80V N-ChannelEnhancement Mode MOSFET

RoHS COMPLIANT

## Description

The XPX80N023LL uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

$V_{DS}$ =80V,$I_D$ =400A

$R_{DS(ON)}$=0.7mΩ (typ) @ $V_{GS}$=10V

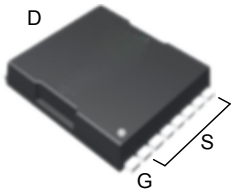
$R_{DS(ON)}$=1.1mΩ (typ) @ $V_{GS}$=4.5V

## General Features

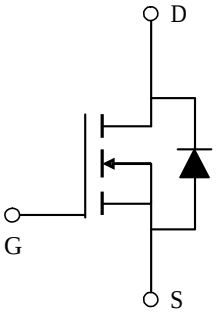
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high $E_{AS}$
- Excellent package for good heat dissipation

## Application

- PWM
- Load Switching




TOLL




## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| XPX80N400LL | XPX80N400LL | TOLL | - | - | 2000 |

## Absolute Maximum Ratings ($T_C$=25℃unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 80 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous | $I_D$ | 400 | A |
| Drain Current-Continuous($T_C$=100℃) | $I_D$ (100℃) | 368 | A |
| Pulsed Drain Current | $I_{DM}$ | 1200 | A |
| Maximum Power Dissipation | $P_D$ | 456 | W |
| Derating factor | | 0.9 | W/℃ |
| Single pulse avalanche energy (Note 5) | $E_{AS}$ | 2896 | mJ |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 175 | ℃ |
| Thermal Resistance,Junction-to-Case(Note 2) | $R_{\theta JC}$ | 0.36 | ℃/W |

## Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

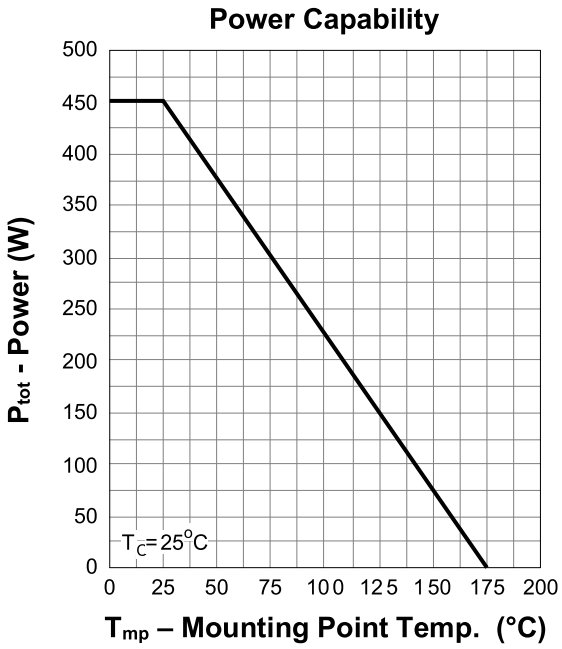
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0 V, $I_{DS}$=250 μA | 80 | - | - | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_{DS}$=250 μA | 2 | - | 4 | V |
| $I_{DSS}$ | Drain Leakage Current | $V_{DS}$=64 V, $V_{GS}$=0 V | - | - | 1 | μA |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0 V, $V_{GS}$=±20 V | - | - | ±100 | nA |
| $R_{DS(ON)}$ [a] | On-State Resistance | $V_{GS}$=10 V, $I_{DS}$=50 A | - | 0.7 | 0.85 | mΩ |
| | | $V_{GS}$=5V, $I_{DS}$=30 A | - | 1.1 | 1.25 | |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$ [a] | Diode Forward Voltage | $V_{GS}$=0V, $I_{SD}$=50 A | - | - | 1.3 | V |
| $t_{rr}$ | Reverse Recovery Time | $V_{DS}$=0 V, $I_{DS}$=50 A, $dI_{SD}/dt$=100 A/μs | - | 137 | - | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 369 | - | nC |
| **Dynamic Characteristics** [b] | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=40 V, $V_{GS}$=0 V, Frequency=1 MHz | - | 20427 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 2566 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 611 | - | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DS}$=40 V, $V_{GEN}$=10 V, $R_G$=3.9 Ω, $R_L$=0.8 Ω, $I_{DS}$=50 A | - | 47 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 122 | - | |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 226 | - | |
| $t_f$ | Turn-off Fall Time | | - | 126 | - | |
| **Gate Charge Characteristics** [b] | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=40 V, $V_{GS}$=10 V, $I_{DS}$=50 A | - | 388 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 100 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 74 | - | |

