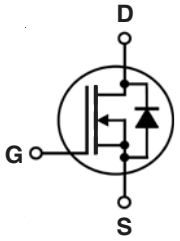
# IXYS

## Depletion Mode MOSFET

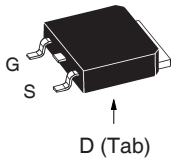
**IXTY08N100D2**
**IXTA08N100D2**
**IXTP08N100D2**

$V_{DSX}$ = 1000V
$I_{D(on)}$ ≥ 800mA
$R_{DS(on)}$ ≤ 21Ω

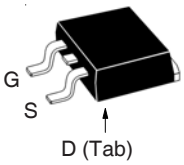
### N-Channel



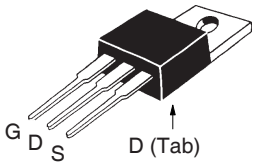

**TO-252 (IXTY)**




**TO-263 AA (IXTA)**




**TO-220AB (IXTP)**




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

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSX}$ | $T_J$ = 25°C to 150°C | 1000 | V |
| $V_{GSX}$ | Continuous | ±20 | V |
| $V_{GSM}$ | Transient | ±30 | V |
| $P_D$ | $T_C$ = 25°C | 60 | 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 |
| $M_d$ | Mounting Torque (TO-220) | 1.13 / 10 | Nm/lb.in. |
| **Weight** | TO-252 | 0.35 | g |
| | TO-263 | 2.50 | g |
| | TO-220 | 3.00 | g |

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $BV_{DSX}$ | $V_{GS}$ = - 5V, $I_D$ = 25μA | 1000 | | | V |
| $V_{GS(off)}$ | $V_{DS}$ = 25V, $I_D$ = 25μA | - 2.0 | | - 4.0 | V |
| $I_{GSX}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | | | ±50 | nA |
| $I_{DSX(off)}$ | $V_{DS}$ = $V_{DSX}$, $V_{GS}$ = - 5V | | | 1 | μA |
| | $T_J$ = 125°C | | | 15 | μA |
| $R_{DS(on)}$ | $V_{GS}$ = 0V, $I_D$ = 400mA, Note 1 | | | 21 | Ω |
| $I_{D(on)}$ | $V_{GS}$ = 0V, $V_{DS}$ = 50V, Note 1 | 800 | | | mA |

### Features

- Normally ON Mode
- International Standard Packages
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- Audio Amplifiers
- Start-up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

© 2017 IXYS CORPORATION, All Rights Reserved

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 30V, $I_D$ = 400mA, Note 1 | 330 | 560 | | mS |
| $C_{iss}$ | $V_{GS}$ = -10V, $V_{DS}$ = 25V, f = 1MHz | | 325 | | pF |
| $C_{oss}$ | | | 24 | | pF |
| $C_{rss}$ | | | 6.5 | | pF |
| $t_{d(on)}$ | **Resistive Switching Times** | | 28 | | ns |
| $t_r$ | $V_{GS}$ = ±5V, $V_{DS}$ = 500V, $I_D$ = 400mA | | 57 | | ns |
| $t_{d(off)}$ | $R_G$ = 10Ω (External) | | 34 | | ns |
| $t_f$ | | | 48 | | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 5V, $V_{DS}$ = 500V, $I_D$ = 400mA | | 14.6 | | nC |
| $Q_{gs}$ | | | 1.2 | | nC |
| $Q_{gd}$ | | | 8.3 | | nC |
| $R_{thJC}$ | | | | 2.08 | °C/W |
| $R_{thCS}$ | TO-220 | | 0.50 | | °C/W |

**Safe-Operating-Area Specification**

| Symbol | Test Conditions | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| **SOA** | $V_{DS}$ = 800V, $I_D$ = 45mA, $T_C$ = 75°C, Tp = 5s | 36 | | | W |

**Source-Drain Diode**

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $V_{SD}$ | $I_F$ = 800mA, $V_{GS}$ = -10V, Note 1 | | 0.8 | 1.3 | V |
| $t_{rr}$ | $I_F$ = 800mA, -di/dt = 100A/μs | | 1.03 | | μs |
| $I_{RM}$ | $V_R$ = 100V, $V_{GS}$ = -10V | | 7.40 | | A |
| $Q_{RM}$ | | | 3.80 | | μC |

