

# HiPerFET™ Power MOSFETs Single Die MOSFET

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

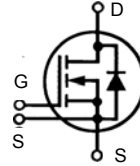
## IXFN 130N30

$$V_{DSS} = 300 \text{ V}$$

$$I_{D25} = 130 \text{ A}$$

$$R_{DS(on)} = 22 \text{ m}\Omega$$

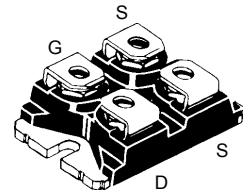
$$t_{rr} \leq 250 \text{ ns}$$



| Symbol        | Test Conditions   | Maximum Ratings |                        |
|---------------|---|-----------------|------------------------|
| $V_{DSS}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$   | 300             | V                      |
| $V_{DGR}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$  | 300             | V                      |
| $V_{GS}$      | Continuous  | $\pm 20$        | V                      |
| $V_{GSM}$     | Transient   | $\pm 30$        | V                      |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$  | 130             | A                      |
| $I_{L(RMS)}$  | Terminal (current limit)  | 100             | A                      |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 520             | A                      |
| $I_{AR}$      | $T_C = 25^\circ\text{C}$  | 100             | A                      |
| $E_{AR}$      | $T_C = 25^\circ\text{C}$  | 85              | mJ                     |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$  | 4               | 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                   |
| $P_D$         | $T_C = 25^\circ\text{C}$  | 700             | 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 $t = 1 \text{ min}$<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          | Nm/lb.in.<br>Nm/lb.in. |
| <b>Weight</b> |   | 30              | g                      |

miniBLOC, SOT-227 B (IXFN)

E153432



G = Gate  
S = Source

D = Drain

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

### Features

- International standard packages
- miniBLOC, with Aluminium nitride isolation
- 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

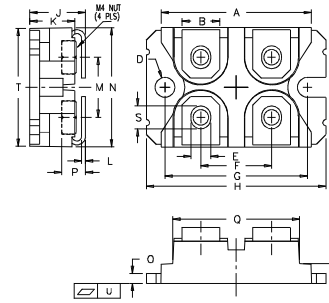
### Advantages

- 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.                      |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$   | 300   |      | V                         |
| $V_{GH(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$  | 2   |      | V                         |
| $I_{GSS}$    | $V_{GS} = \pm 20 V_{DC}$ , $V_{DS} = 0$   |   |      | $\pm 200 \text{ nA}$      |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $T_J = 25^\circ\text{C}$<br>$V_{GS} = 0 \text{ V}$ , $T_J = 125^\circ\text{C}$                       |   |      | 100 $\mu\text{A}$<br>2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ ,<br>duty cycle $d \leq 2 \%$ |   |      | 22 m $\Omega$             |

| Symbol       | Test Conditions  | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |       |      |
|--------------|--|---|-------|------|
|              |  | min.  | typ.  | max. |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 60\text{ A}$ , pulse test   | 70  | 92    | S    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$  |   | 14500 | pF   |
| $C_{oss}$    |  |   | 2650  | pF   |
| $C_{rss}$    |  |   | 610   | pF   |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$<br>$R_G = 1\ \Omega$ (External), |   | 45    | ns   |
| $t_r$        |  |   | 75    | ns   |
| $t_{d(off)}$ |  |   | 130   | ns   |
| $t_f$        |  |   | 31    | ns   |
| $Q_{G(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$                                  |   | 380   | nC   |
| $Q_{GS}$     |  |   | 95    | nC   |
| $Q_{GD}$     |  |   | 180   | nC   |
| $R_{thJC}$   |  |   | 0.18  | 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 |

| Symbol   | Test Conditions  | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|----------|--|---|------|---------------|
|          |  | min.  | typ. | max.          |
| $I_s$    | $V_{GS} = 0\text{ V}$  |   |      | 130 A         |
| $I_{SM}$ | Repetitive;<br>pulse width limited by $T_{JM}$   |   |      | 520 A         |
| $V_{SD}$ | $I_F = 100\text{ A}, V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |   |      | 1.5 V         |
| $t_{rr}$ | $I_F = 30\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                                     |   |      | 250 ns        |
| $Q_{RM}$ |  |   | 0.8  | $\mu\text{C}$ |
| $I_{RM}$ |  |   | 8    | A             |

