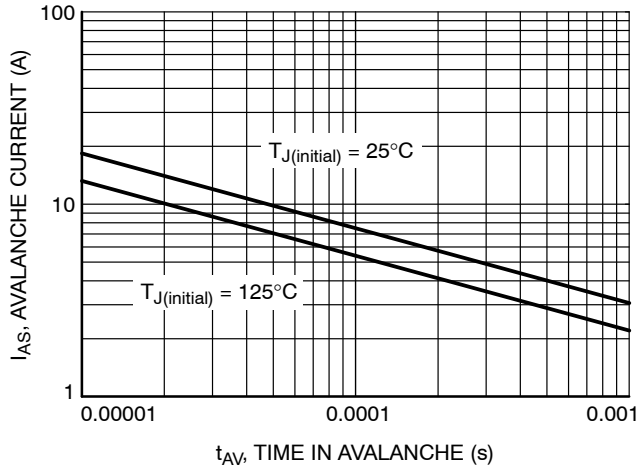



**Figure 12. Maximum Drain Current vs. Time in Avalanche**

## TYPICAL CHARACTERISTICS

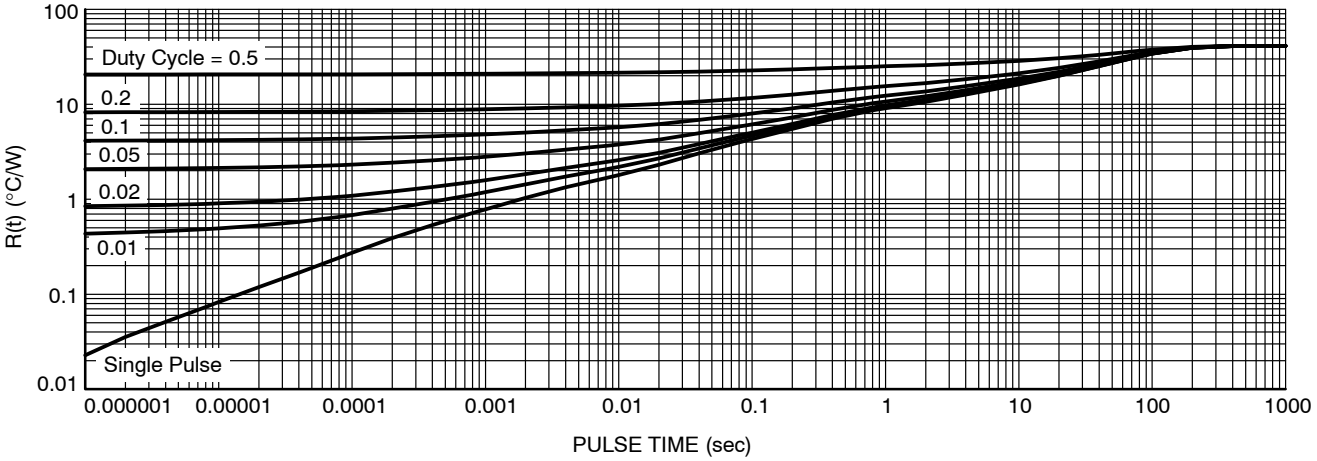



**Figure 13. Transient Thermal Impedance**

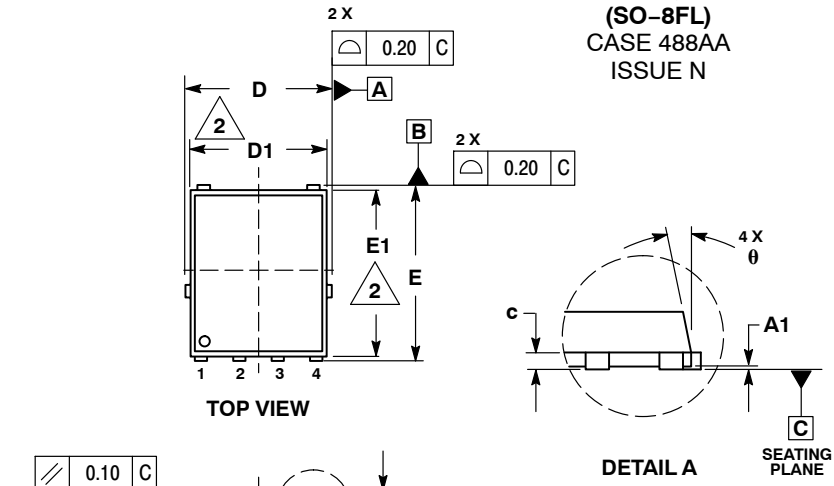
### DEVICE ORDERING INFORMATION

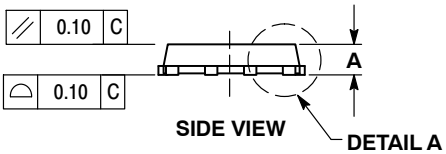
| Device | Marking | Package | Shipping† |
|---|---|---|---|
| NVMFS016N10MCLT1G | 016L10 | DFN5<br>(Pb−Free) | 1500 / Tape & Reel |
| NVMFWS016N10MCLT1G | 016W10 | DFN5<br>(Wettable Flank, Pb−Free) | 1500 / Tape & Reel |

