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*WX600N06LL*

# N-channel Enhancement Mode Power MOSFET

**TOLL/NMOS/60V/±20V/2.9V/750A/0.55mΩ**

**Rev0.5**

# 60V, 0.55mΩ, 750A, N-channel MOSFET

## 1.Features

- Excellent RDS(ON) and Low Gate Charge
- 100% UIS Tested
- 100% ΔVds Tested
- 100% RG Tested
- Halogen-free; RoHS-compliant

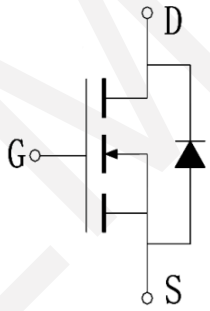
| $V_{DS}$ | $R_{DS(on)}$ Typ. | $I_D$ Max. |
|---|---|---|
| 60V | 0.55mΩ @10V | 750A |

## 2.Applications

- Load Switch
- PWM Application
- Power Management

TOLL

Pin Description




Schematic Diagram

## 3.Package Marking and Ordering Information

| Part no. | Package | Marking | PCS/Reel | PCS/CTN. |
|---|---|---|---|---|
| WX600N06LL | TOLL | 600N06 | 2,000 | 16,000 |

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

| Parameter | | Symbol | Maximum | Units |
|---|---|---|---|---|
| Drain to Source Voltage | | $V_{DSS}$ | 60 | V |
| Gate to Source Voltage | | $V_{GSS}$ | ±20 | V |
| Drain Current (DC) | T C = 25°C | $I_D$ | 750 | A |
| | T C = 100°C | $I_D$ | 500 | A |
| Drain Current (Pulse), PW≤300μs | | $I_{DM}$ | 3000 | A |
| Avalanche Energy, Single Pulsed | | $E_{AS}$ | 3721 | mJ |
| Total Dissipation | T C = 25°C | $P_D$ | 603 | W |
| | T C = 100°C | $P_D$ | 241 | W |
| 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 (Note 2)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction to Ambient | $R_{\theta JA}$ | 34 | ℃/W |
| Junction to case | $R_{\theta JC}$ | 0.21 | ℃/W |

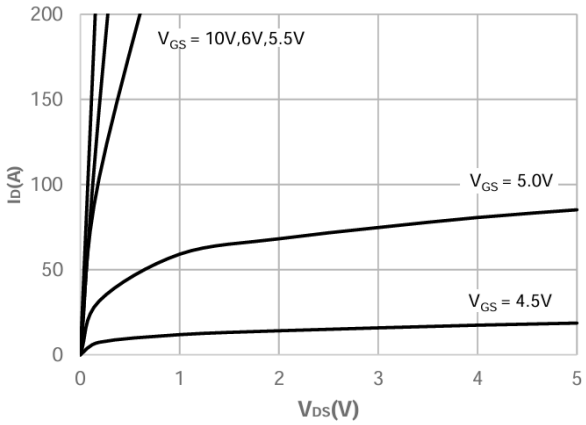
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

## 6.Electrical Characteristics at Ta=25℃ (Note 2)

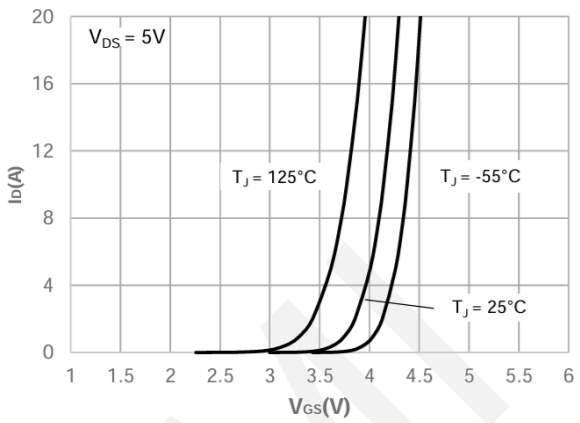
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$ = 250μA, $V_{GS}$ = 0V | 60 | - | - | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =60V, $V_{GS}$ = 0V | - | - | 1 | μA |
| Gate to Source Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | - | - | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_{DS}$=250μA | 2.0 | 2.9 | 3.5 | V |
| Static Drain to Source On-State Resistance | $R_{DS(on)}$ | $I_D$ = 20A, $V_{GS}$ = 10V | - | 0.55 | 0.70 | mΩ |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=30V, Frequency=1.0MHz | - | 14807 | - | nF |
| Output Capacitance | $C_{oss}$ | | - | 6556 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 328 | - | pF |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = 30V, $I_D$=20A, $V_{GS}$ = 10V, $R_{GEN}$ =3Ω | - | 28 | - | ns |
| Rise Time | $t_r$ | | - | 72 | - | ns |
| Turn-off Delay Time | $t_{d(off)}$ | | - | 168 | - | ns |
| Fall Time | $t_f$ | | - | 105 | - | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 30V, $V_{GS}$ = 0 to 10V, $I_D$ = 20A | - | 225 | - | nC |
| | $Q_{gs}$ | | - | 71 | - | nC |
| | $Q_{gd}$ | | - | 50 | - | nC |
| Diode Forward Voltage | $V_{FSD}$ | $I_S$ =20A, $V_{GS}$ = 0 | 0.5 | - | 1.2 | V |