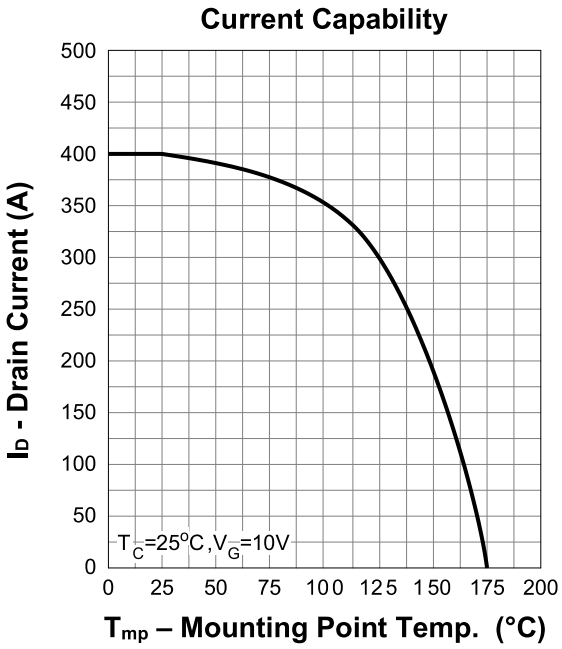
Notes:

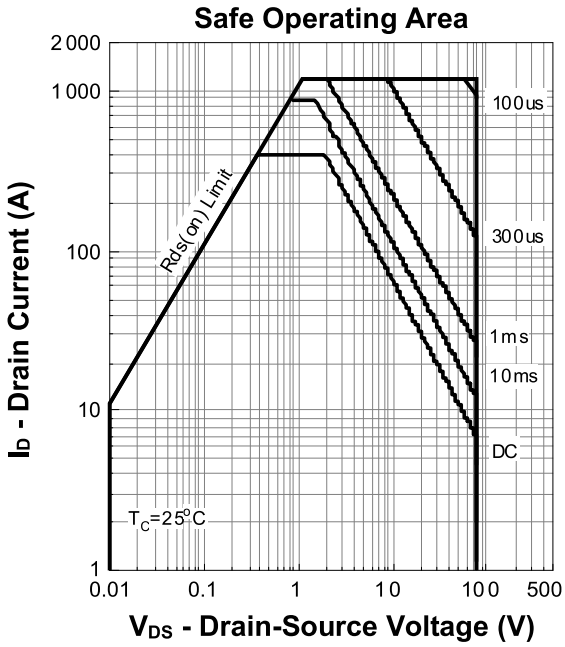
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

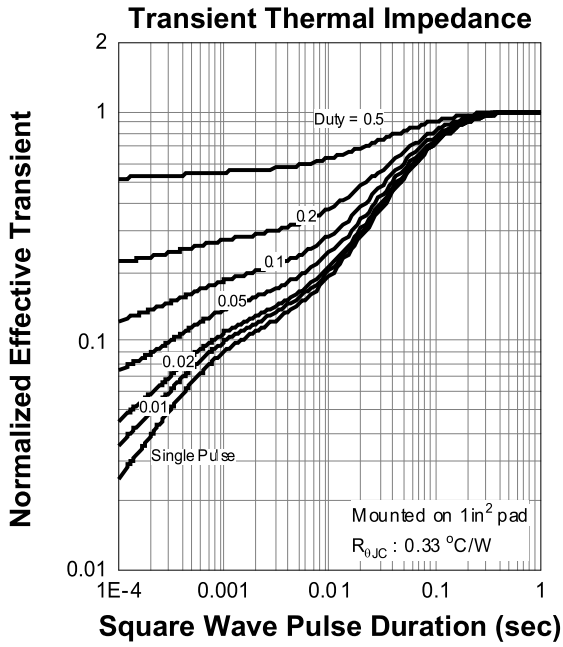
b. Guaranteed by design, not subject to production testing.

