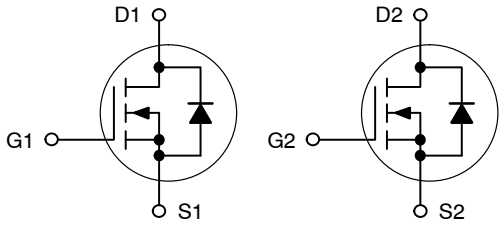
# MOSFET - Power, Dual N-Channel, Logic Level, Dual SO8FL
## 60 V, 39 mΩ, 17 A

# NVMFD5877NL

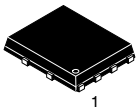
| $V_{(BR)DSS}$ | $R_{DS(on)}$ MAX | $I_D$ MAX |
|---|---|---|
| 60 V | 39 mΩ @ 10 V | 17 A |
| | 60 mΩ @ 4.5 V | |

**Dual N-Channel**



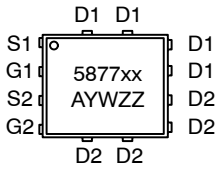

### Features

- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- NVMFD5877NLWF – Wettable Flanks Option for Enhanced Optical Inspection
- AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant




**DFN8 5x6**
**(SO8FL)**
**CASE 506BT**

### MARKING DIAGRAM




5877NL = Specific Device Code for NVMFD5877NL
5877LW = Specific Device Code for NVMFD5877NLWF
A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

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

| Parameter | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-to-Source Voltage | | | $V_{DSS}$ | 60 | V |
| Gate-to-Source Voltage | | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current $R_{\Psi J-mb}$ (Notes 1, 2, 3, 4) | Steady State | $T_{mb}$ = 25 °C | $I_D$ | 17 | A |
| | | $T_{mb}$ = 100 °C | | 12 | |
| Power Dissipation $R_{\Psi J-mb}$ (Notes 1, 2, 3) | | $T_{mb}$ = 25 °C | $P_D$ | 23 | W |
| | | $T_{mb}$ = 100 °C | | 12 | |
| Continuous Drain Current $R_{\theta JA}$ (Notes 1 & 3, 4) | Steady State | $T_A$ = 25 °C | $I_D$ | 6 | A |
| | | $T_A$ = 100 °C | | 5 | |
| Power Dissipation $R_{\theta JA}$ (Notes 1, 3) | | $T_A$ = 25 °C | $P_D$ | 3.2 | W |
| | | $T_A$ = 100°C | | 1.6 | |
| Pulsed Drain Current | $T_A$ = 25 °C, $t_p$ = 10 μs | | $I_{DM}$ | 74 | A |
| Operating Junction and Storage Temperature | | | $T_J$, $T_{stg}$ | −55 to +175 | °C |
| Source Current (Body Diode) | | | $I_S$ | 19 | A |
| Single Pulse Drain-to-Source Avalanche Energy ($T_J$ = 25°C, $V_{DD}$ = 24 V, $V_{GS}$ = 10 V, $R_G$ = 25 Ω) | ($I_{L(pk)}$ = 14.5 A, L = 0.1 mH) | | $E_{AS}$ | 10.5 | mJ |
| | ($I_{L(pk)}$ = 6.3 A, L = 2 mH) | | | 40 | |
| Lead Temperature 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.

### ORDERING INFORMATION

See detailed ordering, marking and shipping information on page 6 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 6.

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## THERMAL RESISTANCE MAXIMUM RATINGS (Note 1)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction-to-Mounting Board (top) – Steady State (Note 2, 3) | $R_{\Psi J-mb}$ | 6.5 | °C/W |
| Junction-to-Ambient – Steady State (Note 3) | $R_{\theta JA}$ | 47 | |

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. Psi (Ψ) is used as required per JESD51-12 for packages in which substantially less than 100% of the heat flows to single case surface.
3. Surface-mounted on FR4 board using a 650 $mm^2$, 2 oz. Cu pad.
4. Maximum current for pulses as long as 1 second is higher but is dependent on pulse duration and duty cycle.

