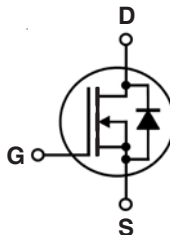


## High Voltage Power MOSFET

**IXTY02N50D**  
**IXTU02N50D**  
**IXTP02N50D**

$V_{DSX} = 500V$   
 $I_{D25} = 200mA$   
 $R_{DS(on)} \leq 30\Omega$

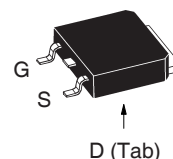
### N-Channel



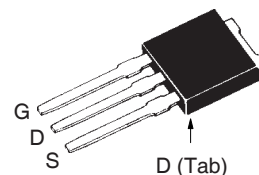
| Symbol     | Test Conditions                                    | Maximum Ratings |             |
|------------|----------------------------------------------------|-----------------|-------------|
| $V_{DSX}$  | $T_J = 25^{\circ}C$ to $150^{\circ}C$              | 500             | V           |
| $V_{DGX}$  | $T_J = 25^{\circ}C$ to $150^{\circ}C$              | 500             | V           |
| $V_{GSX}$  | Continuous                                         | $\pm 20$        | V           |
| $V_{GSM}$  | Transient                                          | $\pm 30$        | V           |
| $I_{D25}$  | $T_C = 25^{\circ}C$                                | 200             | mA          |
| $I_{DM}$   | $T_C = 25^{\circ}C$ , Pulse Width Limited by $T_J$ | 800             | mA          |
| $P_D$      | $T_C = 25^{\circ}C$<br>$T_A = 25^{\circ}C$         | 25<br>1.1       | W<br>W      |
| $T_J$      |                                                    | - 55 ... +150   | $^{\circ}C$ |
| $T_{JM}$   |                                                    | 150             | $^{\circ}C$ |
| $T_{stg}$  |                                                    | - 55 ... +150   | $^{\circ}C$ |
| $T_L$      | Maximum Lead Temperature for Soldering             | 300             | $^{\circ}C$ |
| $T_{SOLD}$ | 1.6 mm (0.062in.) from Case for 10s                | 260             | $^{\circ}C$ |
| $M_d$      | Mounting Torque (TO-220)                           | 1.13 / 10       | Nm/lb.in.   |
| Weight     | TO-252                                             | 0.35            | g           |
|            | TO-251                                             | 0.40            | g           |
|            | TO-220                                             | 3.00            | g           |

| Symbol         | Test Conditions<br>( $T_J = 25^{\circ}C$ , Unless Otherwise Specified) | Characteristic Values |      |                           |
|----------------|------------------------------------------------------------------------|-----------------------|------|---------------------------|
|                |                                                                        | Min.                  | Typ. | Max.                      |
| $BV_{DSX}$     | $V_{GS} = -10V$ , $I_D = 25\mu A$                                      | 500                   |      | V                         |
| $V_{GS(off)}$  | $V_{DS} = 25V$ , $I_D = 25\mu A$                                       | - 2.5                 |      | - 5.0 V                   |
| $I_{GSX}$      | $V_{GS} = \pm 20V$ , $V_{DS} = 0V$                                     |                       |      | $\pm 100$ nA              |
| $I_{DSX(off)}$ | $V_{DS} = V_{DSX}$ , $V_{GS} = -10V$<br>$T_J = 125^{\circ}C$           |                       |      | 10 $\mu A$<br>250 $\mu A$ |
| $R_{DS(on)}$   | $V_{GS} = 0V$ , $I_D = 50mA$ , Note 1                                  |                       | 20   | 30 $\Omega$               |
| $I_{D(on)}$    | $V_{GS} = 0V$ , $V_{DS} = 25V$ , Note 1                                |                       | 250  | mA                        |

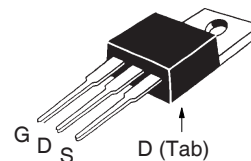
#### TO-252 (IXTY)



#### TO-251 (IXTU)



#### TO-220AB (IXTP)



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

### Features

- Normally ON Mode
- International Standard Packages
- Low  $R_{DS(on)}$  HDMOS™ Process
- Rugged Polysilicon Gate Cell Structure
- Fast Switching Speed

