

# HiPerFET™

## Power MOSFETs

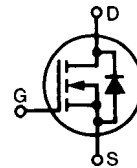
### Q-Class

IXFH 75N10Q  
IXFT 75N10Q

$V_{DSS} = 100 \text{ V}$   
 $I_{D25} = 75 \text{ A}$   
 $R_{DS(on)} = 20 \text{ m}\Omega$

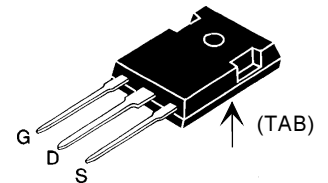
$t_{rr} \leq 200 \text{ ns}$

N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt  
Low Gate Charge and Capacitances

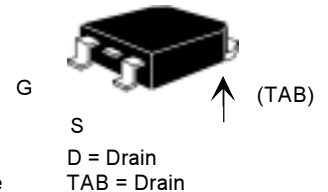


| Symbol    | Test Conditions                                                                                                                         | Maximum Ratings |                  |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$ | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$                                                                                          | 100             | V                |
| $V_{DGR}$ | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$                                                              | 100             | V                |
| $V_{GS}$  | Continuous                                                                                                                              | $\pm 20$        | V                |
| $V_{GSM}$ | Transient                                                                                                                               | $\pm 30$        | V                |
| $I_{D25}$ | $T_C = 25^\circ\text{C}$                                                                                                                | 75              | A                |
| $I_{DM}$  | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                                              | 300             | A                |
| $I_{AR}$  | $T_C = 25^\circ\text{C}$                                                                                                                | 75              | A                |
| $E_{AR}$  | $T_C = 25^\circ\text{C}$                                                                                                                | 30              | mJ               |
| $E_{AS}$  | $T_C = 25^\circ\text{C}$                                                                                                                | 1.5             | J                |
| dv/dt     | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 5               | V/ns             |
| $P_D$     | $T_C = 25^\circ\text{C}$                                                                                                                | 300             | W                |
| $T_J$     |                                                                                                                                         | -55 ... +150    | $^\circ\text{C}$ |
| $T_{JM}$  |                                                                                                                                         | 150             | $^\circ\text{C}$ |
| $T_{stg}$ |                                                                                                                                         | -55 ... +150    | $^\circ\text{C}$ |
| $T_L$     | 1.6 mm (0.062 in.) from case for 10 s                                                                                                   | 300             | $^\circ\text{C}$ |
| $M_d$     | Mounting torque                                                                                                                         | 1.13/10         | Nm/lb.in.        |
| Weight    | TO-247 AD                                                                                                                               | 6               | g                |
|           | TO-268                                                                                                                                  | 4               | g                |

TO-247 AD (IXFH)



TO-268 (IXFT) Case Style



#### Features

- IXYS advanced low gate charge process
- International standard packages
- Low gate charge and capacitance
  - easier to drive
  - faster switching
- Low  $R_{DS(on)}$
- Unclamped Inductive Switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

#### Advantages

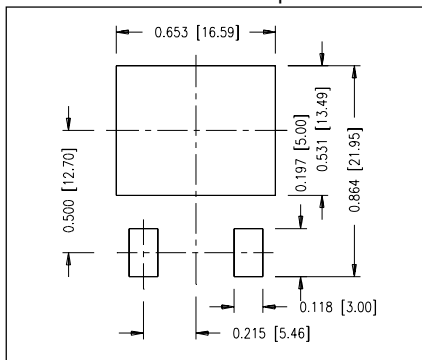
- Easy to mount
- Space savings
- High power density

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                      | Characteristic Values |      |                      |
|--------------|------------------------------------------------------------------------------------------------------------------|-----------------------|------|----------------------|
|              |                                                                                                                  | Min.                  | Typ. | Max.                 |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$                                                                 | 100                   |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 4 \text{ mA}$                                                                         | 2.0                   |      | 4 V                  |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$                                                                  |                       |      | $\pm 100 \text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $T_J = 25^\circ\text{C}$                                                                    |                       |      | 25 $\mu\text{A}$     |
|              | $V_{GS} = 0 \text{ V}$ , $T_J = 125^\circ\text{C}$                                                               |                       |      | 1 mA                 |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2 \%$ |                       |      | 20 m $\Omega$        |