Note 2：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.

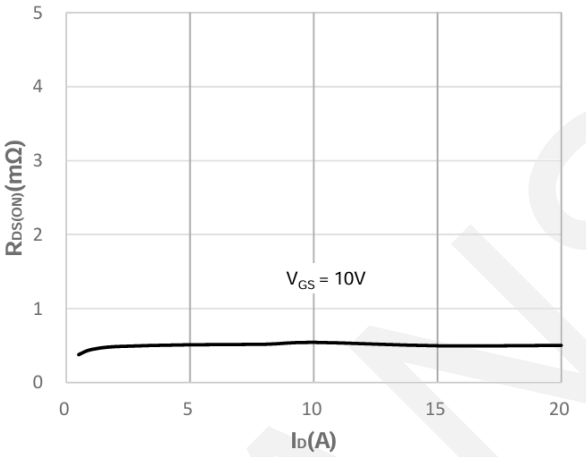
## 7.Typical electrical and thermal characteristics



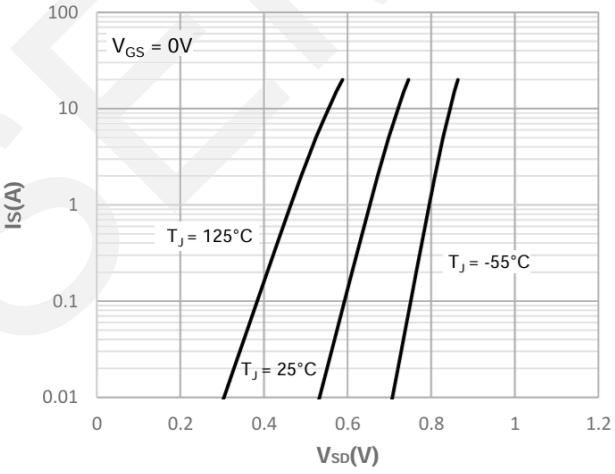

**Saturation Characteristics**



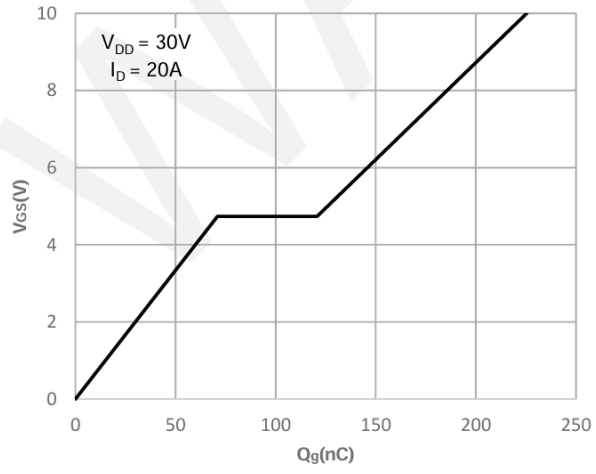

**Transfer Characteristics**



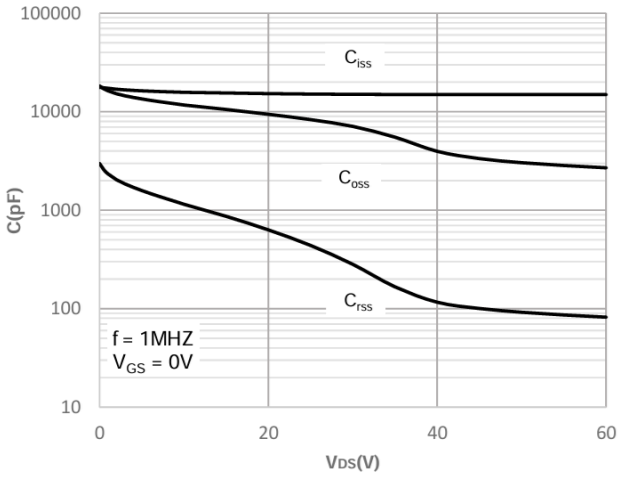

**$R_{DS(on)}$vs.Drain Current**



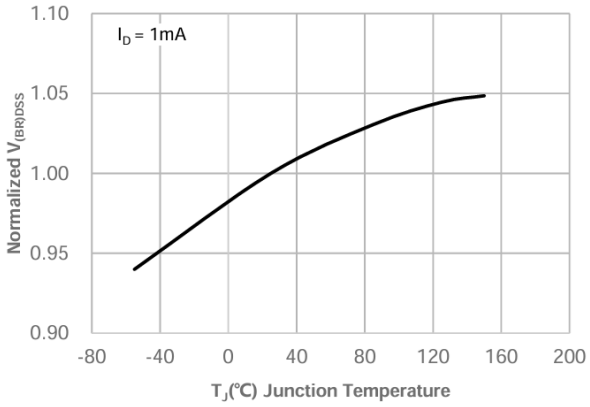

**Body-Diode Characteristics**



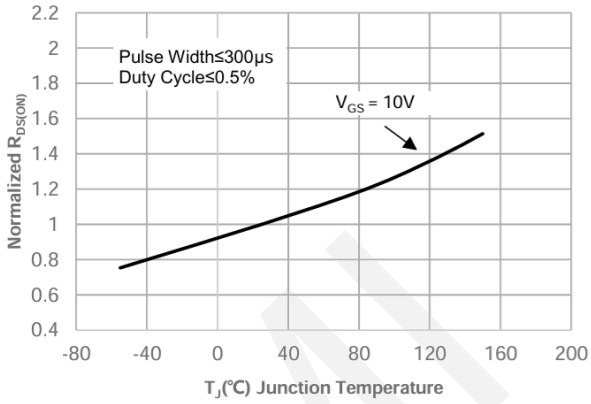

**Gate Charge Characteristics**



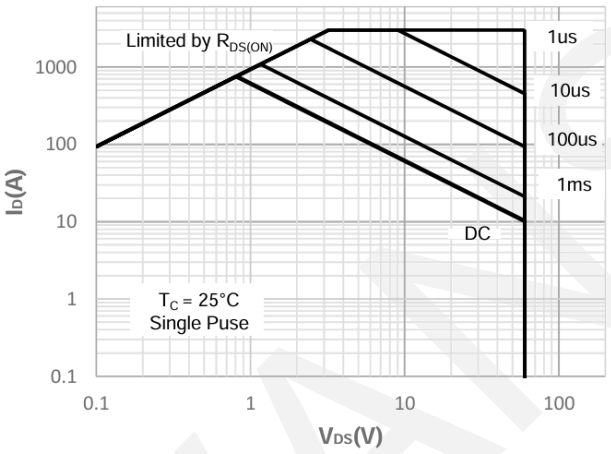

