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*WX037N09PA*

# Enhancement Mode N-Channel Power MOSFET

## PDFN5X6/NMOS/85V/±20V/2.8V/100A/4.4mΩ

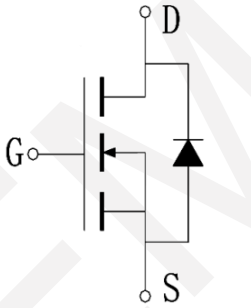
**Rev0.5**

# 85V, 4.4mΩ, 100A, N-Channel MOSFET

## 1.Features

- 85V MOSFET technology
- Low on-state resistance
- Fast switching
- Vgs±20V
- 100% RG Tested
- 100% UIS Tested

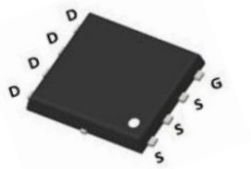
| $V_{DS}$ | $R_{DS(on)}$ Typ. | $I_D$ Max. |
|---|---|---|
| 85V | 4.4mΩ @ 10V | 100A |




Schematic Diagram

## 2.Applications

- Power Switching Application
- Load Switching



PDFN5X6

Pin Description

## 3.Package Marking and Ordering Information

| Part no. | Marking | Package | PCS/Reel | PCS/CTN. |
|---|---|---|---|---|
| WX037N09PA | 037N09 | PDFN5X6 | 5,000 | 50,000 |

## 4.Absolute Max Ratings at Ta=25℃ (Note1)

| Parameter | Symbol | Maximum | Units |
|---|---|---|---|
| Drain to Source Voltage | $V_{DSS}$ | 85 | V |
| Gate to Source Voltage | $V_{GSS}$ | ±20 | V |
| Drain Current (DC) | $I_D$ | 100 | A |
| Drain Current (Pulse), PW≤300μs | $I_{DP}$ | 400 | A |
| Total Dissipation | $P_D$ | 125 | W |
| Avalanche Energy, Single Pulsed | $E_{AS}$ | 495 | mJ |
| Junction Temperature | $T_j$ | 150 | ℃ |
| Storage Temperature | $T_{stg}$ | -55 to +150 | ℃ |

Note 1: 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.

## 5.Thermal Resistance Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction to case | $R_{\theta JC}$ | 1.0 | ℃/W |

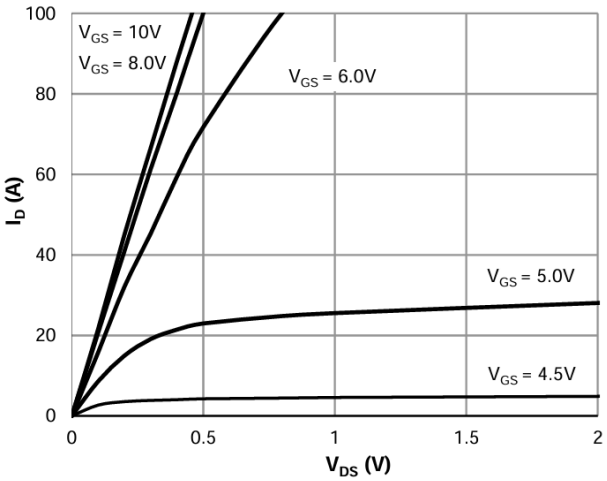
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

## 6.Electrical Characteristics at Ta=25℃ (Note 3)

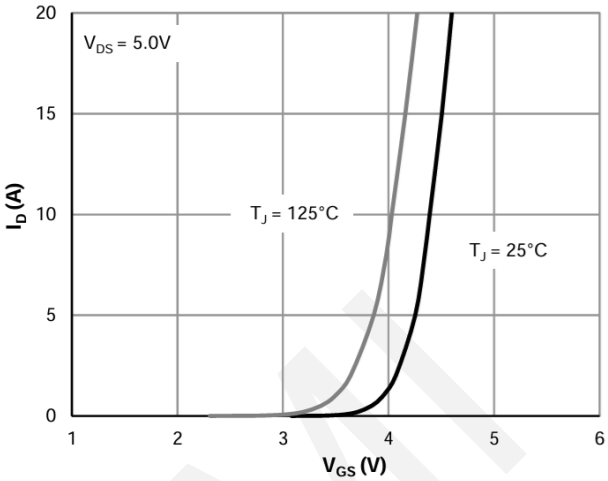
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$ = 250μA, $V_{GS}$ = 0V | 85 | - | - | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 80V, $V_{GS}$ = 0V | - | - | 1 | μA |
| Gate to Source Leakage Current | $I_{GSS1}$ | $V_{GS}$ = ±20V, $V_{SS}$ = 0V | - | - | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_{DS}$=250μA | 2.0 | 2.8 | 4.0 | V |
| Static Drain to Source On-State Resistance | $R_{DS(on)}$ | $I_D$ = 20A, $V_{GS}$ = 10V | - | 4.4 | 5.5 | mΩ |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=40V, Frequency=1.0MHz | - | 3660 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 658 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 25 | - | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | $V_{DD}$= 40V, $V_{GS}$ = 10V, $R_{GEN}$ = 3Ω， $R_L$= 2.0Ω | - | 17.6 | - | ns |
| Rise Time | $t_r$ | | - | 27 | - | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | | - | 31 | - | ns |
| Fall Time | $t_f$ | | - | 10.8 | - | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 40V, $V_{GS}$ =0 to 10V, $I_D$ = 20A | - | 56 | - | nC |
| | $Q_{gs}$ | | - | 18.3 | - | nC |
| | $Q_{gd}$ | | - | 15 | - | nC |
| Diode Forward Voltage | $V_{FSD}$ | $I_S$ = 20A, $V_{GS}$ = 0 | 0.5 | - | 1.2 | V |