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

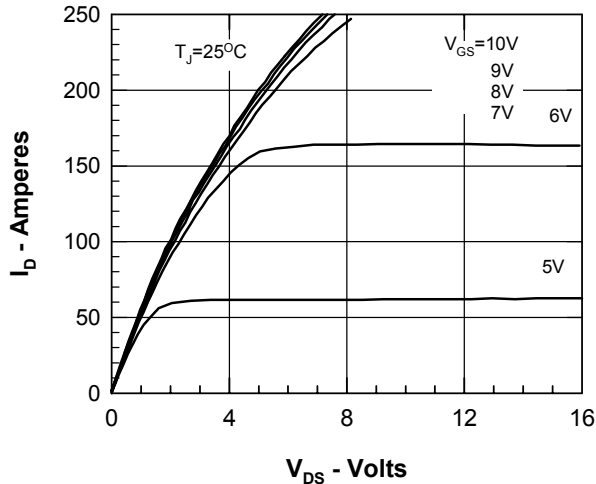


Figure 1. Output Characteristics at 25°C

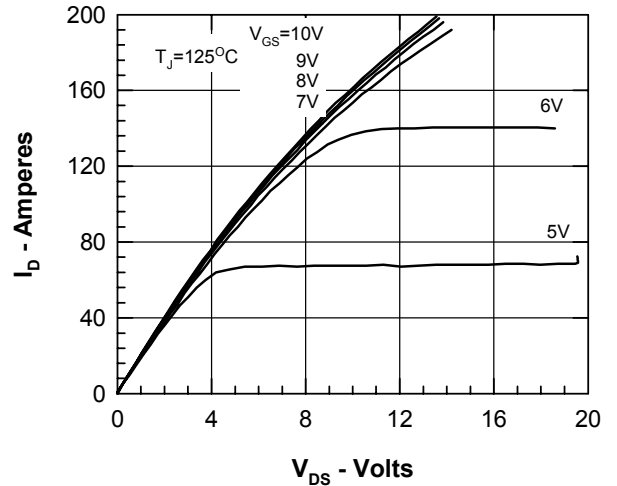


Figure 2. Output Characteristics at 125°C

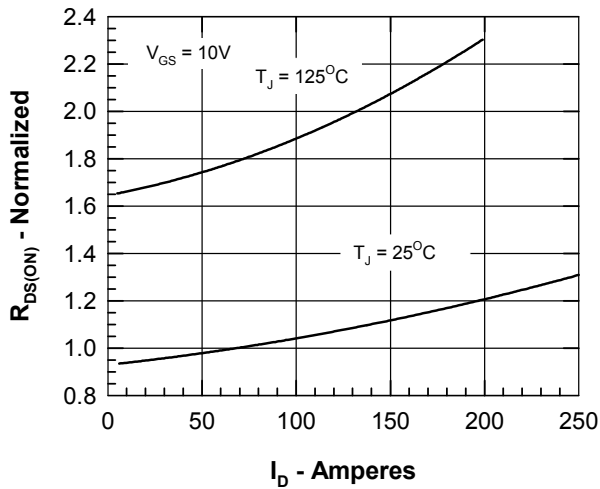
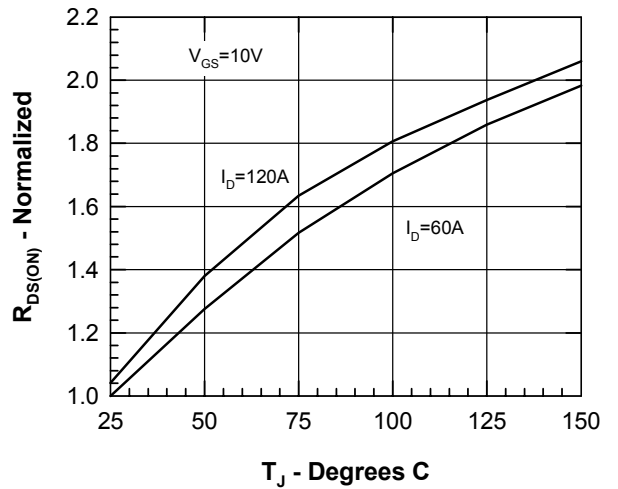
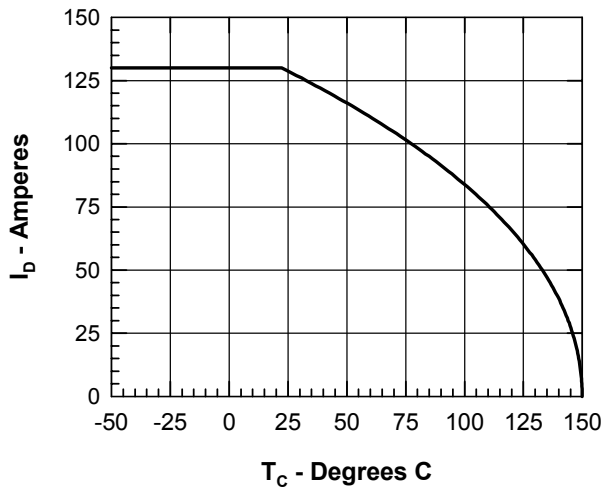

