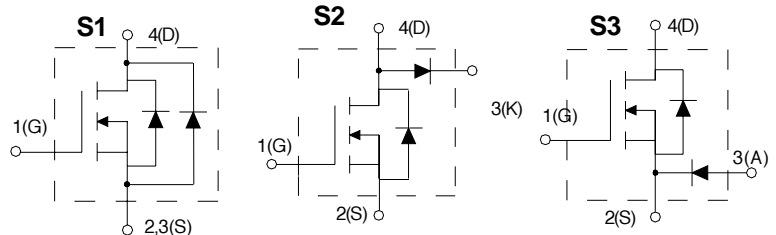


# HiPerFET™ Power MOSFETs with Schottky Diodes

**IXFN 100N10S1**  
**IXFN 100N10S2**  
**IXFN 100N10S3**

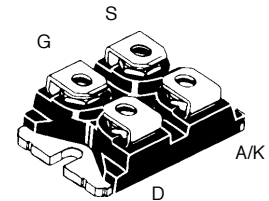
**$V_{DSS} = 100 \text{ V}$**   
 **$I_{D25} = 100 \text{ A}$**   
 **$R_{DS(on)} = 15 \text{ m}\Omega$**

Parallel, Buck & Boost Configurations  
for SMPS, PFC & Motor Control Circuits



|                                 | Symbol                   | Test Conditions  | Maximum Ratings     |                  |           |
|---------------------------------|--------------------------|--|---------------------|------------------|-----------|
| HiPerFET MOSFET                 | $V_{DSS}$                | $T_J = 25^\circ\text{C}$ 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                |           |
|                                 | $I_{D25}$                | $T_C = 25^\circ\text{C}$   | 100                 | A                |           |
|                                 | $I_{DM}$                 | $T_C = 25^\circ\text{C}$ ,<br>pulse width limited by max. $T_{JM}$   | 400                 | A                |           |
|                                 | $I_{AR}$                 | $T_C = 25^\circ\text{C}$   | 100                 | A                |           |
|                                 | $E_{AR}$                 | Repetitive   | 45                  | mJ               |           |
|                                 | $dv/dt$                  | $I_S \leq I_{DM}$ , $-di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 5                   | V/ns             |           |
|                                 | $P_D$                    | $T_C = 25^\circ\text{C}$   | 360                 | W                |           |
| Diode                           | $V_{RRM}$                |  | 100                 | V                |           |
|                                 | $I_{RMS}$                |  | 100                 | A                |           |
|                                 | $I_{FAVM}$               | $T_C = 105^\circ\text{C}$ ; rectangular, $d = 0.5$   | 60                  | A                |           |
|                                 | $I_{FRM}$                | $t_p < 10 \mu\text{s}$ ; pulse width limited by $T_J$  | 700                 | A                |           |
|                                 | $(dv/dt)_{CR}$           |  | 1                   | V/ns             |           |
| $P_D$                           | $T_C = 25^\circ\text{C}$ | 150  | W                   |                  |           |
| Case                            | $T_J$                    |  | -40 ... +150        | $^\circ\text{C}$ |           |
|                                 | $T_{JM}$                 |  | 150                 | $^\circ\text{C}$ |           |
|                                 | $T_{stg}$                |  | -40 ... +150        | $^\circ\text{C}$ |           |
|                                 | $V_{ISOL}$               | 50/60 Hz, RMS  | $t = 1 \text{ min}$ | 2500             | V~        |
|                                 |                          | $I_{ISOL} \leq 1 \text{ mA}$   | $t = 1 \text{ s}$   | 3000             | V~        |
|                                 | $M_d$                    | Mounting torque  |                     | 1.5/13           | Nm/lb.in. |
| Terminal connection torque (M4) |                          |  | 1.5/13              | Nm/lb.in.        |           |
| <b>Weight</b>                   |                          |  | 30                  | g                |           |

**miniBLOC, SOT-227 B**  
**E153432**



S = Source  
G = Gate  
D = Drain  
A = Anode  
K = Cathode

### Features

- Popular Buck & Boost circuit topologies
- Low  $V_F$  Schottky diode with very small switching losses
- International standard package miniBLOC SOT-227B
- Aluminium nitride isolation
  - high power dissipation
- Isolation voltage 3000 V~
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Low drain-to-case capacitance (<60 pF)
  - reduced RFI