Note 3：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.

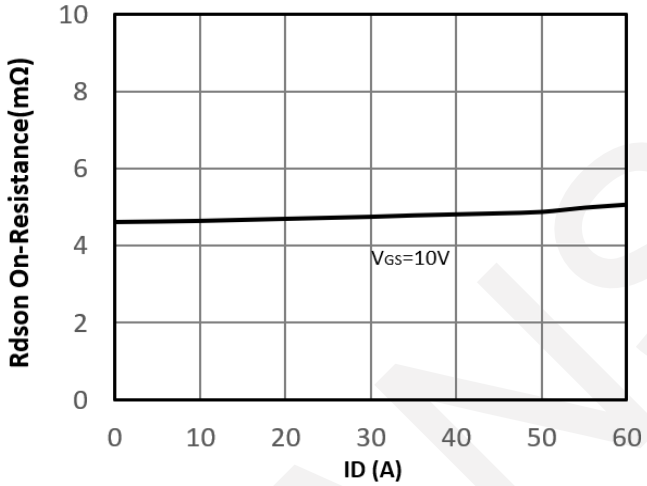
## 7.Typical electrical and thermal characteristics



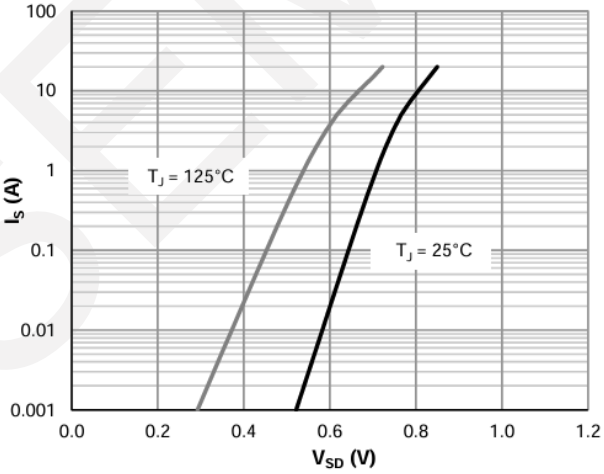

**Output Characteristics**



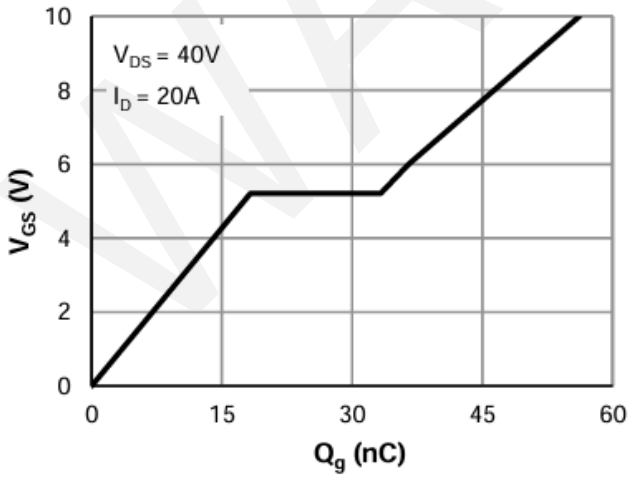

**Typical Transfer Characteristics**



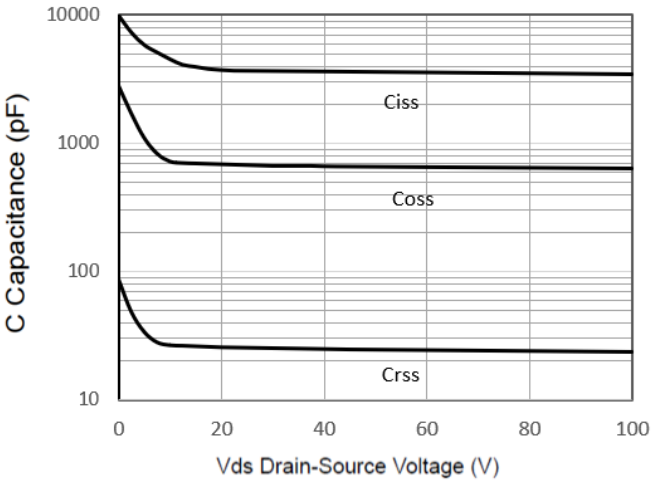

**On-resistance vs. Drain Current**



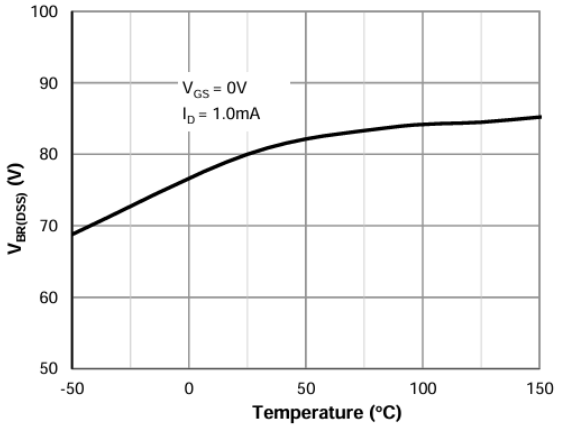

**Body Diode Characteristics**



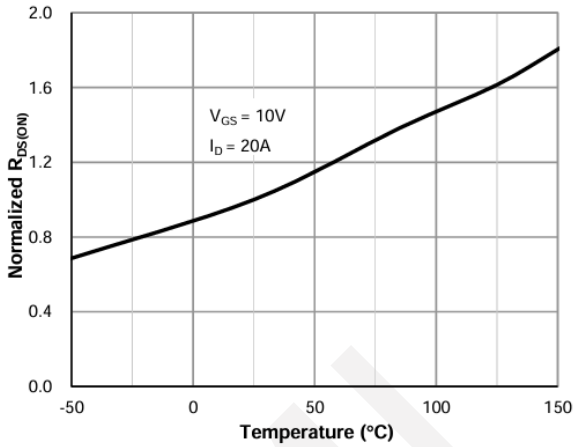

**Gate Charge Characteristics**



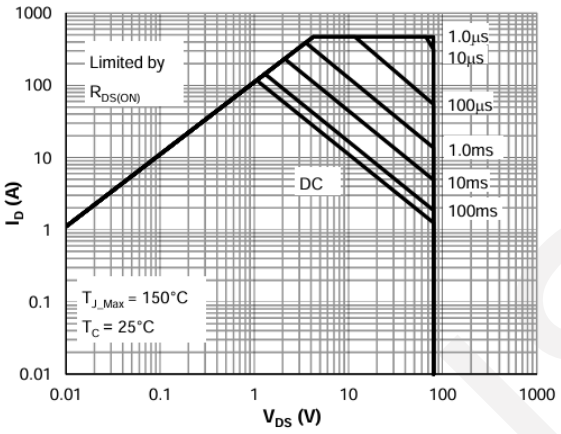