 Figure 3.  $R_{DS(on)}$  normalized to  $0.5 I_{D25}$  value vs.  $I_D$ 

 Figure 4.  $R_{DS(on)}$  normalized to  $0.5 I_{D25}$  value vs.  $T_J$ 


Figure 5. Drain Current vs. Case Temperature

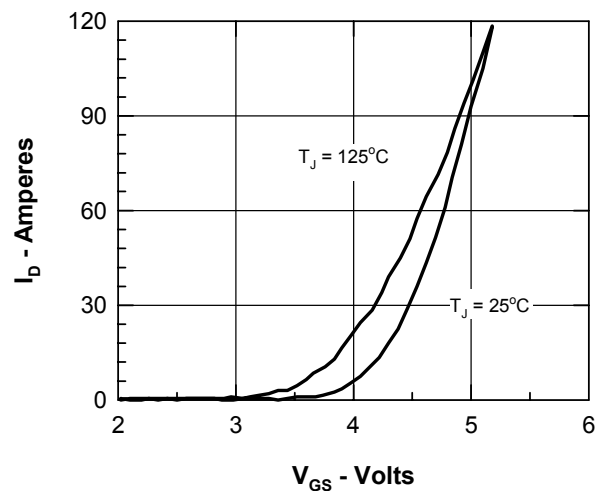


Figure 6. Admittance Curves

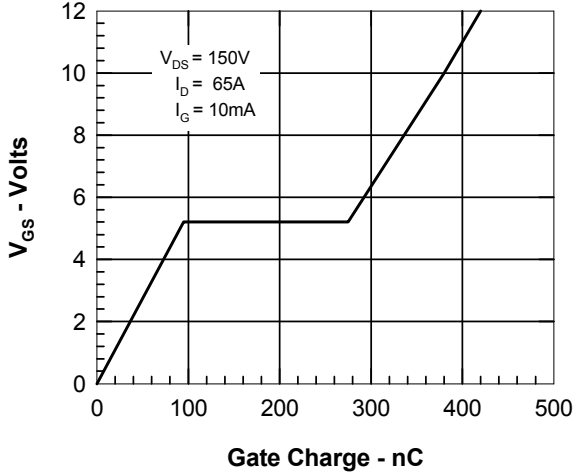


Figure 7. Gate Charge

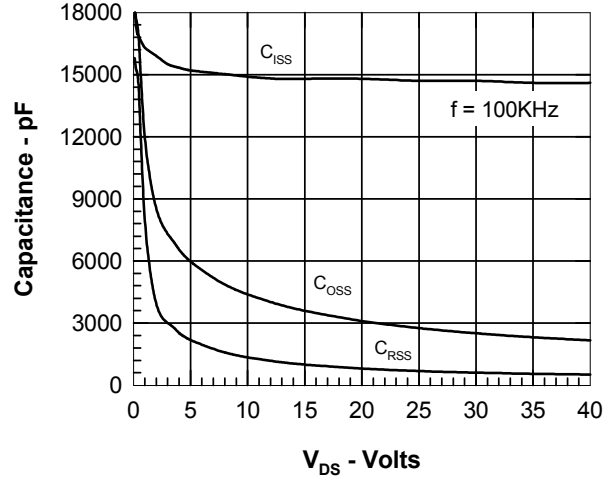