## 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 | | 60 | | | V |
| Drain-to-Source Breakdown Voltage Temperature Coefficient | $V_{(BR)DSS}/T_J$ | | | | 53 | | mV/°C |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 60 V | $T_J$ = 25 °C | | | 1.0 | μA |
| | | | $T_J$ = 125 °C | | | 10 | |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20 V | | | | ±100 | nA |
| **ON CHARACTERISTICS** (Note 5) | | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 250 μA | | 1.0 | | 3.0 | V |
| Negative Threshold Temperature Coefficient | $V_{GS(TH)}/T_J$ | | | | 3.5 | | mV/°C |
| Drain-to-Source On Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10 V | $I_D$ = 7.5 A | | 31 | 39 | mΩ |
| | | $V_{GS}$ = 4.5 V | $I_D$ = 7.5 A | | 42 | 60 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 15 V, $I_D$ = 5.0 A | | | 7.0 | | S |
| **CHARGES AND CAPACITANCES** | | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0 V, f = 1.0 MHz, $V_{DS}$ = 25 V | | | 540 | | pF |
| Output Capacitance | $C_{oss}$ | | | | 55 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 36 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ = 4.5 V, $V_{DS}$ = 48 V, $I_D$ = 5.0 A | | | 5.9 | | nC |
| Threshold Gate Charge | $Q_{G(TH)}$ | | | | 0.62 | | |
| Gate-to-Source Charge | $Q_{GS}$ | | | | 1.64 | | |
| Gate-to-Drain Charge | $Q_{GD}$ | | | | 2.80 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 48V, $I_D$ = 5.0A | | | 11 | 20 | nC |
| **SWITCHING CHARACTERISTICS** (Note 6) | | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$ = 4.5 V, $V_{DS}$ = 48 V, $I_D$ = 5.0 A, $R_G$ = 2.5 Ω | | | 8.1 | | ns |
| Rise Time | $t_r$ | | | | 15.8 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 11.8 | | |
| Fall Time | $t_f$ | | | | 3.9 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 48 V, $I_D$ = 5.0 A, $R_G$ = 2.5 Ω | | | 4.9 | | ns |
| Rise Time | $t_r$ | | | | 6.4 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 14.5 | | |
| Fall Time | $t_f$ | | | | 2.4 | | |

5. Pulse Test: pulse width = 300 μs, duty cycle ≤ 2%.
6. Switching characteristics are independent of operating junction temperatures.



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**ELECTRICAL CHARACTERISTICS** ($T_J$ = 25 °C unless otherwise specified) (continued)

| Parameter | Symbol | Test Condition | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **DRAIN-SOURCE DIODE CHARACTERISTICS** | | | | | | | |
| Forward Diode Voltage | $V_{SD}$ | $V_{GS}$ = 0 V, $I_S$ = 5.0 A | $T_J$ = 25°C | | 0.8 | 1.2 | V |
| | | | $T_J$ = 125°C | | 0.7 | | |
| Reverse Recovery Time | $t_{RR}$ | $V_{GS}$ = 0 V, $d_{IS}/d_t$ = 100 A/μs, $I_S$ = 5.0 A | | | 14.5 | | ns |
| Charge Time | $t_a$ | | | | 11.5 | | |
| Discharge Time | $t_b$ | | | | 3.1 | | |
| Reverse Recovery Charge | $Q_{RR}$ | | | | 11 | | nC |
| **PACKAGE PARASITIC VALUES** | | | | | | | |
| Source Inductance | $L_S$ | $T_A$ = 25 °C | | | 0.93 | | nH |
| Drain Inductance | $L_D$ | | | | 0.005 | | |
| Gate Inductance | $L_G$ | | | | 1.84 | | |
| Gate Resistance | $R_G$ | | | | 1.5 | | Ω |

5. Pulse Test: pulse width = 300 μs, duty cycle ≤ 2%.
6. Switching characteristics are independent of operating junction temperatures.

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.



