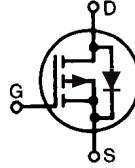


# Standard Power MOSFET

P-Channel Enhancement Mode  
Avalanche Rated

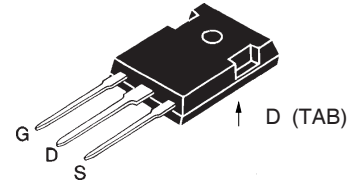
**IXTH 8P50**  
**IXTT 8P50**

$$\begin{aligned} V_{DSS} &= -500 \text{ V} \\ I_{D25} &= -8 \text{ A} \\ R_{DS(on)} &= 1.2 \Omega \end{aligned}$$

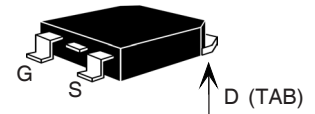


| Symbol    | Test Conditions                                                                 | Maximum Ratings |                  |
|-----------|---------------------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$ | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                                 | -500            | V                |
| $V_{DGR}$ | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$  | -500            | V                |
| $V_{GS}$  | Continuous                                                                      | $\pm 20$        | V                |
| $V_{GSM}$ | Transient                                                                       | $\pm 30$        | V                |
| $I_{D25}$ | $T_C = 25^\circ\text{C}$                                                        | -8              | A                |
| $I_{DM}$  | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_J$                         | -32             | A                |
| $I_{AR}$  | $T_C = 25^\circ\text{C}$                                                        | -8              | A                |
| $E_{AR}$  | $T_C = 25^\circ\text{C}$                                                        | 30              | mJ               |
| $P_D$     | $T_C = 25^\circ\text{C}$                                                        | 180             | W                |
| $T_J$     |                                                                                 | -55 ... +150    | $^\circ\text{C}$ |
| $T_{JM}$  |                                                                                 | 150             | $^\circ\text{C}$ |
| $T_{stg}$ |                                                                                 | -55 ... +150    | $^\circ\text{C}$ |
|           | Maximum lead temperature for soldering<br>1.6 mm (0.062 in.) from case for 10 s | 300             | $^\circ\text{C}$ |
|           | Plastic Body for 10s                                                            | 250             | $^\circ\text{C}$ |
| $M_d$     | Mounting torque (TO-247)                                                        | 1.13/10         | Nm/lb.in.        |
| Weight    | TO-247                                                                          | 6               | g                |
|           | TO-268                                                                          | 5               | g                |

TO-247 (IXTH)



TO-268 (IXTT)



G = Gate, D = Drain,  
S = Source, TAB = Drain

## Features

- International standard packages
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance (<5 nH)  
- easy to drive and to protect

## Applications

- High side switching
- Push-pull amplifiers
- DC choppers
- Automatic test equipment

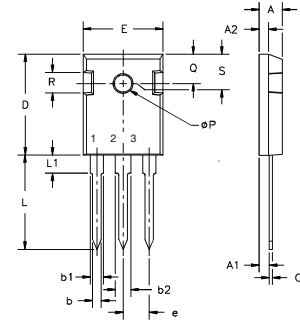
## Advantages

- Easy to mount with 1 screw  
(isolated mounting screw hole)
- Space savings
- High power density

| Symbol       | Test Conditions                                                                                                 | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |        |                             |
|--------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-----------------------------|
|              |                                                                                                                 | min.                                                                              | typ.   | max.                        |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = -250 \mu\text{A}$<br>$BV_{DSS}$ Temperature Coefficient                         | -500                                                                              | 0.054  | V<br>%/K                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = -250 \mu\text{A}$<br>$V_{GS(th)}$ Temperature Coefficient                            | -3.0                                                                              | -0.122 | V<br>%/K                    |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$                                                                 |                                                                                   |        | $\pm 100$ nA                |
| $I_{DSS}$    | $V_{DS} = 0.8 \cdot V_{DSS}$<br>$V_{GS} = 0 \text{ V}$<br>$T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$ |                                                                                   |        | -200 $\mu\text{A}$<br>-1 mA |
| $R_{DS(on)}$ | $V_{GS} = -10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$ 7P50                                                       |                                                                                   |        | 1.5 $\Omega$                |
|              | 8P50                                                                                                            |                                                                                   |        | 1.2 $\Omega$                |
|              | $R_{DS(on)}$ Temperature Coefficient                                                                            |                                                                                   |        | 0.6 %/K                     |

