

# HiPerFET™ Power MOSFET

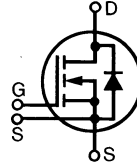
Single MOSFET Die

Preliminary data sheet

IXFE 24N100  
IXFE 23N100

| $V_{DSS}$ | $I_{D25}$ | $R_{DS(on)}$  |
|-----------|-----------|---------------|
| 1000 V    | 22 A      | 0.39 $\Omega$ |
| 1000 V    | 21 A      | 0.43 $\Omega$ |

$t_{rr} \leq 250$  ns

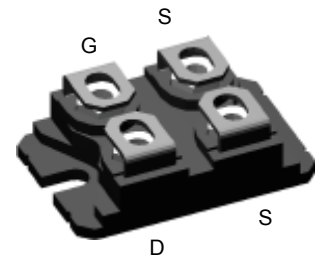


## Symbol Test Conditions

## Maximum Ratings

|               |  |                                      |                  |
|---------------|--|--------------------------------------|------------------|
| $V_{DSS}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$  | 1000                                 | V                |
| $V_{DGR}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1\text{M}\Omega$   | 1000                                 | V                |
| $V_{GS}$      | Continuous   | $\pm 20$                             | V                |
| $V_{GSM}$     | Transient  | $\pm 30$                             | V                |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$   | 24N100: 22<br>23N100: 21             | A                |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ ; Note 1  | 24N100: 96<br>23N100: 92             | A                |
| $I_{AR}$      | $T_C = 25^\circ\text{C}$   | 24                                   | A                |
| $E_{AR}$      | $T_C = 25^\circ\text{C}$   | 60                                   | mJ               |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$   | 3                                    | J                |
| $dv/dt$       | $I_S \leq I_{DM}$ , $di/dt \leq 100$ A/ $\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 5                                    | V/ns             |
| $P_D$         | $T_C = 25^\circ\text{C}$   | 500                                  | 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 (0.063 in) from case for 10 s   | 300                                  | $^\circ\text{C}$ |
| $V_{ISOL}$    | 50/60 Hz, RMS $t = 1$ min<br>$I_{ISOL} \leq 1$ mA $t = 1$ s  | 2500<br>3000                         | V~<br>V~         |
| $M_d$         | Mounting torque<br>Terminal connection torque  | 1.5/13 Nm/lb.in.<br>1.5/13 Nm/lb.in. |                  |
| <b>Weight</b> |  | 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 ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

## Characteristic Values

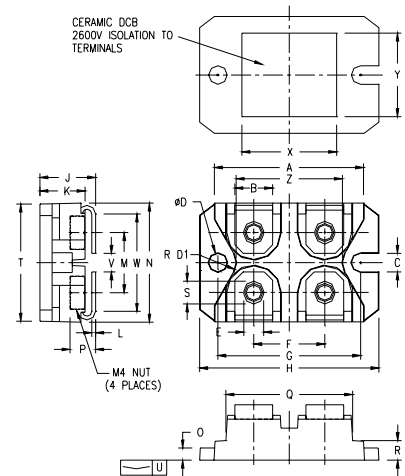
|              |  | Min.  | Typ. | Max.                           |
|--------------|--|---|------|--------------------------------|
| $V_{DSS}$    | $V_{GS} = 0$ V, $I_D = 3$ mA           | 1000  |      | V                              |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8$ mA       | 3.0   |      | 5.0 V                          |
| $I_{GSS}$    | $V_{GS} = \pm 20$ V, $V_{DS} = 0$ V    |   |      | $\pm 200$ nA                   |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0$ V   | $T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$ |      | 100 $\mu\text{A}$<br>2 mA      |
| $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = I_T$<br>Note 2 | 23N100<br>24N100                                      |      | 0.43 $\Omega$<br>0.39 $\Omega$ |

| Symbol   | Test Conditions   | Characteristic Values |      |      |
|--|---|-----------------------|------|------|
|  |   | Min.                  | Typ. | Max. |
| $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ |   |                       |      |      |
| $g_{fs}$   | $V_{DS} = 10\text{ V}; I_D = I_T, \text{ Note 2}$   | 15                    | 22   | S    |
| $C_{iss}$  | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$   |                       | 7000 | pF   |
| $C_{oss}$  |   |                       | 750  | pF   |
| $C_{rss}$  |   |                       | 260  | pF   |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$<br>$R_G = 1\ \Omega \text{ (External)}$ |                       | 35   | ns   |
| $t_r$  |   |                       | 35   | ns   |
| $t_{d(off)}$   |   |                       | 75   | ns   |
| $t_f$  |   |                       | 21   | ns   |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$   |                       | 250  | nC   |
| $Q_{gs}$   |   |                       | 55   | nC   |
| $Q_{gd}$   |   |                       | 135  | nC   |
| $R_{thJC}$   |   |                       | 0.25 | K/W  |
| $R_{thCK}$   |   |                       | 0.07 | K/W  |

**Source-Drain Diode**
 $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ 

| Symbol   | Test Conditions   | Characteristic Values |      |          |               |
|----------|---|-----------------------|------|----------|---------------|
|          |   | Min.                  | Typ. | Max.     |               |
| $I_S$    | $V_{GS} = 0$  | 24N100<br>23N100      |      | 24<br>23 | A<br>A        |
| $I_{SM}$ | Repetitive;<br>pulse width limited by $T_{JM}$  | 24N100<br>23N100      |      | 96<br>92 | A<br>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             |
| $t_{rr}$ | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                                    |                       | 1.0  | 250      | ns            |
| $Q_{RM}$ |   |                       |      |          | $\mu\text{C}$ |
| $I_{RM}$ |   |                       | 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:  
24N100:  $I_T = 12\text{ A}$   
23N100:  $I_T = 11.5\text{ A}$

**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 |

Please see IXFN24N100 data sheet for characteristic curves.

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 | 6,306,728B1 |
| 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 |             |