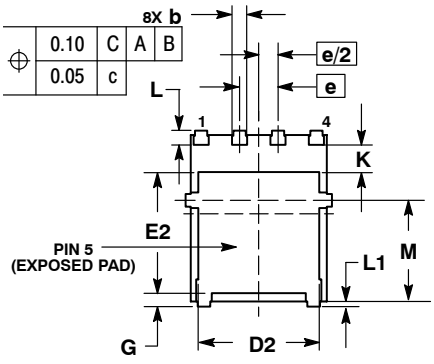
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

## PACKAGE DIMENSIONS

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



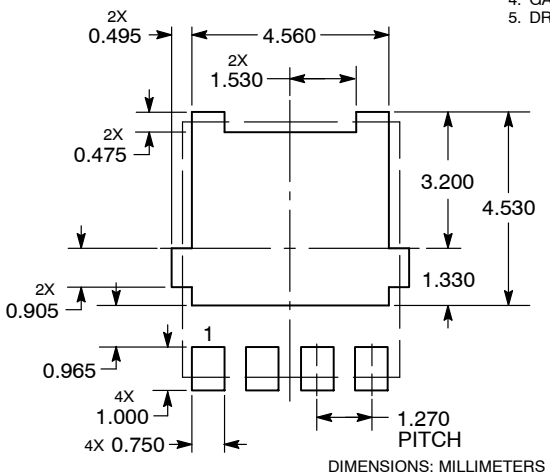




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| | MILLIMETERS | | |
|---|---|---|---|
| DIM | 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

**RECOMMENDED SOLDERING FOOTPRINT***

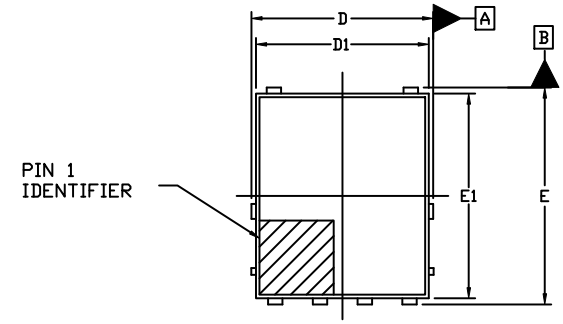


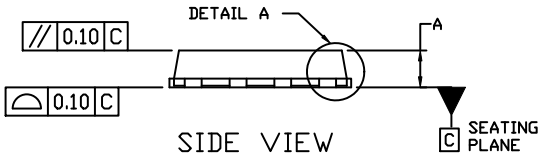

DIMENSIONS: MILLIMETERS

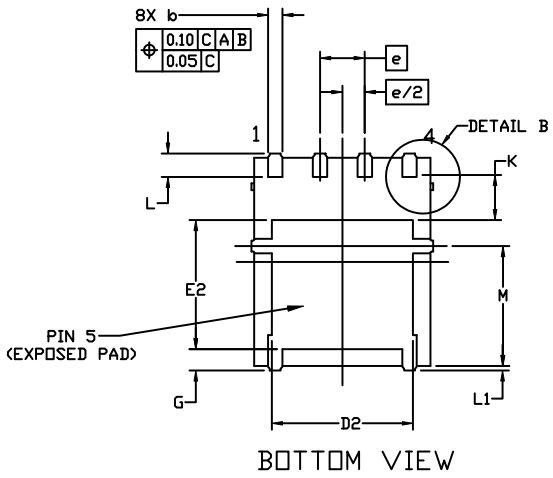
*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

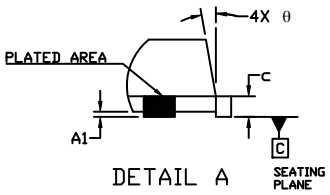
## PACKAGE DIMENSIONS

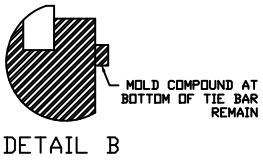
**DFNW5 5x6 (FULL−CUT SO8FL WF)**
CASE 507BA
ISSUE A



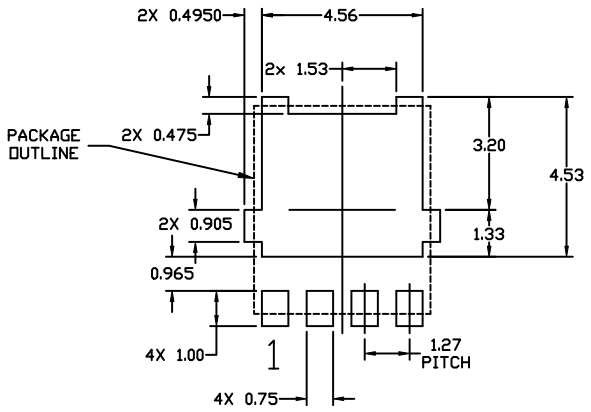




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
4. THIS PACKAGE CONTAINS WETTABLE FLANK DESIGN FEATURES TO AID IN FILLET FORMATION ON THE LEADS DURING MOUNTING.

| | MILLIMETERS | | |
|---|---|---|---|
| DIM | 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 | 0.150 REF | | |
| M | 3.00 | 3.40 | 3.80 |
| θ | 0° | --- | 12° |




RECOMMENDED
MOUNTING FOOTPRINT

* 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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Phone: 00421 33 790 2910
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# Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

### Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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### Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

**Kategorilere göz atın**

### Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

**Üreticileri görün**

### Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

**Teklif isteyin**

**www.entegreci.com** | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.