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

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**

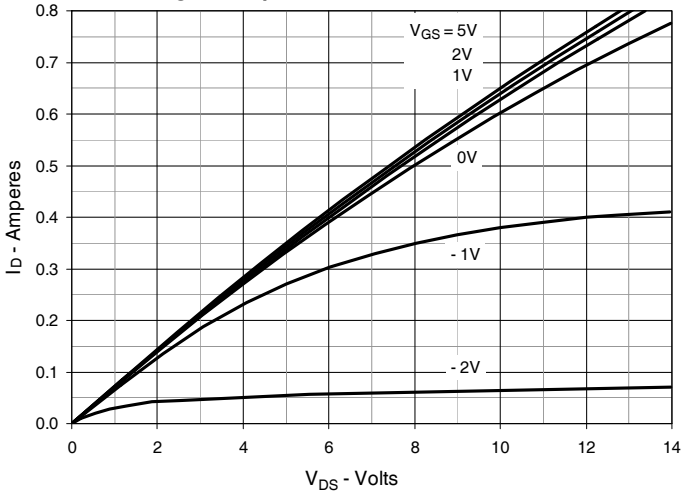



**Fig. 2. Extended Output Characteristics @ $T_J$ = 25°C**

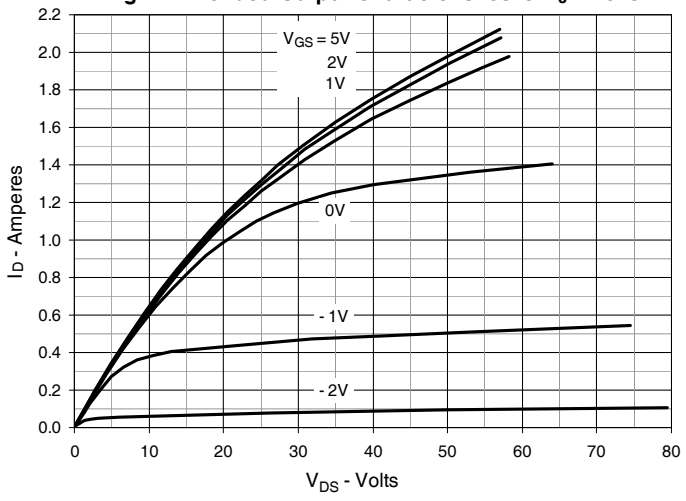



**Fig. 3. Output Characteristics @ $T_J$ = 125°C**

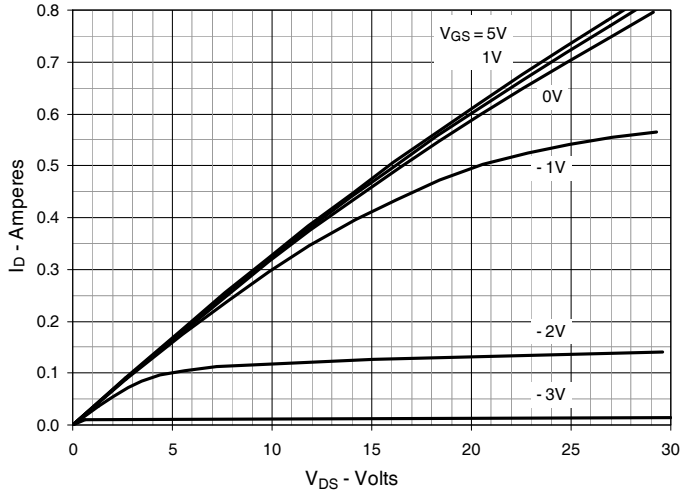



**Fig. 4. Drain Current @ $T_J$ = 25°C**

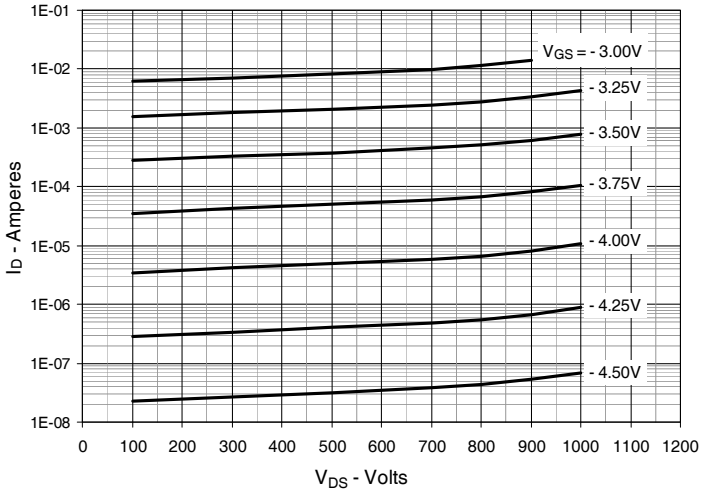



**Fig. 5. Drain Current @ $T_J$ = 100°C**

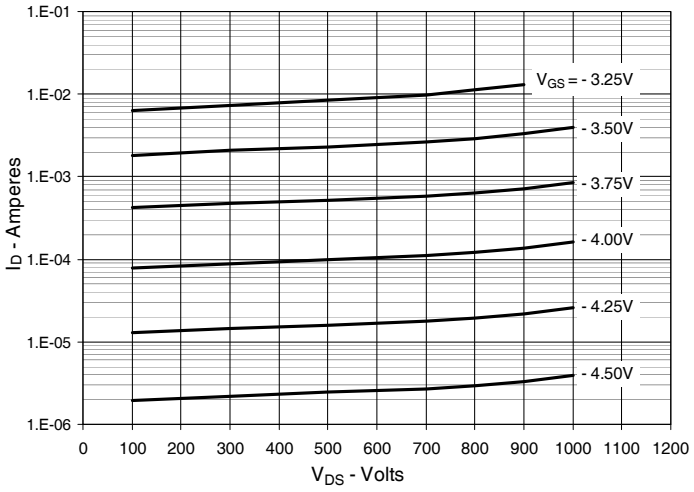
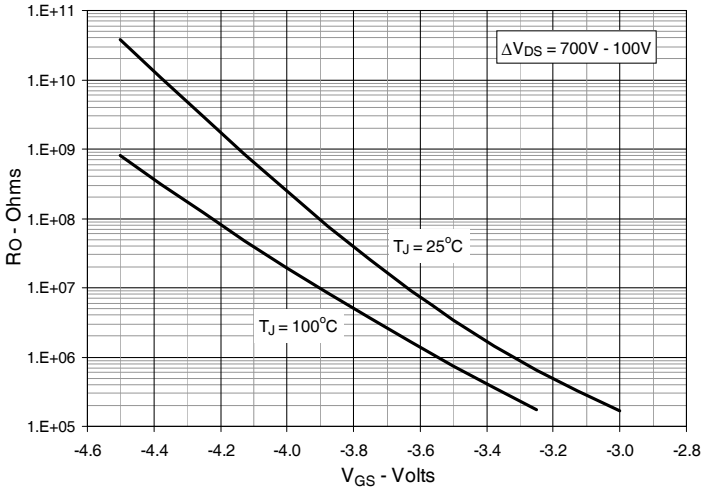