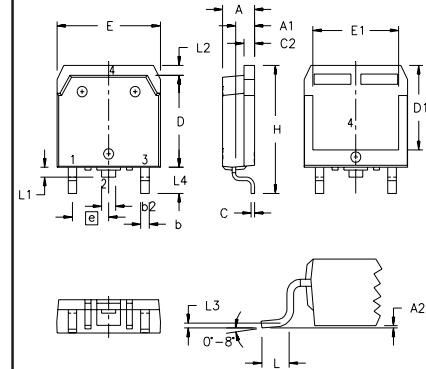
| Symbol       | Test Conditions                                                                                          | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |      |
|--------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|
|              |                                                                                                          | min.                                                                              | typ. | max. |
| $g_{fs}$     | $V_{DS} = -10\text{ V}$ ; $I_D = I_{D25}$ , pulse test                                                   | 4                                                                                 | 5    | S    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}$ , $V_{DS} = -25\text{ V}$ , $f = 1\text{ MHz}$                                     |                                                                                   | 3400 | pF   |
| $C_{oss}$    |                                                                                                          |                                                                                   | 450  | pF   |
| $C_{rss}$    |                                                                                                          |                                                                                   | 175  | pF   |
| $t_{d(on)}$  | $V_{GS} = -10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 0.5 I_{D25}$<br>$R_G = 4.7\ \Omega$ (External) |                                                                                   | 33   | ns   |
| $t_r$        |                                                                                                          |                                                                                   | 27   | ns   |
| $t_{d(off)}$ |                                                                                                          |                                                                                   | 35   | ns   |
| $t_f$        |                                                                                                          |                                                                                   | 35   | ns   |
| $Q_{g(on)}$  | $V_{GS} = -10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 0.5 I_{D25}$                                   |                                                                                   | 130  | nC   |
| $Q_{gs}$     |                                                                                                          |                                                                                   | 32   | nC   |
| $Q_{gd}$     |                                                                                                          |                                                                                   | 64   | nC   |
| $R_{thJC}$   |                                                                                                          |                                                                                   | 0.7  | K/W  |
| $R_{thCS}$   | (TO-247)                                                                                                 |                                                                                   | 0.25 | K/W  |

| Source-Drain Diode |                                                                                                          | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |       |
|--------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------|
| Symbol             | Test Conditions                                                                                          | min.                                                                              | typ. | max.  |
| $I_S$              | $V_{GS} = 0$                                                                                             |                                                                                   |      | -8 A  |
| $I_{SM}$           | Repetitive; pulse width limited by $T_{JM}$                                                              |                                                                                   |      | -32 A |
| $V_{SD}$           | $I_F = I_S$ , $V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |                                                                                   |      | -3 V  |
| $t_{rr}$           | $I_F = I_S$ , $di/dt = 100\text{ A}/\mu\text{s}$                                                         |                                                                                   | 400  | ns    |

**TO-247 (IXTH) Outline**


Terminals: 1 - Gate 2 - Drain  
3 - Source Tab - Drain

| Dim.           | Millimeter |       | Inches |       |
|----------------|------------|-------|--------|-------|
|                | Min.       | Max.  | Min.   | Max.  |
| A              | 4.7        | 5.3   | .185   | .209  |
| A <sub>1</sub> | 2.2        | 2.54  | .087   | .102  |
| A <sub>2</sub> | 2.2        | 2.6   | .059   | .098  |
| b              | 1.0        | 1.4   | .040   | .055  |
| b <sub>1</sub> | 1.65       | 2.13  | .065   | .084  |
| b <sub>2</sub> | 2.87       | 3.12  | .113   | .123  |
| C              | .4         | .8    | .016   | .031  |
| D              | 20.80      | 21.46 | .819   | .845  |
| E              | 15.75      | 16.26 | .610   | .640  |
| e              | 5.20       | 5.72  | 0.205  | 0.225 |
| L              | 19.81      | 20.32 | .780   | .800  |
| L <sub>1</sub> |            | 4.50  |        | .177  |
| ØP             | 3.55       | 3.65  | .140   | .144  |
| Q              | 5.89       | 6.40  | 0.232  | 0.252 |
| R              | 4.32       | 5.49  | .170   | .216  |
| S              | 6.15       | BSC   | .242   | BSC   |

**TO-268 (IXTT) Outline**


| SYM            | INCHES   |      | MILLIMETERS |       |
|----------------|----------|------|-------------|-------|
|                | MIN      | MAX  | MIN         | MAX   |
| A              | .193     | .201 | 4.90        | 5.10  |
| A <sub>1</sub> | .106     | .114 | 2.70        | 2.90  |
| A <sub>2</sub> | .001     | .010 | 0.02        | 0.25  |
| b              | .045     | .057 | 1.15        | 1.45  |
| b <sub>2</sub> | .075     | .083 | 1.90        | 2.10  |
| C              | .016     | .026 | 0.40        | 0.65  |
| C <sub>2</sub> | .057     | .063 | 1.45        | 1.60  |
| D              | .543     | .551 | 13.80       | 14.00 |
| D <sub>1</sub> | .488     | .500 | 12.40       | 12.70 |
| E              | .624     | .632 | 15.85       | 16.05 |
| E <sub>1</sub> | .524     | .535 | 13.30       | 13.60 |
| e              | .215 BSC |      | 5.45 BSC    |       |
| H              | .736     | .752 | 18.70       | 19.10 |
| L              | .094     | .106 | 2.40        | 2.70  |
| L <sub>1</sub> | .047     | .055 | 1.20        | 1.40  |
| L <sub>2</sub> | .039     | .045 | 1.00        | 1.15  |
| L <sub>3</sub> | .010     | BSC  | 0.25        | BSC   |
| L <sub>4</sub> | .150     | .161 | 3.80        | 4.10  |

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 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665    | 6,404,065 B1 |
| 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343    |
| 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505    |

|              |              |
|--------------|--------------|
| 6,683,344    | 6,727,585    |
| 6,710,405 B2 | 6,759,692    |
| 6,710,463    | 6,771,478 B2 |



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