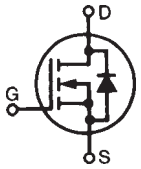
# IXYS

## High Voltage Power MOSFET

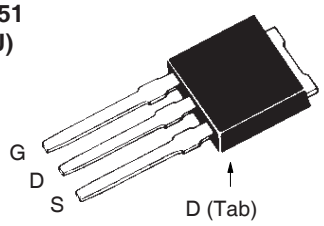
## IXTU01N100
## IXTY01N100

$V_{DSS}$ = 1000V
$I_{D25}$ = 100mA
$R_{DS(on)}$ ≤ 80Ω

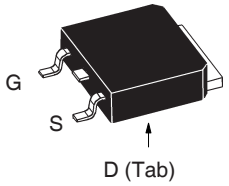
N-Channel Enhancement Mode




**TO-251 (IXTU)**




**TO-252 (IXTY)**




G = Gate D = Drain
S = Source Tab = Drain

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | 1000 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C, $R_{GS}$ = 1MΩ | 1000 | V |
| $V_{GSS}$ | Continuous | ±20 | V |
| $V_{GSM}$ | Transient | ±30 | V |
| $I_{D25}$ | $T_C$ = 25°C | 100 | mA |
| $I_{DM}$ | $T_C$ = 25°C, Pulse Width Limited by $T_{JM}$ | 400 | mA |
| $P_D$ | $T_C$ = 25°C | 25 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| $T_L$ | Maximum Lead Temperature for Soldering | 300 | °C |
| $T_{SOLD}$ | 1.6 mm (0.062in.) from Case for 10s | 260 | °C |
| $F_C$ | Mounting force | 1.13 / 10 | Nm/lb.in. |
| **Weight** | TO-251 | 0.40 | g |
| | TO-252 | 0.35 | g |

### Features

- International Standard Packages
- Fast Switching Times
- Avalanche Rated
- $R_{ds(on)}$ HDMOS™ Process
- Rugged Polysilicon Gate Cell structure

### Advantages

- High Power Density
- Space Savings

### Applications

- Level Shifting
- Triggers
- Solid State Relays
- Current Regulators

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ = 25μA | 1000 | | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 25μA | 2.0 | | 4.5 | V |
| $I_{GSS}$ | $V_{GS}$ = ± 20V, $V_{DS}$ = 0V | | | ±50 | nA |
| $I_{DSS}$ | $V_{DS}$ = 0.8 • $V_{DSS}$, $V_{GS}$ = 0V | | | 10 | μA |
| | $T_J$ = 125°C | | | 200 | μA |
| $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 50mA, Note 1 | | 60 | 80 | Ω |

© 2017 IXYS CORPORATION, All Rights Reserved

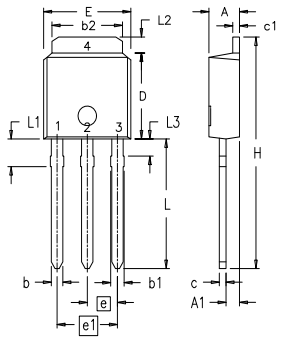
| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 10V, $I_D$ = 50mA, Note 1 | | 0.16 | | S |
| $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 54.0 | | pF |
| $C_{oss}$ | | | 6.9 | | pF |
| $C_{rss}$ | | | 2.0 | | pF |
| $t_{d(on)}$ | **Resistive Switching Times** | | 12 | | ns |
| $t_r$ | $V_{GS}$ = 10V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 50mA | | 12 | | ns |
| $t_{d(off)}$ | $R_G$ = 50Ω (External) | | 40 | | ns |
| $t_f$ | | | 28 | | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 50mA | | 6.9 | | nC |
| $Q_{gs}$ | | | 1.8 | | nC |
| $Q_{gd}$ | | | 3.0 | | nC |
| $R_{thJC}$ | | | | 5 | °C/W |

**Source-Drain Diode**

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0V | | | 100 | mA |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$ | | | 300 | mA |
| $V_{SD}$ | $I_F$ = $I_S$, $V_{GS}$ = 0V, Note 1 | | | 1.8 | V |
| $t_{rr}$ | $I_F$ = 0.75A, -di/dt = 100A/µs, $V_R$ = 25V | | | 1.5 | µs |

Note 1: Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.