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## TYPICAL CHARACTERISTICS

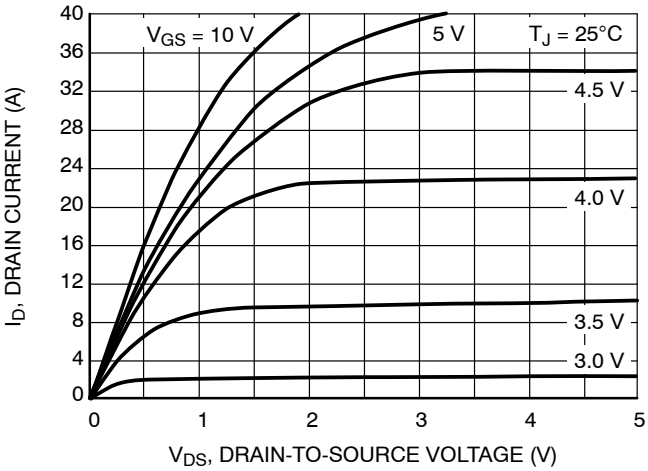



**Figure 1. On-Region Characteristics**

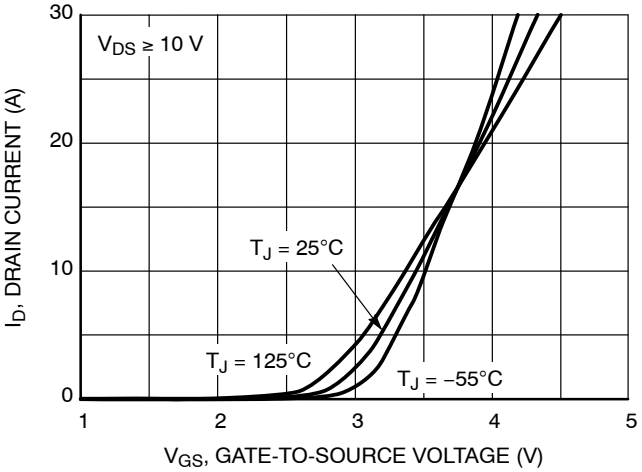



**Figure 2. Transfer Characteristics**

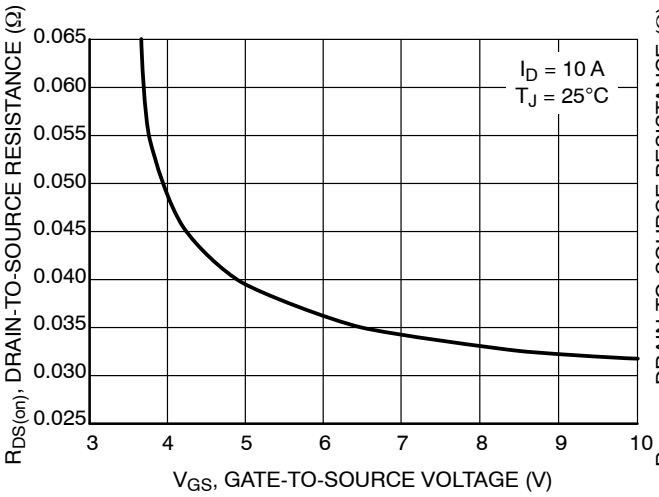



**Figure 3. On-Resistance vs. Gate-to-Source Voltage**

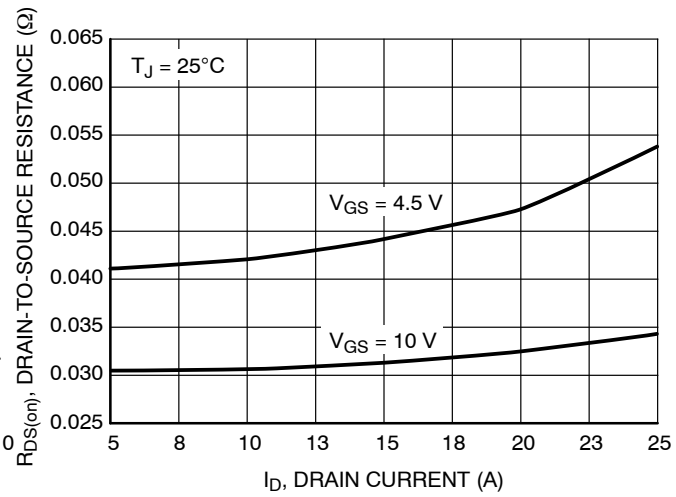



**Figure 4. On-Resistance vs. Drain Current and Gate Voltage**

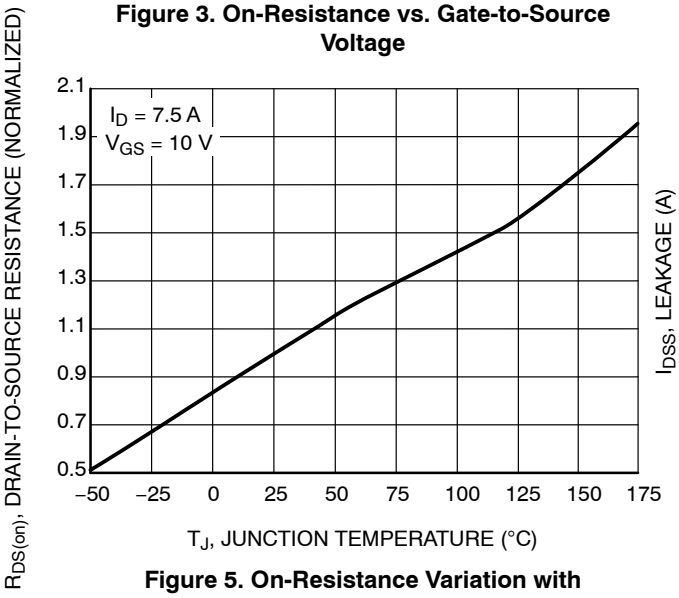