**Fig. 6. Dynamic Resistance vs. Gate Voltage**




© 2017 IXYS CORPORATION, All Rights Reserved

**Fig. 7. Normalized $R_{DS(on)}$ vs. Junction Temperature**

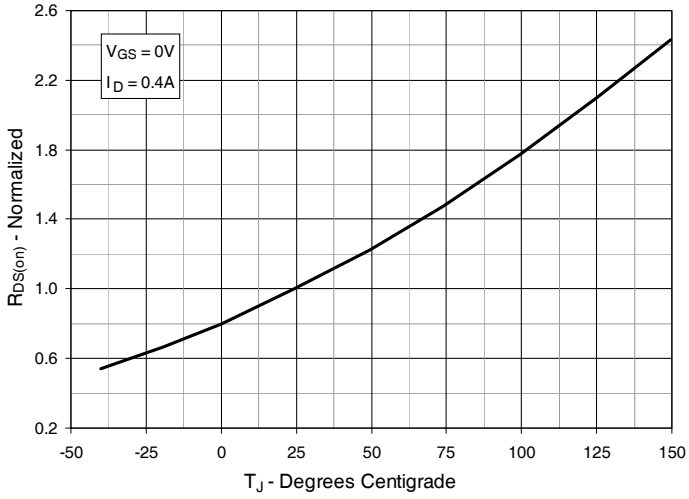



**Fig. 8. $R_{DS(on)}$ Normalized to $I_D$ = 0.4A Value vs. Drain Current**

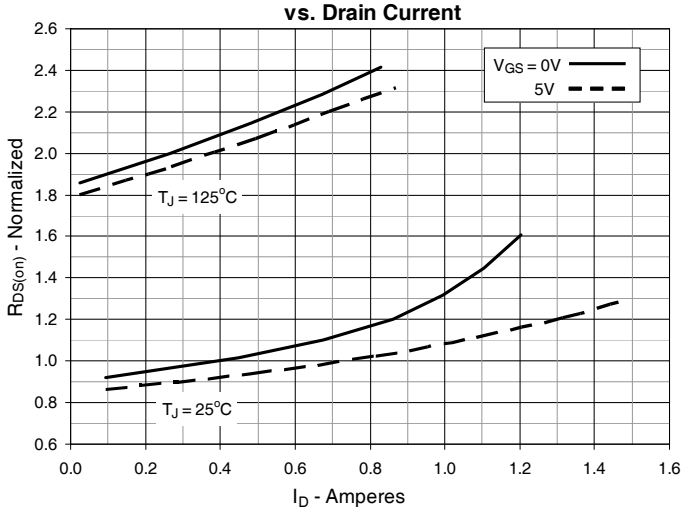