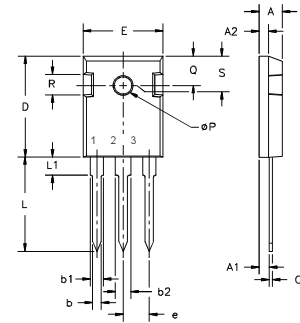
| Symbol       | Test Conditions                                                                                   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |         |
|--------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------|
|              |                                                                                                   | Min.                                                                              | Typ. | Max.    |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ , pulse test                                            | 30                                                                                | 45   | S       |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                                     |                                                                                   | 3700 | pF      |
| $C_{oss}$    |                                                                                                   |                                                                                   | 1300 | pF      |
| $C_{rss}$    |                                                                                                   |                                                                                   | 425  | 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) |                                                                                   | 31   | ns      |
| $t_r$        |                                                                                                   |                                                                                   | 65   | ns      |
| $t_{d(off)}$ |                                                                                                   |                                                                                   | 65   | ns      |
| $t_f$        |                                                                                                   |                                                                                   | 28   | ns      |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$                                   |                                                                                   | 140  | nC      |
| $Q_{gs}$     |                                                                                                   |                                                                                   | 30   | nC      |
| $Q_{gd}$     |                                                                                                   |                                                                                   | 65   | nC      |
| $R_{thJC}$   | (TO-247)                                                                                          |                                                                                   | 0.25 | 0.42 KW |
| $R_{thCK}$   |                                                                                                   |                                                                                   |      | KW      |

| Source-Drain Diode |                                                                                                       | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|--------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------|
| Symbol             | Test Conditions                                                                                       | min.                                                                              | typ. | max.          |
| $I_S$              | $V_{GS} = 0\text{ V}$                                                                                 |                                                                                   |      | 75 A          |
| $I_{SM}$           | Repetitive;                                                                                           |                                                                                   |      | 300 A         |
| $V_{SD}$           | $I_F = I_S, V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |                                                                                   |      | 1.5 V         |
| $t_{rr}$           | $I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 50\text{ V}$                             |                                                                                   | 0.85 | 200 ns        |
| $Q_{RM}$           |                                                                                                       |                                                                                   |      | $\mu\text{C}$ |
| $I_{RM}$           |                                                                                                       |                                                                                   |      | A             |

## Min Recommended Footprint



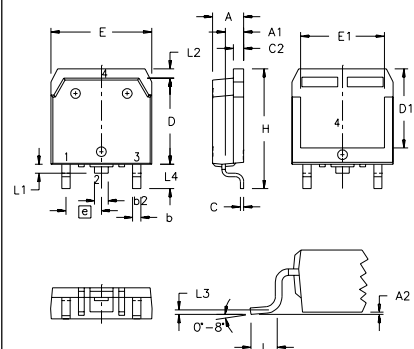
## TO-247 AD Outline



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

| Dim. | Millimeter |       | Inches  |       |
|------|------------|-------|---------|-------|
|      | Min.       | Max.  | Min.    | Max.  |
| A    | 4.7        | 5.3   | .185    | .209  |
| A1   | 2.2        | 2.54  | .087    | .102  |
| A2   | 2.2        | 2.6   | .059    | .098  |
| b    | 1.0        | 1.4   | .040    | .055  |
| b1   | 1.65       | 2.13  | .065    | .084  |
| b2   | 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  |
| L1   |            | 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 Outline



| SYM | INCHES   |      | MILLIMETERS |       |
|-----|----------|------|-------------|-------|
|     | MIN      | MAX  | MIN         | MAX   |
| A   | .193     | .201 | 4.90        | 5.10  |
| A1  | .106     | .114 | 2.70        | 2.90  |
| A2  | .001     | .010 | 0.02        | 0.25  |
| b   | .045     | .057 | 1.15        | 1.45  |
| b2  | .075     | .083 | 1.90        | 2.10  |
| C   | .016     | .026 | 0.40        | 0.65  |
| C2  | .057     | .063 | 1.45        | 1.60  |
| D   | .543     | .551 | 13.80       | 14.00 |
| D1  | .488     | .500 | 12.40       | 12.70 |
| E   | .624     | .632 | 15.85       | 16.05 |
| E1  | .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  |
| L1  | .047     | .055 | 1.20        | 1.40  |
| L2  | .039     | .045 | 1.00        | 1.15  |
| L3  | .010 BSC |      | 0.25 BSC    |       |
| L4  | .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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715  
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025



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