**Capacitance Characteristics**



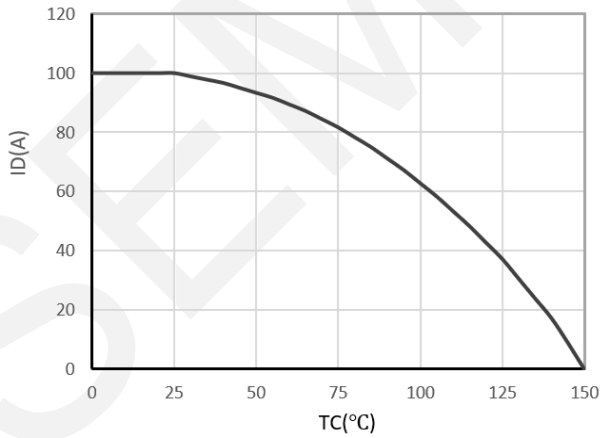

**Normalized Breakdown Voltage vs. Junction Temperature**



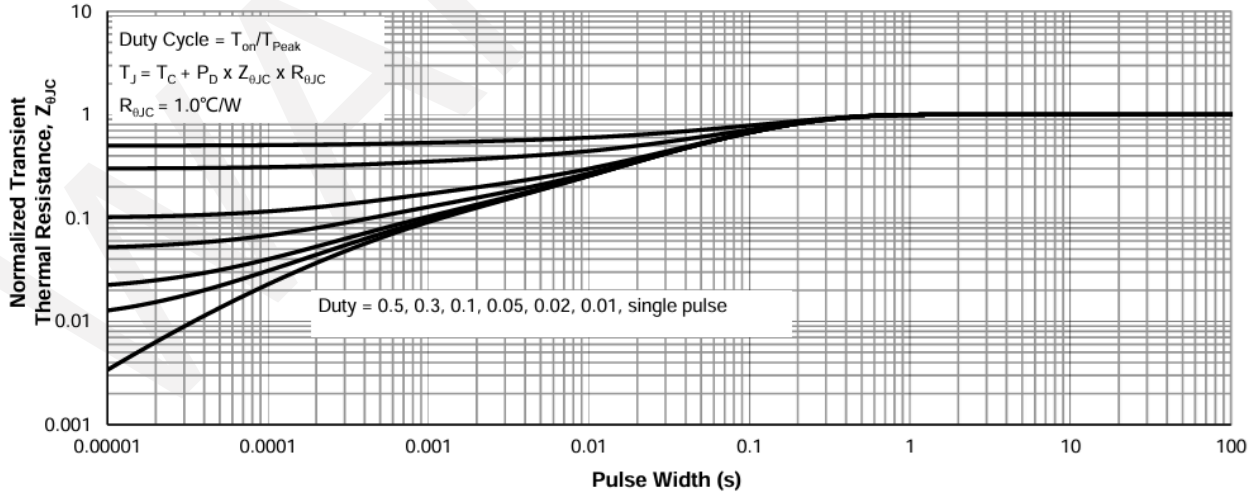

**Normalized on Resistance vs. Junction Temperature**




**Maximum Safe Operating Area**

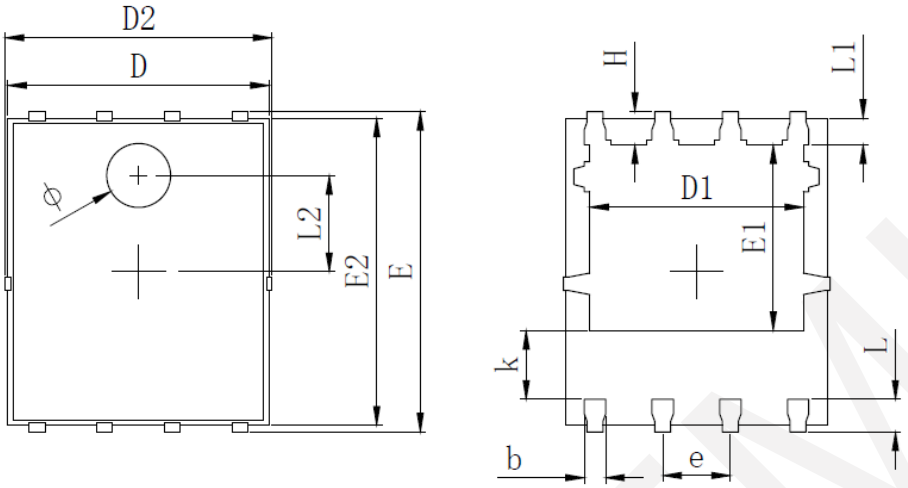



**Maximum Continuous Drain Current vs. Case Temperature**




**Normalized Maximum Transient Thermal Impedance**

## 8.Package Dimensions




| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | Typ. | MAX |
| A | 0.900 | 1.000 | 1.100 |
| A1 | 0.254 REF. | | |
| A2 | 0~0.05 | | |
| D | 4.824 | 4.900 | 4.976 |
| D1 | 3.910 | 4.010 | 4.110 |
| D2 | 4.924 | 5.000 | 5.076 |
| E | 5.924 | 6.000 | 6.076 |
| E1 | 3.375 | 3.475 | 3.575 |
| E2 | 5.674 | 5.750 | 5.826 |
| b | 0.350 | 0.400 | 0.450 |
| e | 1.270 TYP. | | |
| L | 0.534 | 0.610 | 0.686 |
| L1 | 0.424 | 0.500 | 0.576 |
| L2 | 1.800 REF. | | |
| k | 1.190 | 1.290 | 1.390 |
| H | 0.549 | 0.625 | 0.701 |
| θ | 8° | 10° | 12° |
| Φ | 1.100 | 1.200 | 1.300 |
| d | | | 0.100 |

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