**Fig. 9. Input Admittance**

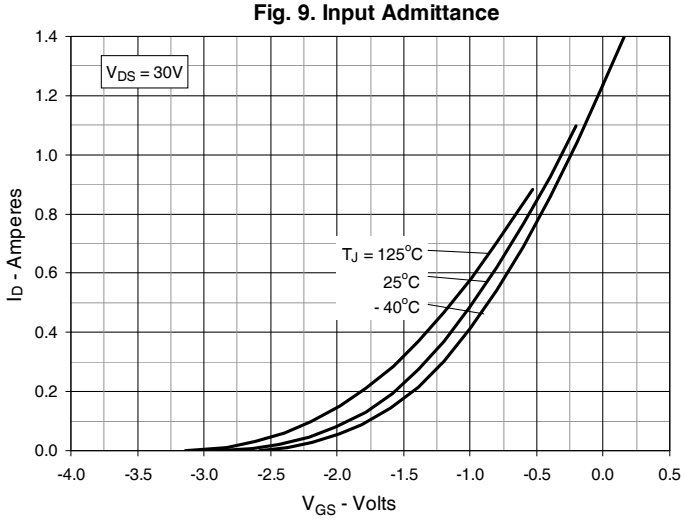



**Fig. 10. Transconductance**

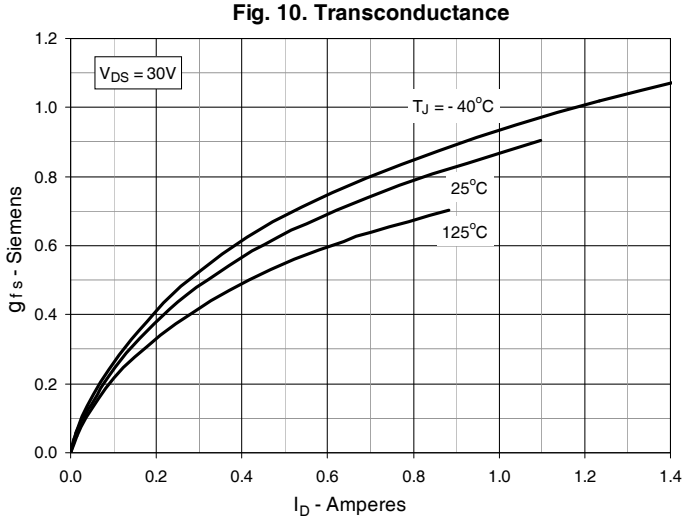



**Fig. 11. Breakdown and Threshold Voltages vs. Junction Temperature**

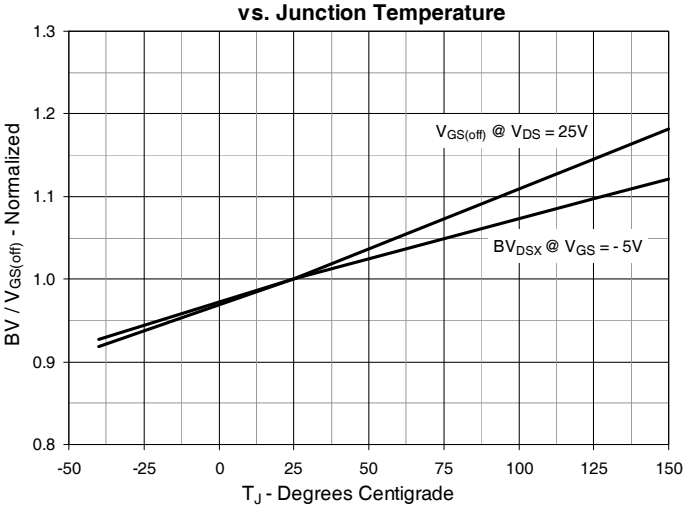
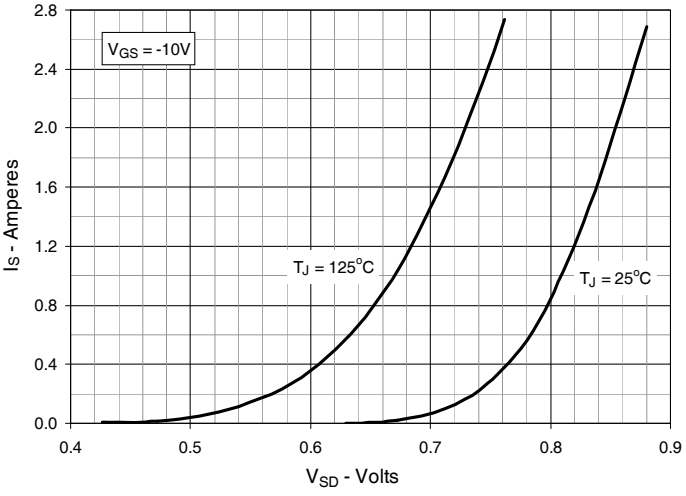