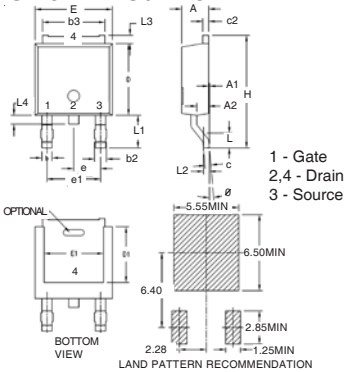
**TO-251 Outline**




1. Gate 2.Drain
3. Source 4.Drain

| Dim. | Millimeter Min. | Max. | Inches Min. | Max. |
|---|---|---|---|---|
| A | 2.19 | 2.38 | .086 | .094 |
| A1 | 0.89 | 1.14 | 0.35 | .045 |
| b | 0.64 | 0.89 | .025 | .035 |
| b1 | 0.76 | 1.14 | .030 | .045 |
| b2 | 5.21 | 5.46 | .205 | .215 |
| c | 0.46 | 0.58 | .018 | .023 |
| c1 | 0.46 | 0.58 | .018 | .023 |
| D | 5.97 | 6.22 | .235 | .245 |
| E | 6.35 | 6.73 | .250 | .265 |
| e | 2.28 | BSC | .090 | BSC |
| e1 | 4.57 | BSC | .180 | BSC |
| H | 17.02 | 17.78 | .670 | .700 |
| L | 8.89 | 9.65 | .350 | .380 |
| L1 | 1.91 | 2.28 | .075 | .090 |
| L2 | 0.89 | 1.27 | .035 | .050 |

**TO-252 AA Outline**




1 - Gate
2,4 - Drain
3 - Source

| SYM | INCHES MIN | MAX | MILLIMETERS MIN | MAX |
|---|---|---|---|---|
| A | .086 | .094 | 2.19 | 2.38 |
| A1 | 0 | .005 | 0 | 0.12 |
| A2 | .038 | .046 | 0.97 | 1.17 |
| b | .025 | .035 | 0.64 | 0.89 |
| b2 | .030 | .045 | 0.76 | 1.14 |
| b3 | .200 | .215 | 5.08 | 5.46 |
| c | .018 | .024 | 0.46 | 0.61 |
| c2 | .018 | .023 | 0.46 | 0.58 |
| D | .235 | .245 | 5.97 | 6.22 |
| D1 | .180 | .205 | 4.57 | 5.21 |
| E | .250 | .265 | 6.35 | 6.73 |
| E1 | .170 | .205 | 4.32 | 5.21 |
| e | .090 BSC | | 2.28 BSC | |
| e1 | .180 BSC | | 4.57 BSC | |
| H | .370 | .410 | 9.40 | 10.42 |
| L | .055 | .070 | 1.40 | 1.78 |
| L1 | .100 | .115 | 2.54 | 2.92 |
| L2 | .020 BSC | | 0.50 BSC | |
| L3 | .025 | .040 | 0.64 | 1.02 |
| L4 | .025 | .040 | 0.64 | 1.02 |
| θ | 0° | 10° | 0° | 10° |