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

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

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)                                                                | Characteristic Values |      |                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|------------------------|
|              |                                                                                                                                            | Min.                  | Typ. | Max.                   |
| $g_{fs}$     | $V_{DS} = 50\text{V}$ , $I_D = 200\text{mA}$ , Note 1                                                                                      | 100                   | 150  | mS                     |
| $C_{iss}$    | $V_{GS} = -10\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$                                                                         |                       | 120  | pF                     |
| $C_{oss}$    |                                                                                                                                            |                       | 25   | pF                     |
| $C_{rss}$    |                                                                                                                                            |                       | 5    | pF                     |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = \pm 5\text{V}$ , $V_{DS} = 100\text{V}$ , $I_D = 50\text{mA}$<br>$R_G = 30\Omega$ (External) |                       | 9    | ns                     |
| $t_r$        |                                                                                                                                            |                       | 4    | ns                     |
| $t_{d(off)}$ |                                                                                                                                            |                       | 28   | ns                     |
| $t_f$        |                                                                                                                                            |                       | 45   | ns                     |
| $R_{thJC}$   | TO-220                                                                                                                                     |                       |      | 5.0 $^\circ\text{C/W}$ |
| $R_{thCS}$   |                                                                                                                                            | 0.50                  |      | $^\circ\text{C/W}$     |

### Source-Drain Diode

| Symbol   | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)                              | Characteristic Values |      |                   |
|----------|----------------------------------------------------------------------------------------------------------|-----------------------|------|-------------------|
|          |                                                                                                          | Min.                  | Typ. | Max.              |
| $V_{SD}$ | $I_F = 200\text{mA}$ , $V_{GS} = -10\text{V}$ , Note 1                                                   |                       | 0.7  | 1.5 V             |
| $t_{rr}$ | $I_F = 750\text{mA}$ , $-di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 25\text{V}$ , $V_{GS} = -10\text{V}$ |                       |      | 1.0 $\mu\text{s}$ |

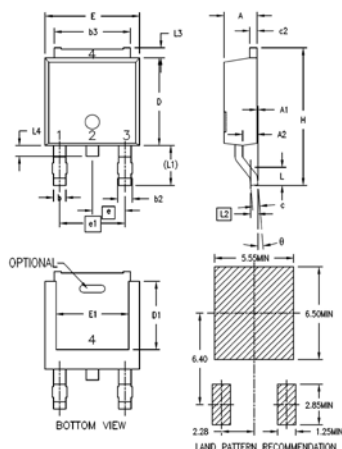
Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

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 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665    | 6,404,065 B1 | 6,683,344    | 6,727,585    | 7,005,734 B2 | 7,157,338B2 |
| 4,860,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343    | 6,710,405 B2 | 6,759,692    | 7,063,975 B2 |             |
| 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505    | 6,710,463    | 6,771,478 B2 | 7,071,537    |             |

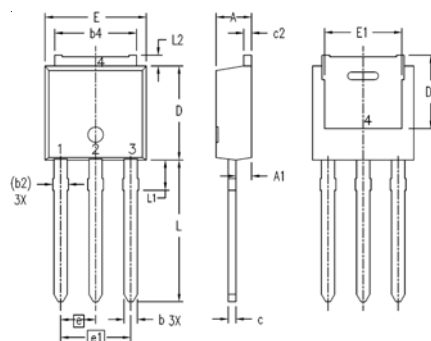
### TO-252 AA (IXTY) Outline



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

| 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°         |       |

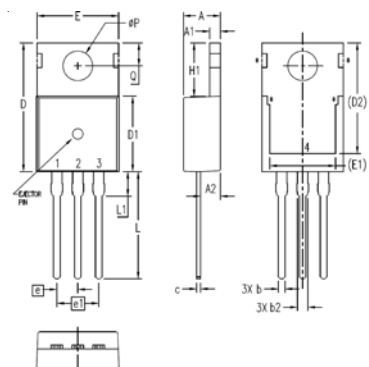
### TO-251 AA (IXTU) Outline



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

| SYM  | INCHES   |      | MILLIMETERS |      |
|------|----------|------|-------------|------|
|      | MIN      | MAX  | MIN         | MAX  |
| A    | .087     | .094 | 2.20        | 2.40 |
| A1   | .032     | .048 | 0.82        | 1.22 |
| b    | .026     | .034 | 0.66        | 0.86 |
| (b2) | .030     | .038 | 0.76        | 0.96 |
| b4   | .198     | .222 | 5.04        | 5.64 |
| c    | .018     | .024 | 0.45        | 0.60 |
| c2   | .016     | .024 | 0.40        | 0.60 |
| D    | .232     | .248 | 5.90        | 6.30 |
| (D1) | .179     | .195 | 4.55        | 4.95 |
| E    | .252     | .268 | 6.40        | 6.80 |
| (E1) | .191     | .207 | 4.85        | 5.25 |
| e    | .090 BSC |      | 2.28 BSC    |      |
| e1   | .180 BSC |      | 4.57 BSC    |      |
| L    | .358     | .374 | 9.10        | 9.50 |
| L1   | .063     | .079 | 1.60        | 2.00 |
| L2   | .020     | .035 | 0.50        | 0.90 |

### TO-220 (IXTP) Outline



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

| 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  |

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[IXYS:](#)

[IXTP02N50D](#) [IXTU02N50D](#) [IXTY02N50D](#) [IXTY02N50D\\_TRL](#)