**Fig. 12. Forward Voltage Drop of Intrinsic Diode**




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

**Fig. 13. Capacitance**

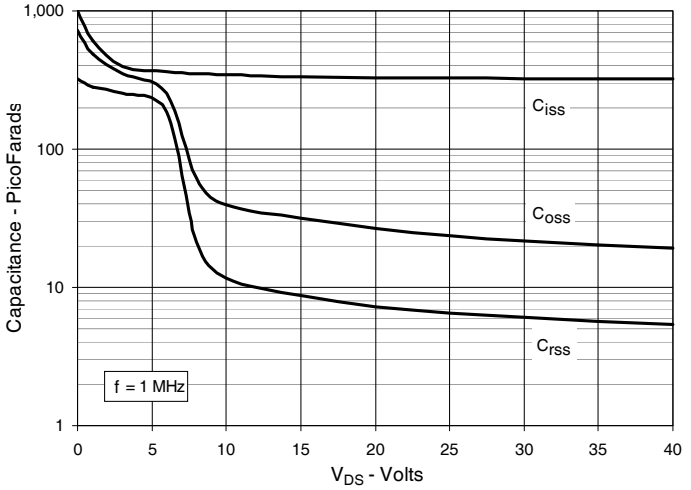



**Fig. 14. Gate Charge**

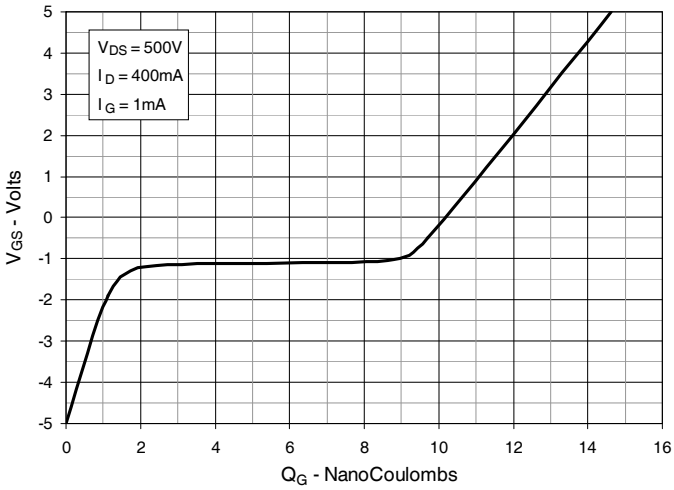