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

**Fig. 1. Output Characteristics @ $T_J$ = 25°C**

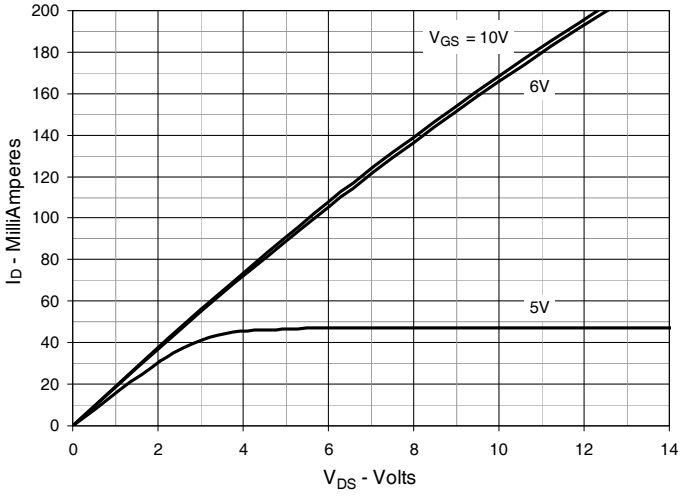



**Fig. 2. ExtendedOutput Characteristics @ $T_J$ = 25°C**

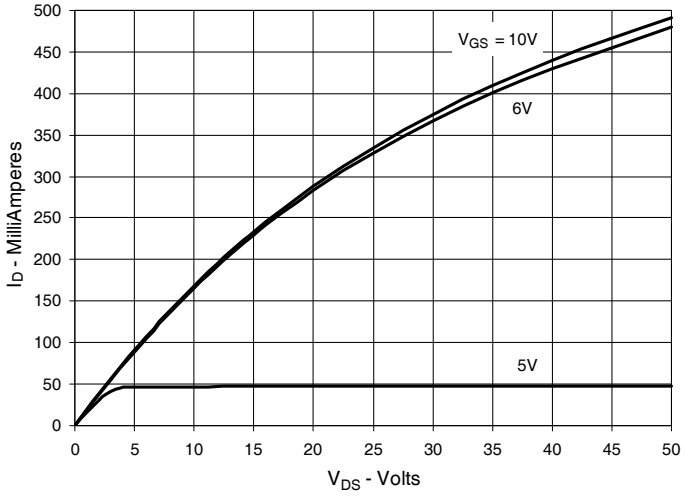



**Fig. 2. Output Characteristics @ $T_J$ = 125°C**

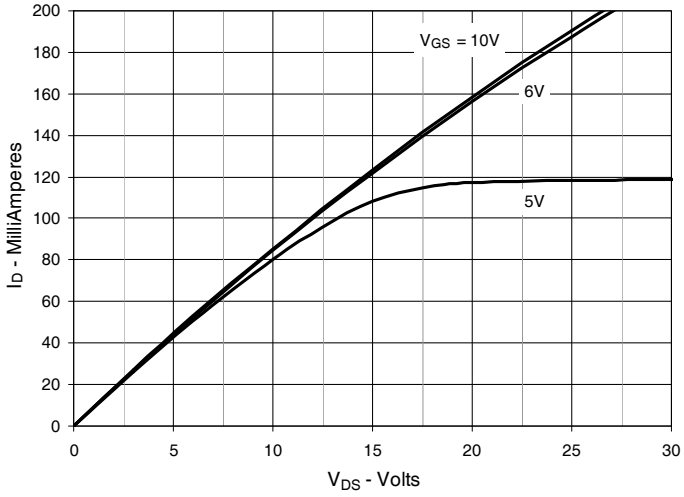



**Fig. 3. $R_{DS(on)}$ Normalized to $I_D$ = 50mA Value vs. Junction Temperature**

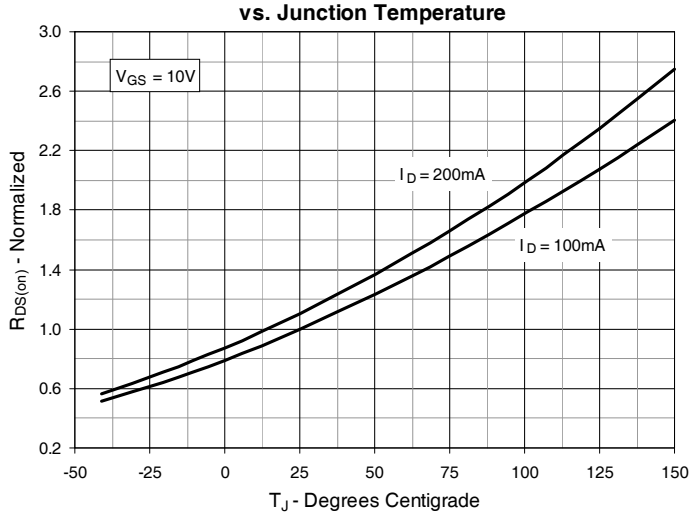



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D$ = 50mA Value vs. Drain Current**