## Typical Characteristics

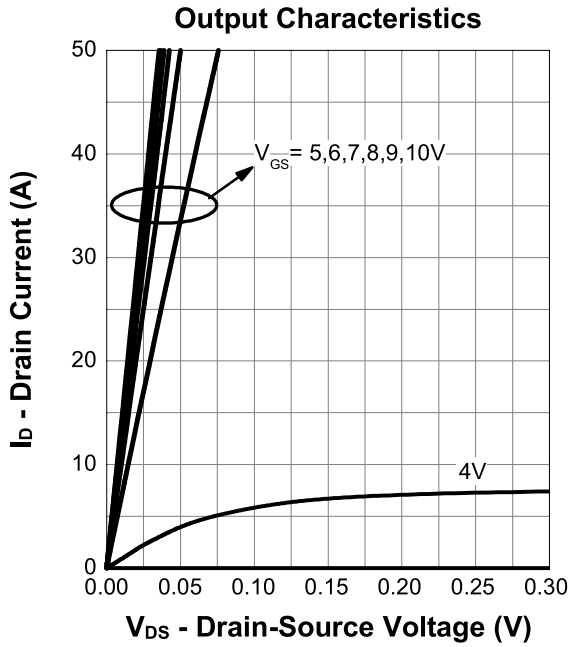


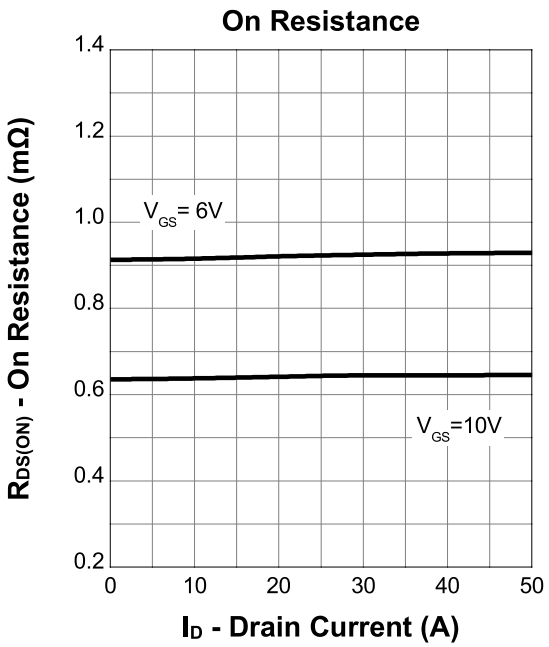



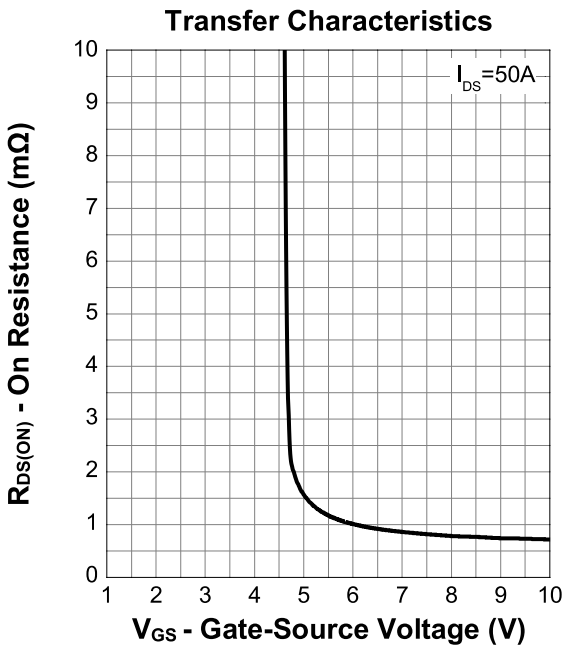



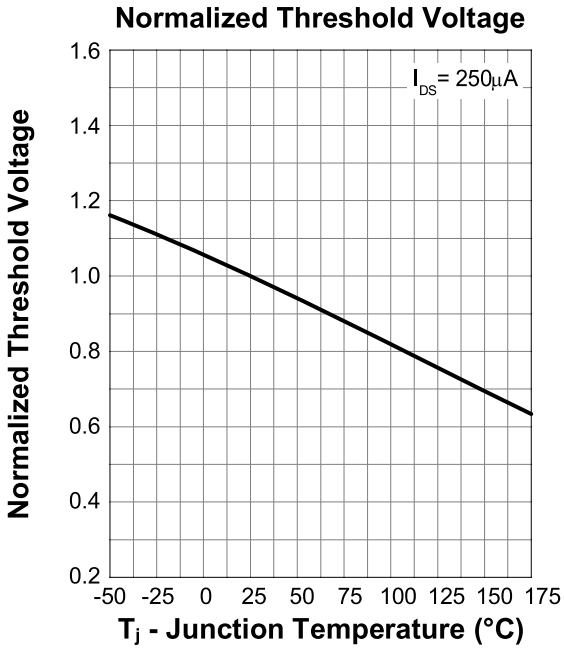



## Typical Characteristics (cont.)

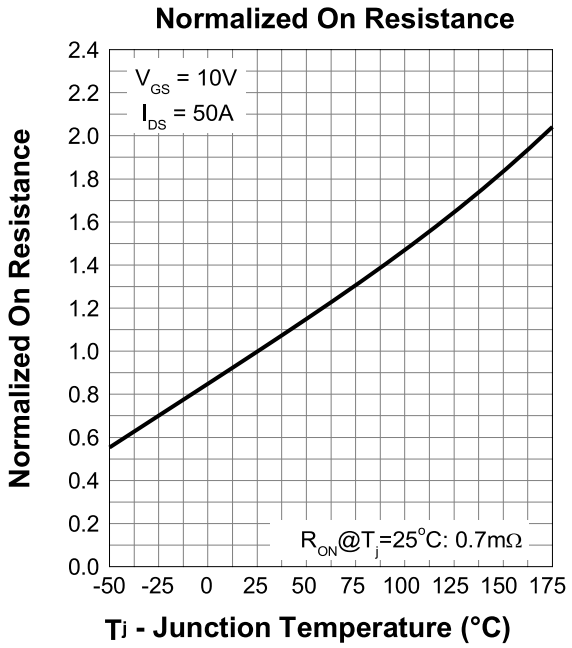


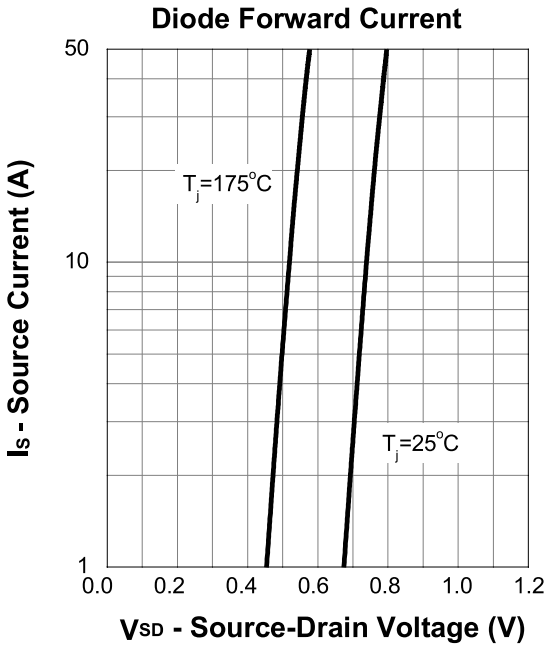



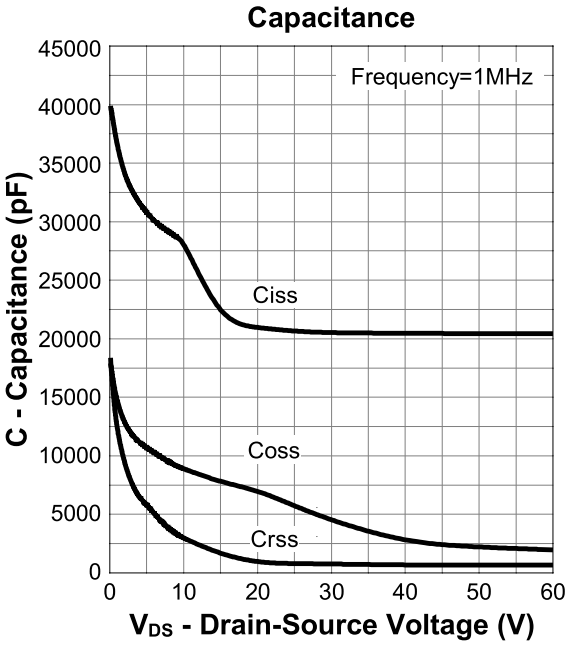



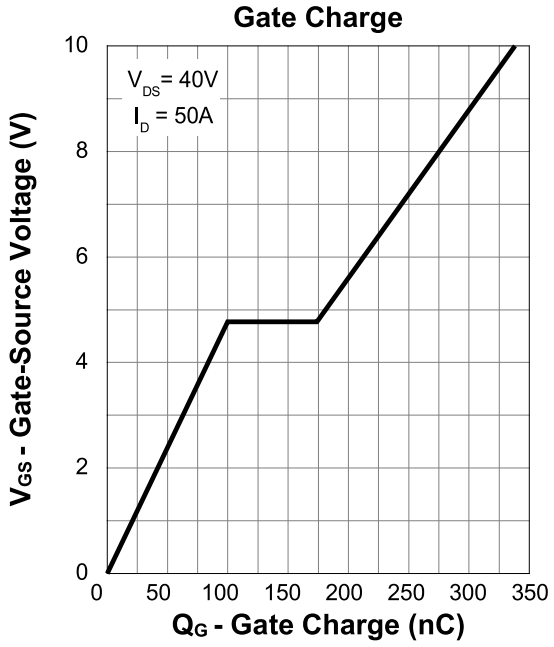