**Figure 5. On-Resistance Variation with Temperature**

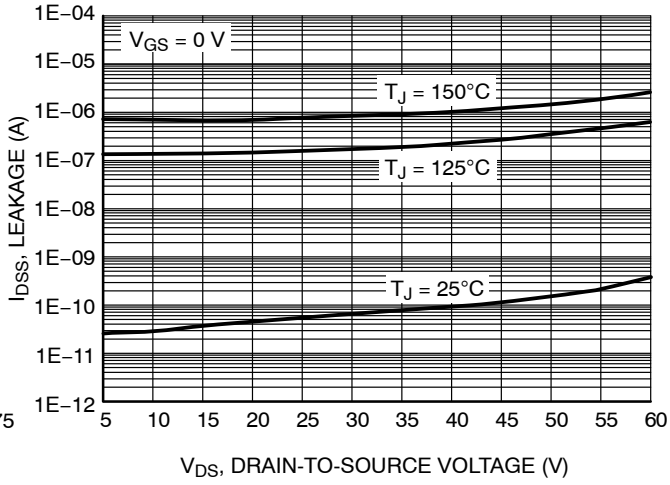



**Figure 6. Drain-to-Source Leakage Current vs. Voltage**



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## TYPICAL CHARACTERISTICS

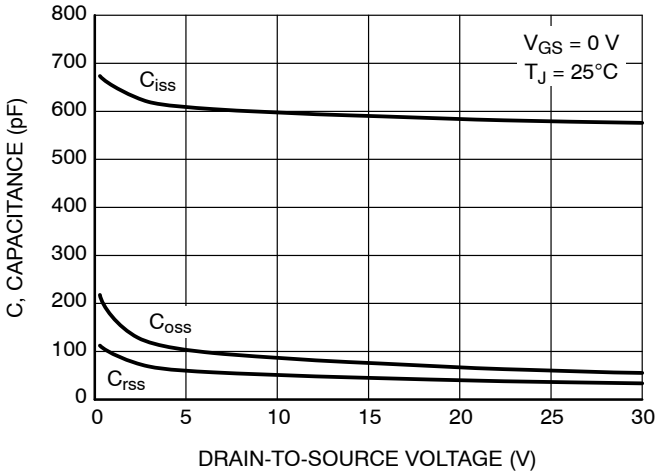



**Figure 7. Capacitance Variation**

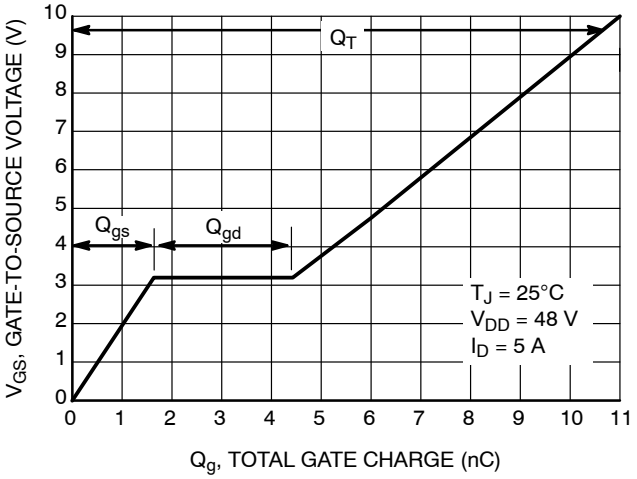



**Figure 8. Gate-to-Source vs. Gate Charge**

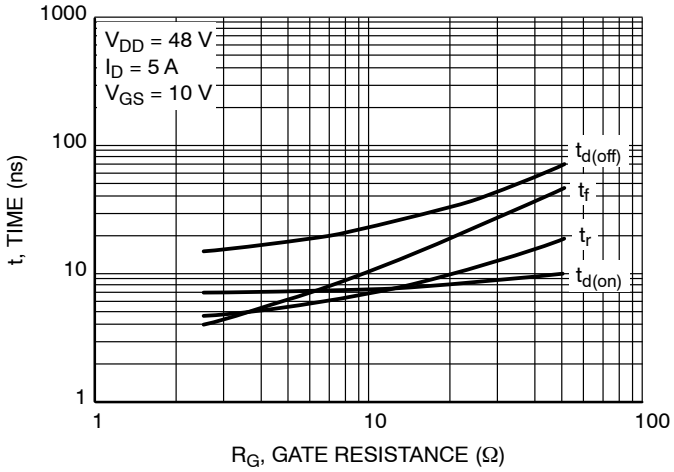



**Figure 9. Resistive Switching Time Variation vs. Gate Resistance**

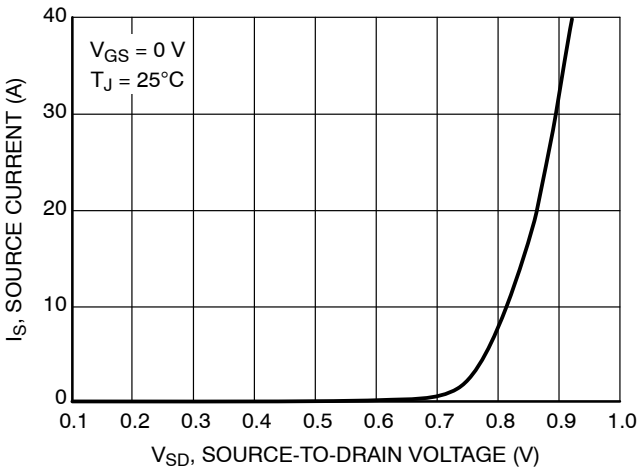