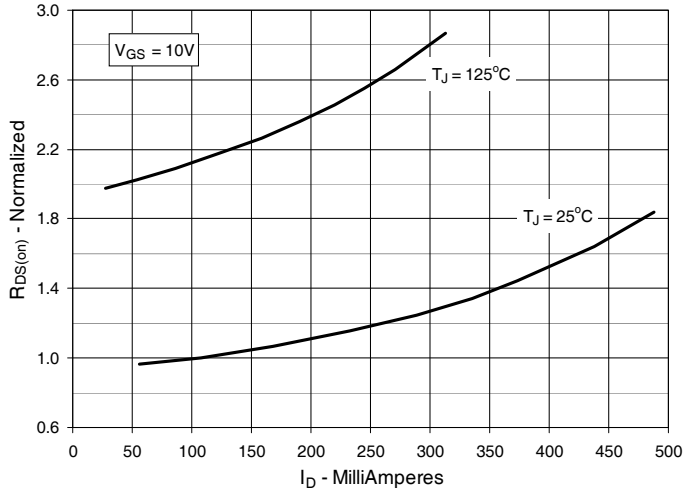
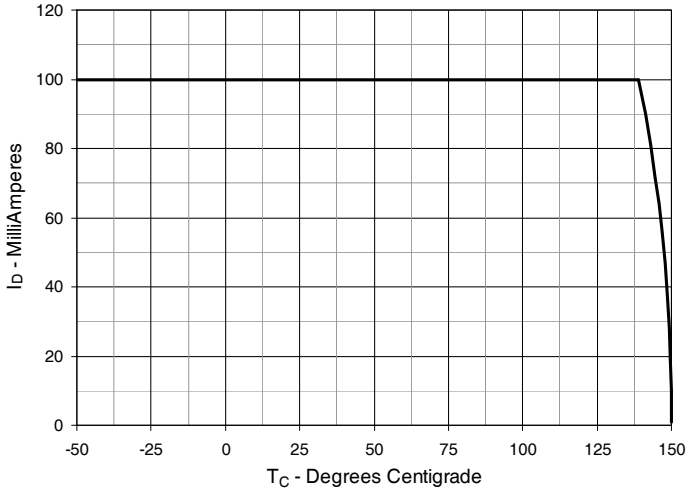