## Typical Characteristics (cont.)



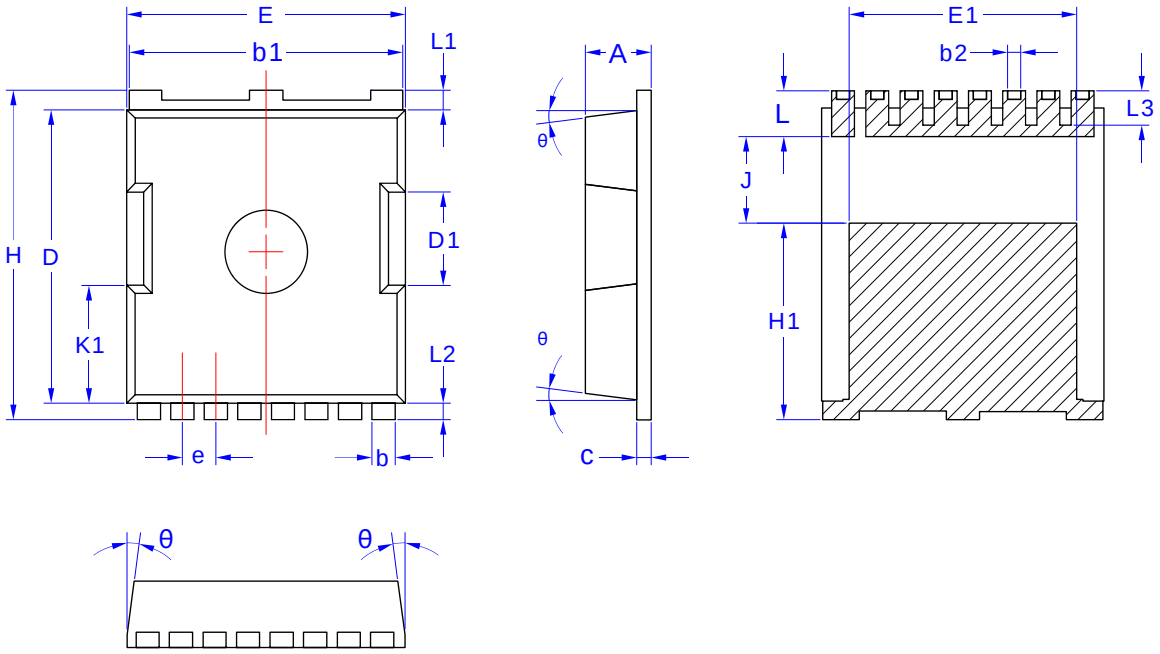



# Package Dimensions

## TOLL-8L Package




| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 2.20 | 2.40 |
| b | 0.70 | 0.90 |
| b1 | 9.70 | 9.90 |
| b2 | 0.42 | 0.50 |
| c | 0.40 | 0.60 |
| D | 10.28 | 10.58 |
| D1 | 3.10 | 3.50 |
| E | 9.70 | 10.10 |
| E1 | 7.90 | 8.30 |
| e | 1.20 BSC | |

| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| H | 11.48 | 11.88 |
| H1 | 6.75 | 7.15 |
| J | 3.00 | 3.30 |
| K1 | 3.98 | 4.38 |
| L | 1.40 | 1.80 |
| L1 | 0.60 | 0.80 |
| L2 | 0.50 | 0.70 |
| L3 | 1.00 | 1.30 |
| θ | 4° | 10° |
| | | |

Flow (wave) soldering (solder dipping)

| Product | Peak Temperature | Dipping Time |
|---|---|---|
| Pb device | 245℃±5℃ | 5sec±1sec |
| Pb-Free device | 260℃+0/-5℃ | 5sec±1sec |

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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