**Figure 10. Diode Forward Voltage**

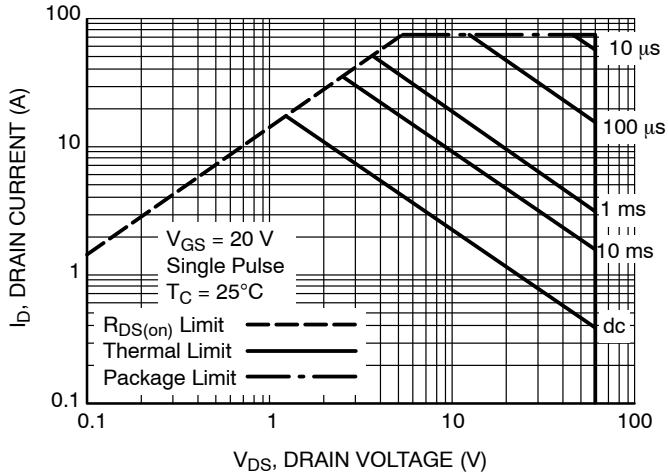



**Figure 11. Maximum Rated Forward Biased Safe Operating Area**



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## TYPICAL CHARACTERISTICS

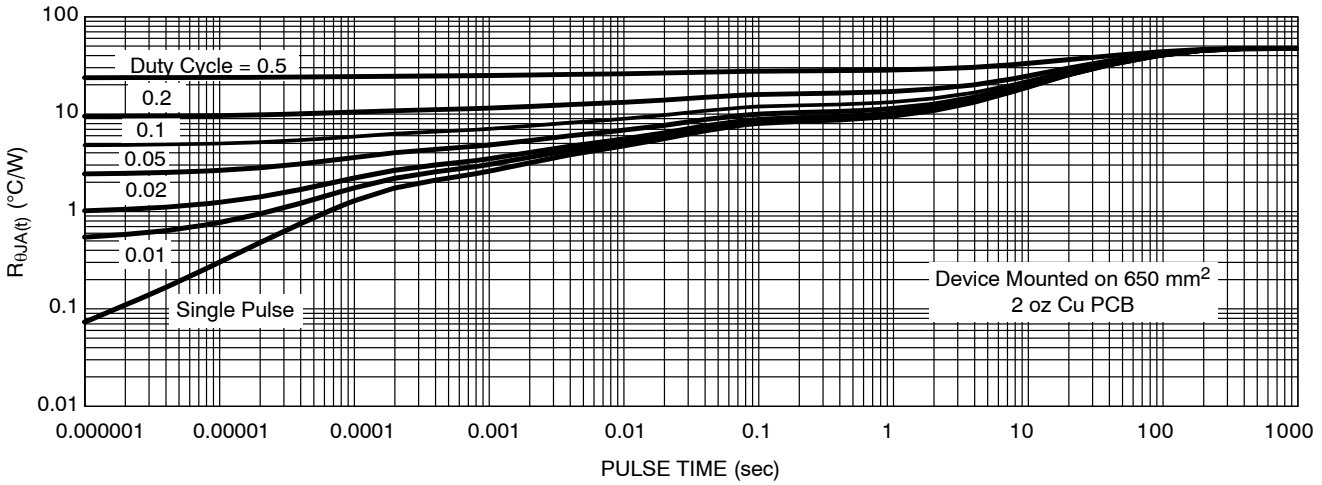



**Figure 12. Thermal Response**

### DEVICE ORDERING INFORMATION

| Device | Marking | Package | Shipping† |
|---|---|---|---|
| NVMFD5877NLWFT1G-UM | 5877LW | DFN8<br>(Pb-Free) | 1500 / Tape & Reel |

**DISCONTINUED** (Note 7)

| | | | |
|---|---|---|---|