**Fig. 5. Maximum Drain Current vs. Case Temperature**




© 2017 IXYS CORPORATION, All Rights Reserved

**Fig. 7. Input Admittance**

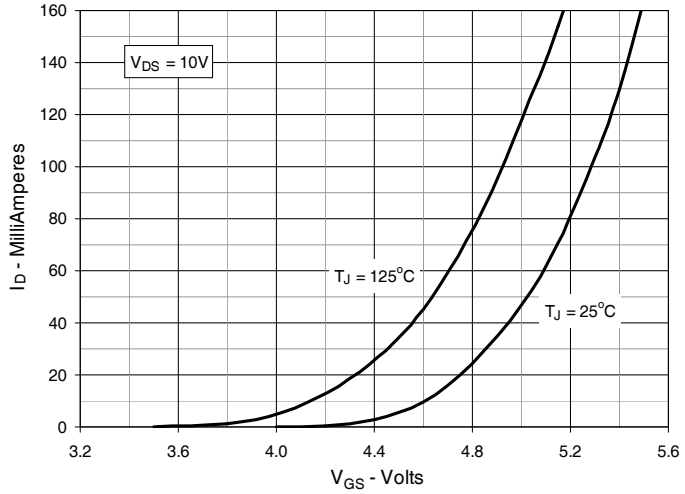



**Fig. 8. Transconductance**

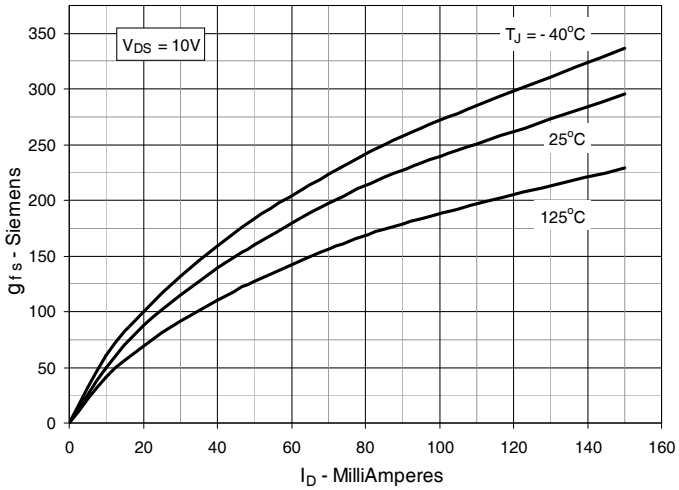



**Fig. 9. Forward Voltage Drop of Intrinsic Diode**

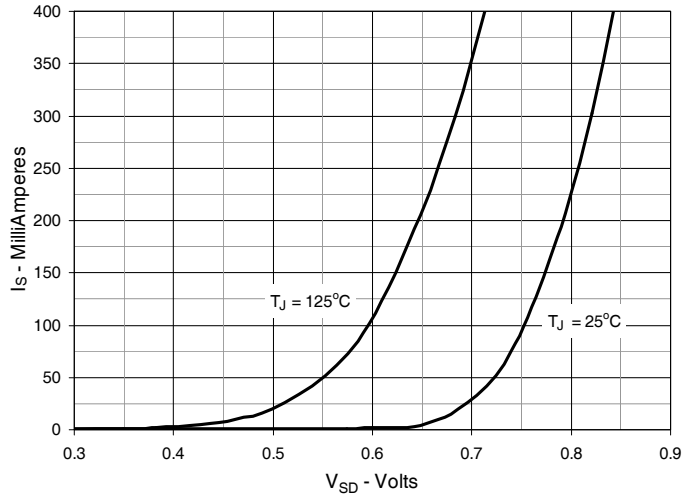



**Fig. 10. Gate Charge**

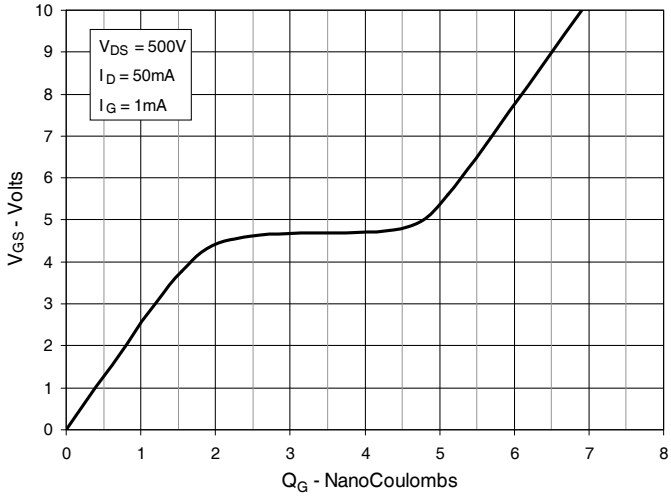



**Fig. 11. Capacitance**

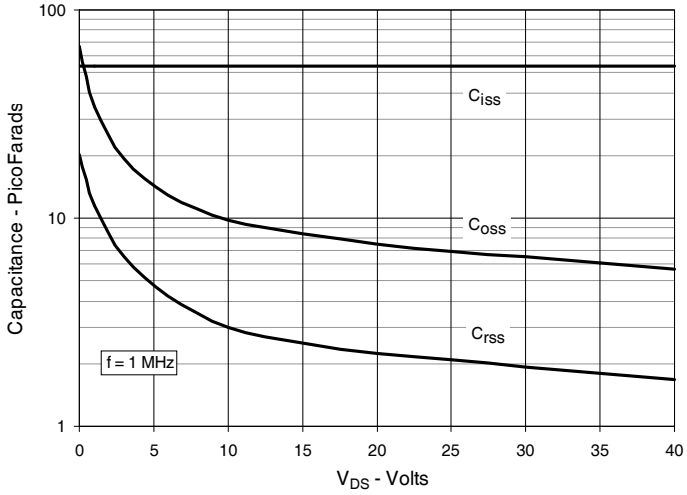
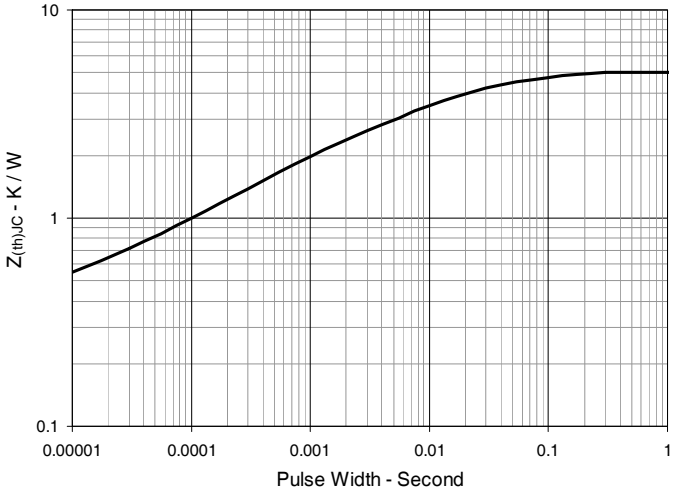



**Fig. 12. Maximum Transient Thermal Impedance**




IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.




Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.