

# HiPerFET™ Power MOSFETs Single Die MOSFET

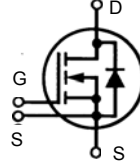
## IXFE 80N50

$$V_{DSS} = 500 \text{ V}$$

$$I_{D25} = 72 \text{ A}$$

$$R_{DS(on)} = 55 \text{ m}\Omega$$

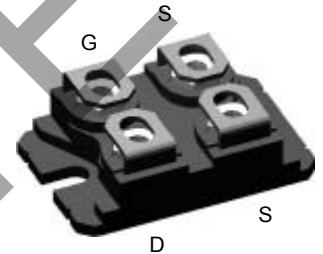
N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt, Low  $t_{rr}$



### Preliminary data sheet

| 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                      |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$ , Chip capability  | 72               | A                      |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , Note 1   | 320              | A                      |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$  | 80               | A                      |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$  | 64               | mJ                     |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$  | 6                | 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                   |
| $P_D$      | $T_C = 25^\circ\text{C}$  | 580              | W                      |
| $T_J$      |   | -40 ... +150     | $^\circ\text{C}$       |
| $T_{JM}$   |   | 150              | $^\circ\text{C}$       |
| $T_{stg}$  |   | -40 ... +150     | $^\circ\text{C}$       |
| $V_{ISOL}$ | 50/60 Hz, RMS $t = 1 \text{ min}$<br>$I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$   | 2500<br>3000     | V~<br>V~               |
| $M_d$      | Mounting torque<br>Terminal connection torque   | 1.5/13<br>1.5/13 | Nm/lb.in.<br>Nm/lb.in. |
| Weight     |   | 19               | g                      |

### ISOPLUS 227™ (IXFE)



G = Gate  
S = Source  
D = Drain

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

### Features

- Conforms to SOT-227B outline
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

### Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

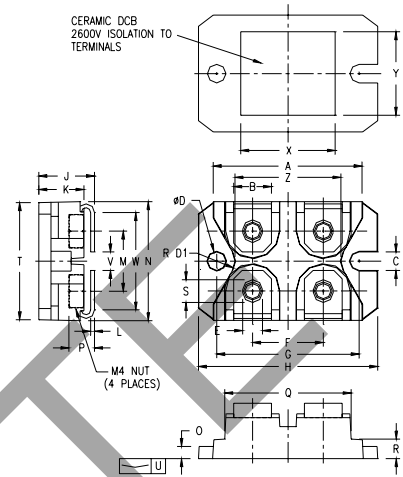
### Advantages

- Low cost
- Easy to mount
- Space savings
- High power density

| Symbol       | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|--------------|---|---|------|---------------------------|
|              |   | min.  | typ. | max.                      |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$   | 500   |      | V                         |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$  | 2.5   |      | V                         |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$   |   |      | $\pm 200 \text{ nA}$      |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $T_J = 25^\circ\text{C}$<br>$V_{GS} = 0 \text{ V}$ , $T_J = 125^\circ\text{C}$ |   |      | 100 $\mu\text{A}$<br>2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = I_T$<br>Note 2   |   |      | 55 m $\Omega$             |

| Symbol       | Test Conditions  | Characteristic Values<br>( $T_j = 25^\circ\text{C}$ , unless otherwise specified) |      |      |
|--------------|--|---|------|------|
|              |  | min.  | typ. | max. |
| $g_{fs}$     | $V_{DS} = 15\text{ V}; I_D = I_T$ , Note 2   | 50  | 70   | S    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                                  |   | 9890 | pF   |
| $C_{oss}$    |  |   | 1750 | pF   |
| $C_{rss}$    |  |   | 460  | pF   |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$<br>$R_G = 1\ \Omega$ (External), |   | 61   | ns   |
| $t_r$        |  |   | 70   | ns   |
| $t_{d(off)}$ |  |   | 102  | ns   |
| $t_f$        |  |   | 27   | ns   |
| $Q_{G(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$                                  |   | 380  | nC   |
| $Q_{GS}$     |  |   | 80   | nC   |
| $Q_{GD}$     |  |   | 173  | nC   |
| $R_{thJC}$   |  |   | 0.22 | K/W  |
| $R_{thCK}$   |  |   | 0.07 | K/W  |

### ISOPLUS-227 B



| SYM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 1.240  | 1.270 | 31.50       | 32.26 |
| B   | .310   | .330  | 7.87        | 8.38  |
| C   | .155   | .165  | 3.94        | 4.19  |
| D   | .155   | .165  | 3.94        | 4.19  |
| D1  | .150   | .157  | 3.81        | 3.98  |
| E   | .160   | .168  | 4.06        | 4.27  |
| F   | .587   | .595  | 14.91       | 15.11 |
| G   | 1.186  | 1.193 | 30.12       | 30.30 |
| H   | 1.489  | 1.505 | 37.80       | 38.23 |
| J   | .465   | .481  | 11.81       | 12.22 |
| K   | .370   | .380  | 9.40        | 9.65  |
| L   | .030   | .033  | 0.76        | 0.84  |
| M   | .496   | .506  | 12.60       | 12.85 |
| N   | .990   | 1.001 | 25.15       | 25.42 |
| O   | .100   | .105  | 2.54        | 2.67  |
| P   | .195   | .235  | 4.95        | 5.97  |
| Q   | 1.045  | 1.059 | 26.54       | 26.90 |
| R   | .160   | .170  | 4.06        | 4.32  |
| S   | .186   | .191  | 4.72        | 4.85  |
| T   | .968   | .987  | 24.59       | 25.07 |
| U   | -.001  | .002  | -0.03       | 0.05  |
| V   | .130   | .160  | 3.30        | 4.06  |
| W   | .780   | .830  | 19.81       | 21.08 |
| X   | .770   | .810  | 19.56       | 20.57 |
| Y   | .680   | .720  | 17.27       | 18.29 |
| Z   | .885   | .892  | 22.48       | 22.66 |

| Source-Drain Diode |   | Characteristic Values<br>( $T_j = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|--------------------|---|---|------|---------------|
| Symbol             | Test Conditions   | min.  | typ. | max.          |
| $I_S$              | $V_{GS} = 0\text{ V}$   |   |      | 80 A          |
| $I_{SM}$           | Repetitive;<br>pulse width limited by $T_{JM}$  |   |      | 320 A         |
| $V_{SD}$           | $I_F = I_S, V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |   |      | 1.3 V         |
| $t_{rr}$           | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                            |   |      | 250 ns        |
| $Q_{RM}$           |   |   | 1.2  | $\mu\text{C}$ |
| $I_{RM}$           |   |   | 8    | A             |

- Notes:
1. Pulse width limited by  $T_{JM}$ .
  2. Pulse test,  $t \leq 300\text{ ms}$ , duty cycle  $d \leq 2\%$ .
  3.  $I_T$  Test current:  $I_T = 40\text{ A}$

IXYS reserves the right to change limits, test conditions, and dimensions.