| NVMFD5877NLT1G | 5877NL | DFN8<br>(Pb-Free) | 1500 / Tape & Reel |
| NVMFD5877NLWFT1G | 5877LW | DFN8<br>(Pb-Free) | 1500 / Tape & Reel |
| NVMFD5877NLT3G | 5877NL | DFN8<br>(Pb-Free) | 5000 / Tape & Reel |
| NVMFD5877NLWFT3G | 5877LW | DFN8<br>(Pb-Free) | 5000 / 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.

7. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.

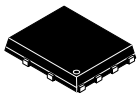


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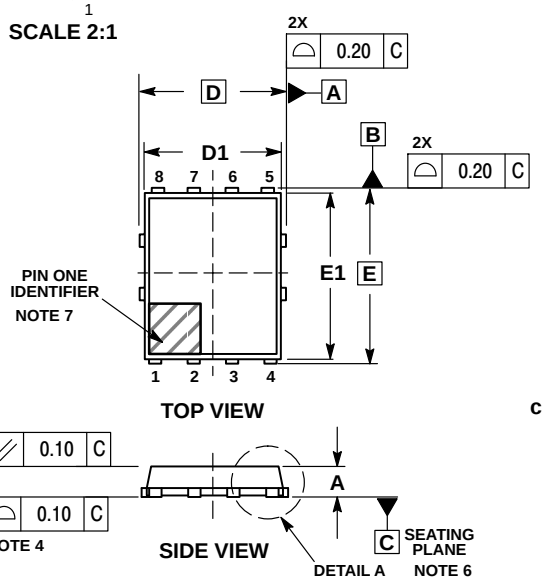
## DFN8 5x6, 1.27P Dual Flag (SO8FL−Dual)