**Fig. 15. Forward-Bias Safe Operating Area @ $T_C$ = 25°C**

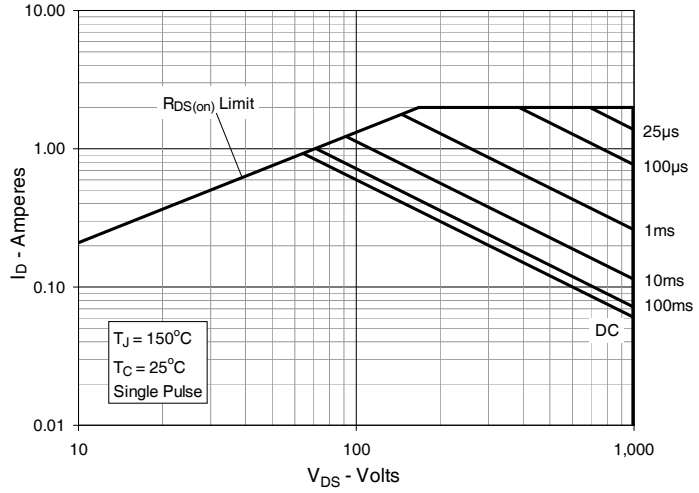



**Fig. 16. Forward-Bias Safe Operating Area @ $T_C$ = 75°C**

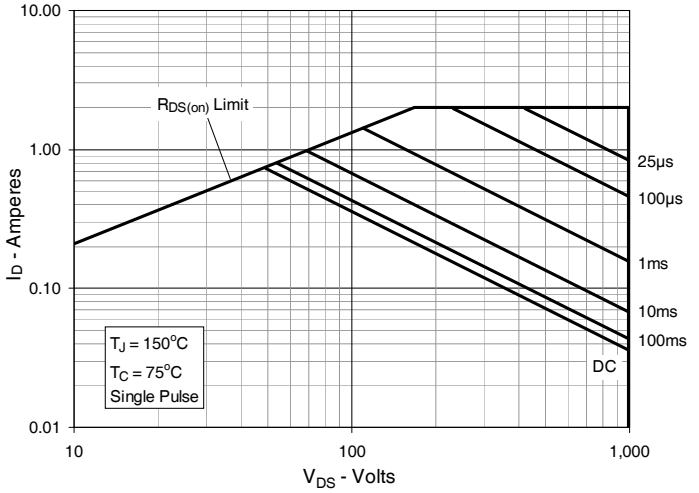
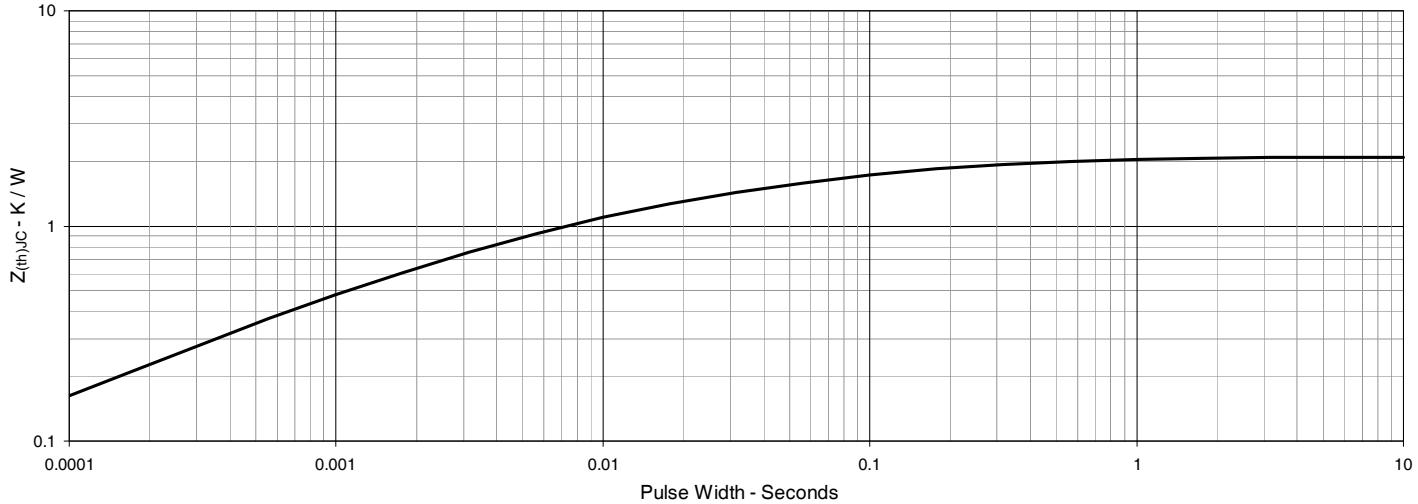
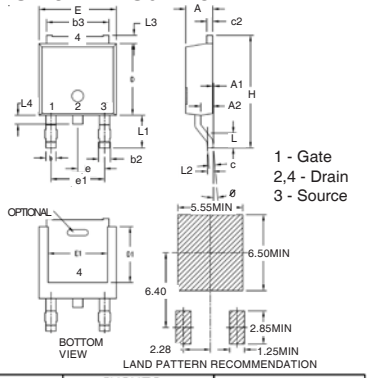