Figure 8. Capacitance Curves

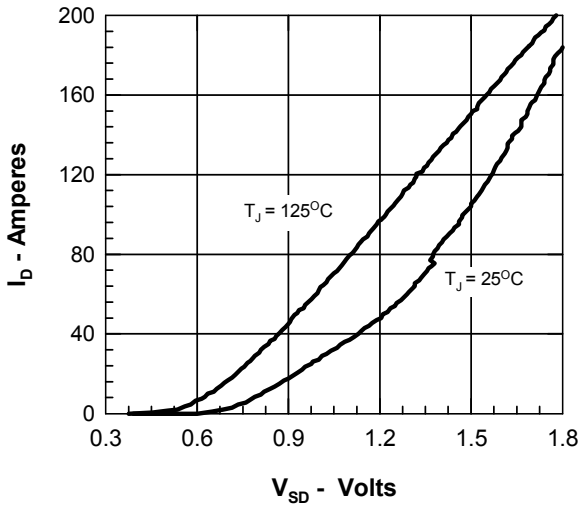


Figure 9. Forward Voltage Drop of the Intrinsic Diode

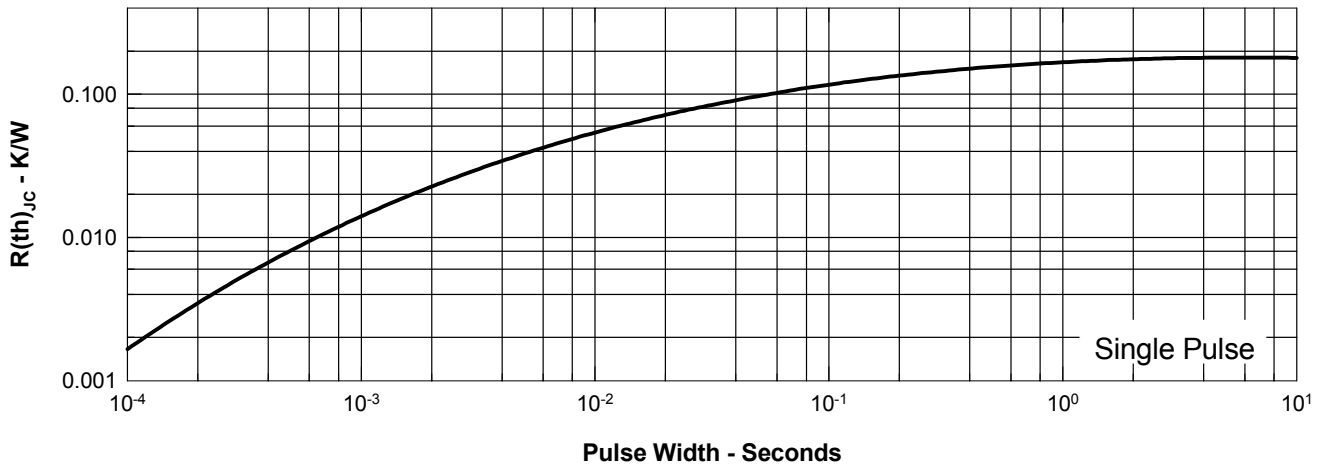


Figure 10. Transient Thermal Resistance

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 |             |



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