**Capacitance Characteristics**



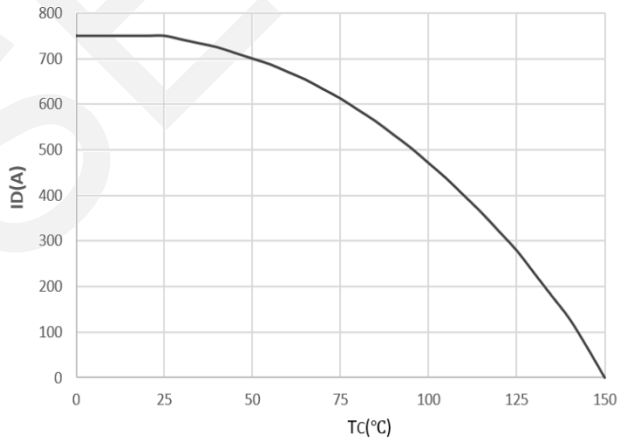

**Normalized Threshold Voltage vs. Junction Temperature**



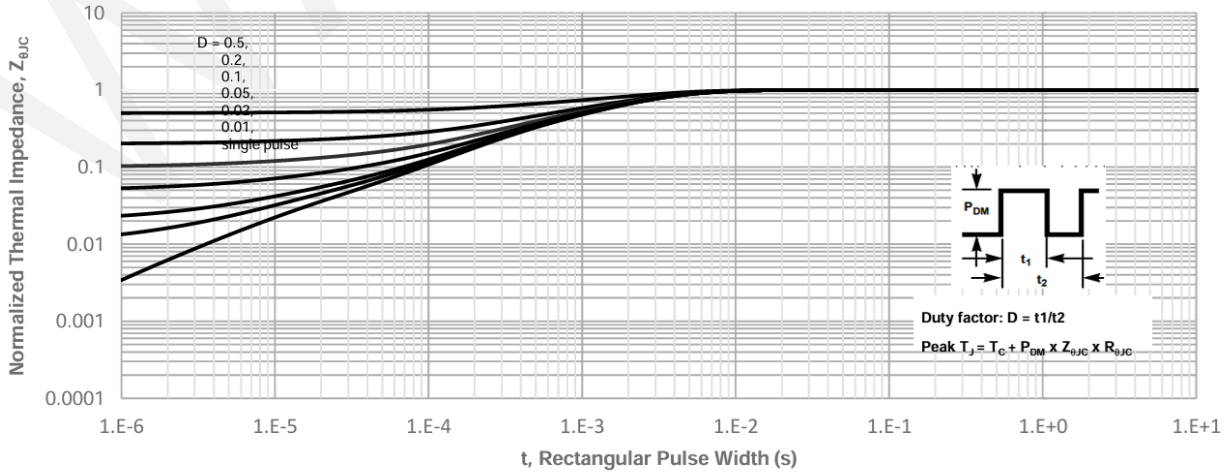

**Normalized on Resistance vs. Junction Temperature**




**Maximum Safe Operating Area**

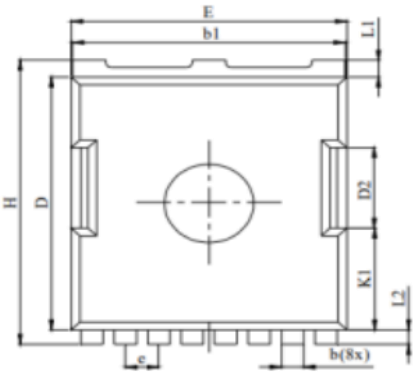



**Current De-rating**

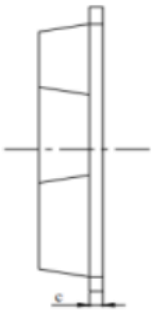



**Normalized Maximum Transient Thermal Impedance**

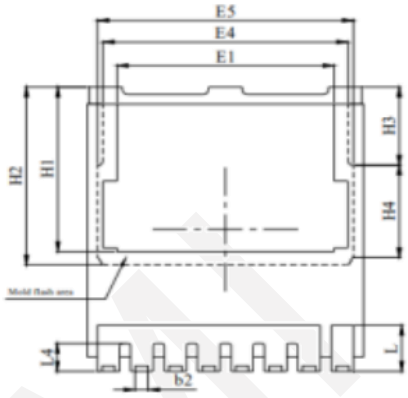
## 8.Package Dimensions



Top View

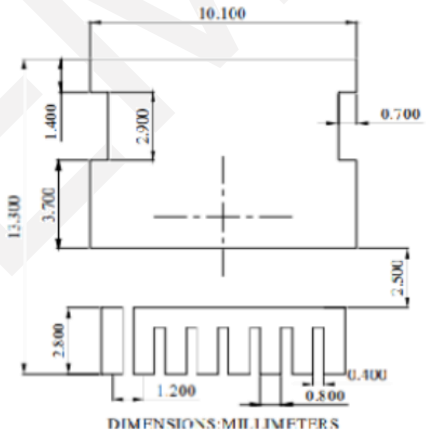


Side View



Bottom View

Front View



DIMENSIONS:MILLIMETERS

| DIM. | MILLIMETER | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 2.20 | 2.30 | 2.50 |
| b | 0.70 | 0.80 | 0.90 |
| bl | 9.70 | 9.80 | 9.90 |
| b2 | 0.42 | 0.46 | 0.50 |
| C | 0.40 | 0.50 | 0.65 |
| D | 10.28 | 10.38 | 10.58 |
| D2 | | 3.30 | |
| E | 9.70 | 9.90 | 10.10 |
| E1 | | 7.80 | |
| E4 | | 8.80 | |
| E5 | | 9.20 | |
| e | | 1.20(BSC) | |
| H | 11.48 | 11.68 | 11.88 |
| Hl | 6.55 | 6.75 | 6.85 |
| H2 | | 7.30 | |
| H3 | | 3.20 | |
| H4 | | 3.80 | |
| K1 | | 4.18 | |
| L | 1.70 | 1.90 | 2.10 |
| L1 | | 0.70 | |
| L2 | | 0.60 | |
| L4 | 1.00 | 1.15 | 1.30 |

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