**Fig. 17. Maximum Transient Thermal Impedance**



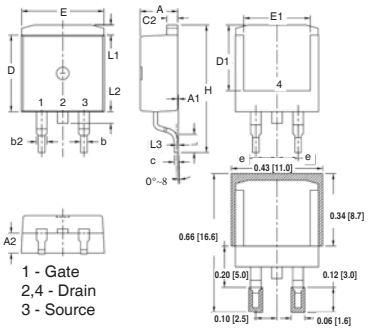

© 2017 IXYS CORPORATION, All Rights Reserved

## TO-252 AA Outline



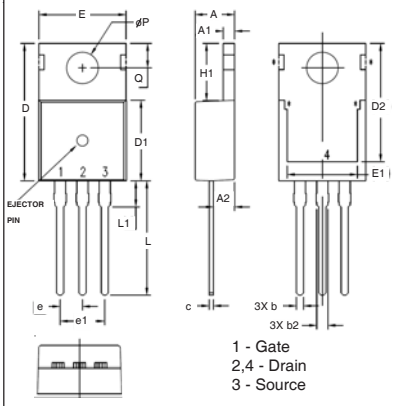

| SYM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | .086 | .094 | 2.19 | 2.38 |
| A1 | 0 | .005 | 0 | 0.12 |
| A2 | .038 | .046 | 0.97 | 1.17 |
| b | .025 | .035 | 0.64 | 0.89 |
| b2 | .030 | .045 | 0.76 | 1.14 |
| b3 | .200 | .215 | 5.08 | 5.46 |
| c | .018 | .024 | 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° |

## TO-263 Outline




| SYM | INCHES | | MILLIMETER | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | .170 | .185 | 4.30 | 4.70 |
| A1 | .000 | .008 | 0.00 | 0.20 |
| A2 | .091 | .098 | 2.30 | 2.50 |
| b | .028 | .035 | 0.70 | 0.90 |
| b2 | .046 | .060 | 1.18 | 1.52 |
| C | .018 | .024 | 0.45 | 0.60 |
| C2 | .049 | .060 | 1.25 | 1.52 |
| D | .340 | .370 | 8.63 | 9.40 |
| D1 | .300 | .327 | 7.62 | 8.30 |
| E | .380 | .410 | 9.65 | 10.41 |
| E1 | .270 | .330 | 6.86 | 8.38 |
| e | .100 BSC | | 2.54 BSC | |
| H | .580 | .620 | 14.73 | 15.75 |
| L | .075 | .105 | 1.91 | 2.67 |
| L1 | .039 | .060 | 1.00 | 1.52 |
| L2 | — | .070 | — | 1.77 |
| L3 | .010 BSC | | 0.254 BSC | |

## TO-220 Outline




| SYM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | .169 | .185 | 4.30 | 4.70 |
| A1 | .047 | .055 | 1.20 | 1.40 |
| A2 | .079 | .106 | 2.00 | 2.70 |
| b | .024 | .039 | 0.60 | 1.00 |
| b2 | .045 | .057 | 1.15 | 1.45 |
| c | .014 | .026 | 0.35 | 0.65 |
| D | .587 | .626 | 14.90 | 15.90 |
| D1 | .335 | .370 | 8.50 | 9.40 |
| (D2) | .500 | .531 | 12.70 | 13.50 |
| E | .382 | .406 | 9.70 | 10.30 |
| (E1) | .283 | .323 | 7.20 | 8.20 |
| e | .100 BSC | | 2.54 BSC | |
| e1 | .200 BSC | | 5.08 BSC | |
| H1 | .244 | .268 | 6.20 | 6.80 |
| L | .492 | .547 | 12.50 | 13.90 |
| L1 | .110 | .154 | 2.80 | 3.90 |
| ØP | .134 | .150 | 3.40 | 3.80 |
| Q | .106 | .126 | 2.70 | 3.20 |

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.