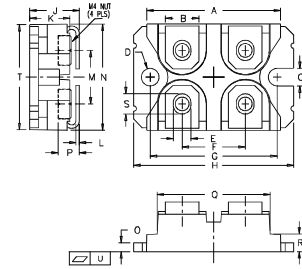
### Applications

- SMPS, power factor controls and buck regulators
- DC servo and robotic drives
- DC choppers
- Switch reluctance motor controls

### Advantages

- Easy to mount with 2 screws
- Space savings
- Tightly coupled Schottky diode

| Symbol       | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ ; unless otherwise specified) |      |                     |
|--------------|---|---|------|---------------------|
|              |   | min.  | typ. | max.                |
| $V_{DS}$     | $V_{GS} = 0\text{ V}; I_D = 3\text{ mA}$                                  | S1  | 100  | V                   |
|              | $V_{GS} = 0\text{ V}; I_D = 250\text{ }\mu\text{A}$                       | S2/S3   | 100  | V                   |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}; I_D = 4\text{ mA}$                                      |   | 2    | 4 V                 |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{ V}_{DC}; V_{DS} = 0$                               |   |      | $\pm 100\text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}$                                   | S1  |      | 2 mA                |
|              |   | S2/S3   |      | 25 $\mu\text{A}$    |
|              | $T_J = 125^\circ\text{C}$   | S1  |      | 20 mA               |
|              |   | S2/S3   |      | 1 mA                |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}; I_D = 0.5 I_{D25}$ ; Note 1                        |   |      | 15 m $\Omega$       |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ ; pulse test                    |   | 30   | 45 S                |
| $C_{iss}$    | $V_{GS} = 0\text{ V}; V_{DS} = 25\text{ V}; f = 1\text{ MHz}$             |   |      | 4500 pF             |
| $C_{oss}$    |   | S1  |      | 1900 pF             |
|              |   | S2/S3   |      | 1600 pF             |
| $C_{rss}$    |   |   |      | 870 pF              |
| $t_{d(on)}$  |   |   |      | 30 ns               |
| $t_r$        | $V_{GS} = 10\text{ V}; V_{DS} = 0.5 V_{DSS}; I_D = 0.5 I_{D25}$           |   |      | 70 ns               |
| $t_{d(off)}$ | $R_G = 1.5\text{ }\Omega$ (External)                                      |   |      | 100 ns              |
| $t_f$        |   |   |      | 30 ns               |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}; V_{DS} = 0.5 V_{DSS}; I_D = 0.5 I_{D25}$           |   |      | 180 nC              |
| $Q_{gs}$     |   |   |      | 36 nC               |
| $Q_{gd}$     |   |   |      | 95 nC               |
| $V_{SD}$     | $I_F = 100\text{ A}; V_{GS} = 0\text{ V}$ ; Note 1 (S2, S3)               |   |      | 1.5 V               |
| $t_{rr}$     | $I_F = 25\text{ A}; -di/dt = 100\text{ A}/\mu\text{s}; V_R = 25\text{ V}$ |   |      | 200 ns              |
| $Q_{RM}$     |   |   |      | 0.8 $\mu\text{C}$   |
| $I_{RM}$     |   |   |      | 6 A                 |
| $R_{thJC}$   |   |   |      | 0.35 K/W            |
| $R_{thCK}$   |   |   |      | 0.05 K/W            |

**miniBLOC, SOT-227 B**


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 |

**Schottky Diode**
**Characteristic Values**

 ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| Symbol     | Test Conditions                                   | Characteristic Values |      |         |
|------------|---|-----------------------|------|---------|
|            |   | min.                  | typ. | max.    |
| $I_R$      | $V_R = V_{RRM}$                                   |                       |      | 2 mA    |
|            | $T_J = 125^\circ\text{C}; V_R = V_{RRM}$          |                       |      | 20 mA   |
| $V_F$      | $I_F = 60\text{ A}; V_{GS} = 0\text{ V}$ ; Note 1 |                       |      | 0.86 V  |
|            | $I_F = 60\text{ A}; V_{GS} = 0\text{ V}$          |                       |      | 0.73 V  |
|            | $I_F = 120\text{ A}$                              |                       |      | 0.93 V  |
| $R_{thJC}$ |   |                       |      | 0.8 K/W |
| $R_{thJK}$ |   |                       |      | 0.1 K/W |

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 |