

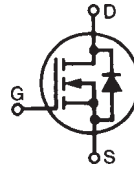
# HiPerFET™ Power MOSFET

## IXFN66N50Q2

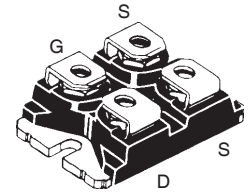
$V_{DSS} = 500 \text{ V}$   
 $I_{D25} = 66 \text{ A}$   
 $R_{DS(on)} = 74 \text{ m}\Omega$   
 $t_{rr} \leq 250 \text{ ns}$

N-Channel Enhancement Mode  
Avalanche Rated, Low  $Q_g$ , Low Intrinsic  $R_g$   
High  $dV/dt$ , Low  $t_{rr}$

Preliminary Data Sheet



miniBLOC, SOT-227 B (IXFN)  
E153432



G = Gate                      D = Drain  
S = Source

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

| 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  | $\pm 30$        | V                |
| $V_{GSM}$     | Transient   | $\pm 40$        | V                |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$  | 66              | A                |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 264             | A                |
| $I_{AR}$      | $T_C = 25^\circ\text{C}$  | 66              | A                |
| $E_{AR}$      | $T_C = 25^\circ\text{C}$  | 75              | mJ               |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$  | 4.0             | J                |
| $dv/dt$       | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 20              | V/ns             |
| $P_D$         | $T_C = 25^\circ\text{C}$  | 735             | W                |
| $T_J$         |   | -55 ... +150    | $^\circ\text{C}$ |
| $T_{JM}$      |   | 150             | $^\circ\text{C}$ |
| $T_{stg}$     |   | -55 ... +150    | $^\circ\text{C}$ |
| $V_{ISOL}$    | 50/60 Hz, RMS, $t = 1$ minute   | 2500            | V                |
| $M_d$         | Mounting torque   | 1.5/13          | Nm/lb.in.        |
|               | Terminal connection torque  | 1.5/13          | Nm/lb.in.        |
| <b>Weight</b> |   | 30              | g                |

### Features

- Double metal process for low gate resistance
- miniBLOC, with Aluminium nitride isolation
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

### Applications

- DC-DC converters
- Switched-mode and resonant-mode power supplies
- DC choppers
- Pulse generators

### Advantages

- 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                        |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$                      | 2.0   |      | 4.5 V                    |
| $I_{GSS}$    | $V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$                    |   |      | $\pm 200 \text{ nA}$     |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0 \text{ V}$                  |   |      | 50 $\mu\text{A}$<br>3 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$<br>Note 1 |   |      | 74 m $\Omega$            |

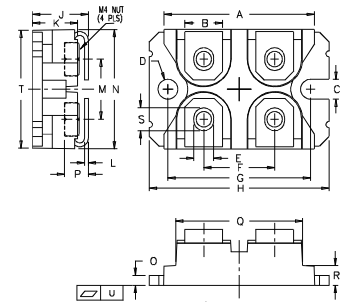
| Symbol                    | Test Conditions   | Characteristic Values                               |      |      |
|---------------------------|---|---|------|------|
|                           |   | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |      |
|                           |   | min.  | typ. | max. |
| <b>g<sub>fs</sub></b>     | V <sub>DS</sub> = 10 V; I <sub>D</sub> = 0.5 • I <sub>D25</sub> Note 1  | 30  | 44   | S    |
| <b>C<sub>iss</sub></b>    | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz  |   | 6800 | pF   |
| <b>C<sub>oss</sub></b>    |   |   | 1200 | pF   |
| <b>C<sub>rss</sub></b>    |   |   | 270  | pF   |
| <b>t<sub>d(on)</sub></b>  | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub><br>R <sub>G</sub> = 1 Ω (External) |   | 32   | ns   |
| <b>t<sub>r</sub></b>      |   |   | 16   | ns   |
| <b>t<sub>d(off)</sub></b> |   |   | 60   | ns   |
| <b>t<sub>f</sub></b>      |   |   | 12   | ns   |
| <b>Q<sub>G(on)</sub></b>  | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub>                                    |   | 199  | nC   |
| <b>Q<sub>GS</sub></b>     |   |   | 42   | nC   |
| <b>Q<sub>GD</sub></b>     |   |   | 92   | nC   |
| <b>R<sub>thJC</sub></b>   |   |   | 0.17 | K/W  |
| <b>R<sub>thCK</sub></b>   |   | 0.05  |      | K/W  |

### Source-Drain Diode

| Symbol                | Test Conditions   | Characteristic Values                               |      |        |
|-----------------------|---|---|------|--------|
|                       |   | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |        |
|                       |   | min.  | typ. | max.   |
| <b>I<sub>S</sub></b>  | V <sub>GS</sub> = 0 V   |   |      | 66 A   |
| <b>I<sub>SM</sub></b> | Repetitive;<br>pulse width limited by T <sub>JM</sub>               |   |      | 264 A  |
| <b>V<sub>SD</sub></b> | I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0 V, Note 1     |   |      | 1.5 V  |
| <b>t<sub>rr</sub></b> | I <sub>F</sub> = 25A<br>-di/dt = 100 A/μs<br>V <sub>R</sub> = 100 V |   |      | 250 ns |
| <b>Q<sub>RM</sub></b> |   |   | 1.0  | μC     |
| <b>I<sub>RM</sub></b> |   |   | 10   | A      |

Note: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %

### miniBLOC, SOT-227 B Outline



M4 screws (4x) supplied

| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | Min.       | Max.  | Min.   | Max.  |
| A    | 31.50      | 31.88 | 1.240  | 1.255 |
| B    | 7.80       | 8.20  | 0.307  | 0.323 |
| C    | 4.09       | 4.29  | 0.161  | 0.169 |
| D    | 4.09       | 4.29  | 0.161  | 0.169 |
| E    | 4.09       | 4.29  | 0.161  | 0.169 |
| F    | 14.91      | 15.11 | 0.587  | 0.595 |
| G    | 30.12      | 30.30 | 1.186  | 1.193 |
| H    | 38.00      | 38.23 | 1.496  | 1.505 |
| J    | 11.68      | 12.22 | 0.460  | 0.481 |
| K    | 8.92       | 9.60  | 0.351  | 0.378 |
| L    | 0.76       | 0.84  | 0.030  | 0.033 |
| M    | 12.60      | 12.85 | 0.496  | 0.506 |
| N    | 25.15      | 25.42 | 0.990  | 1.001 |
| O    | 1.98       | 2.13  | 0.078  | 0.084 |
| P    | 4.95       | 5.97  | 0.195  | 0.235 |
| Q    | 26.54      | 26.90 | 1.045  | 1.059 |
| R    | 3.94       | 4.42  | 0.155  | 0.174 |
| S    | 4.72       | 4.85  | 0.186  | 0.191 |
| T    | 24.59      | 25.07 | 0.968  | 0.987 |
| U    | -0.05      | 0.1   | -0.002 | 0.004 |

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 | 6,259,123B1 | 6,306,728B1 |
| 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 | 6,404,065B1 | 6,162,665   | 6,534,343   |