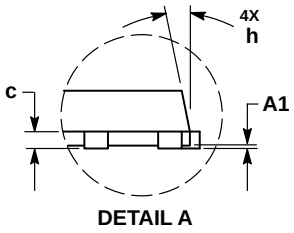
CASE 506BT
ISSUE F

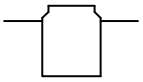
DATE 23 NOV 2021



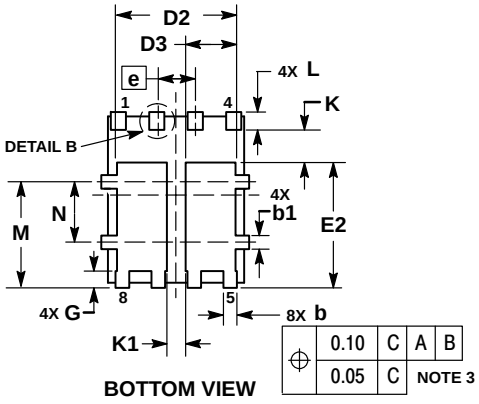
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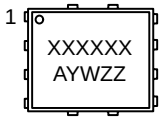
DETAIL B
ALTERNATE CONSTRUCTION




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM THE TERMINAL TIP.
4. PROFILE TOLERANCE APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
6. SEATING PLANE IS DEFINED BY THE TERMINALS. A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
7. A VISUAL INDICATOR FOR PIN 1 MUST BE LOCATED IN THIS AREA.

| | MILLIMETERS | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | 0.90 | ––– | 1.10 |
| A1 | ––– | ––– | 0.05 |
| b | 0.33 | 0.42 | 0.51 |
| b1 | 0.33 | 0.42 | 0.51 |
| c | 0.20 | ––– | 0.33 |
| D | | 5.15 BSC | |
| D1 | 4.70 | 4.90 | 5.10 |
| D2 | 3.90 | 4.10 | 4.30 |
| D3 | 1.50 | 1.70 | 1.90 |
| E | | 6.15 BSC | |
| E1 | 5.70 | 5.90 | 6.10 |
| E2 | 3.90 | 4.15 | 4.40 |
| e | | 1.27 BSC | |
| G | 0.45 | 0.55 | 0.65 |
| h | ––– | ––– | 12 ° |
| K | 0.51 | ––– | ––– |
| K1 | 0.56 | ––– | ––– |
| L | 0.48 | 0.61 | 0.71 |
| M | 3.25 | 3.50 | 3.75 |
| N | 1.80 | 2.00 | 2.20 |

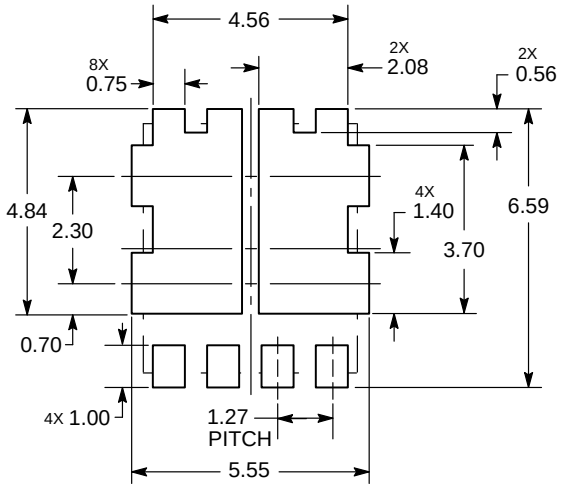
### GENERIC MARKING DIAGRAM*




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

*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.

### SOLDERING FOOTPRINT*




DIMENSION: MILLIMETERS

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

| | | | |
|---|---|---|---|
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| **DESCRIPTION:** | **DFN8 5X6, 1.27P DUAL FLAG (SO8FL−DUAL)** | | **PAGE 1 OF 1** |

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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.

**www.entegreci.com**

### 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.