

HiPerFET™ Power MOSFET

IXFN 180N10

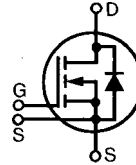
$$V_{DSS} = 100 \text{ V}$$

$$I_{D25} = 180 \text{ A}$$

$$R_{DS(on)} = 8 \text{ m}\Omega$$

Single MOSFET Die

Preliminary data sheet



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

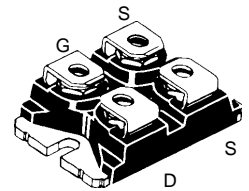
Symbol Test Conditions

Maximum Ratings

| | | | |
|---------------|---|--------------|------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 100 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C , $R_{GS} = 1\text{M}\Omega$ | 100 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 180 | A |
| $I_{L(RMS)}$ | Terminal (current limit) | 100 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$; Note 1 | 720 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 180 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 60 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 3 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$ | 5 | V/ns |
| P_D | $T_C = 25^\circ\text{C}$ | 600 | 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 $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$ | 2500 3000 | V~ V~ |
| M_d | Mounting torque | 1.5/13 | Nm/lb.in. |
| | Terminal connection torque | 1.5/13 | Nm/lb.in. |
| Weight | | 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 package
- Encapsulating epoxy meets UL 94 V-0, flammability classification
- 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
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

Advantages

- 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} | $V_{GS} = 0 \text{ V}$, $I_D = 3 \text{ mA}$ | 100 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8 \text{ mA}$ | 2 | | V |
| I_{GSS} | $V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$ | | | ± 100 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0 \text{ V}$ | | | 100 μA 2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Note 2 | | | 8 m Ω |

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|-----------------------|------|------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 60\text{ A}$, Note 2 | 60 | 90 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 9100 | pF |
| C_{oss} | | | 3200 | pF |
| C_{rss} | | | 1600 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External), | | 50 | ns |
| t_r | | | 90 | ns |
| $t_{d(off)}$ | | | 140 | ns |
| t_f | | | 65 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 360 | nC |
| Q_{gs} | | | 65 | nC |
| Q_{gd} | | | 190 | nC |
| R_{thJC} | LOC, SOT-227 B | | 0.21 | K/W |
| R_{thCK} | miniBLOC, SOT-227 B | 0.05 | | K/W |

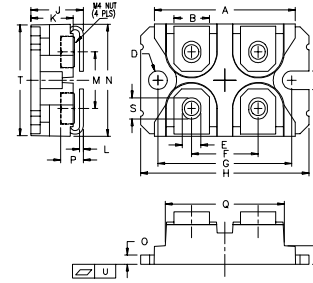
Source-Drain Diode

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

| Symbol | Test Conditions | Characteristic Values | | |
|----------|--|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0$ | | | 180 A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | | 720 A |
| V_{SD} | $I_F = 100\text{ A}, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 1.5 V |
| t_{rr} | $I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 50\text{ V}$ | | 1.1 | 250 ns |
| Q_{RM} | | | 13 | μC |
| I_{RM} | | | | A |

- Notes:
- Pulse width limited by T_{JM} .
 - Pulse test, $t \leq 300\text{ ms}$, duty cycle $d \leq 2\%$

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 |

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

Figure 1. Output Characteristics at 25°C

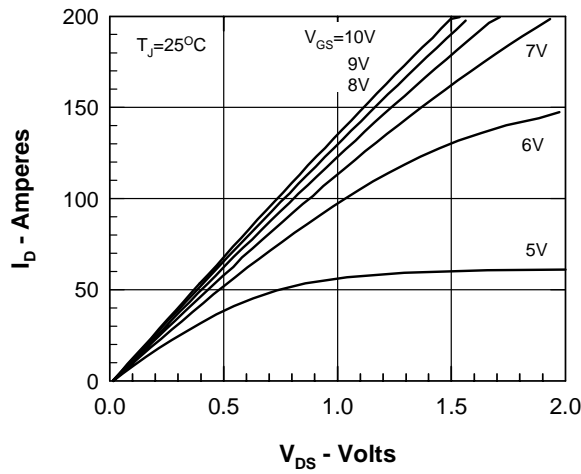


Figure 2. Output Characteristics at 125°C

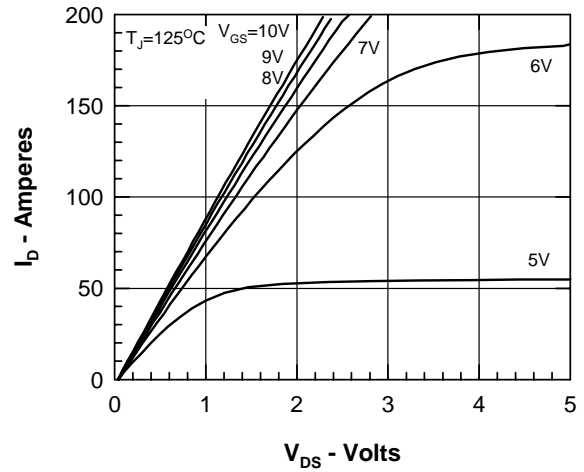


Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

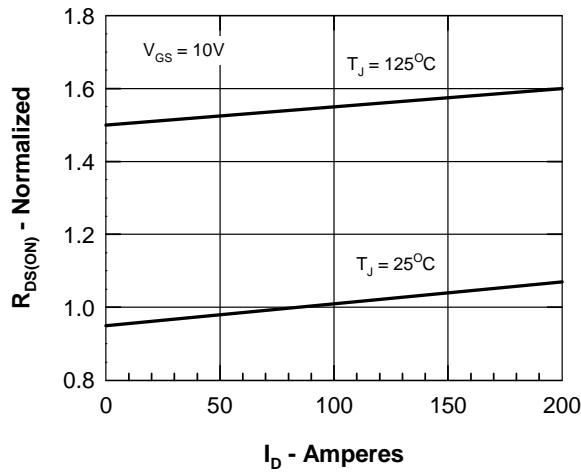


Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

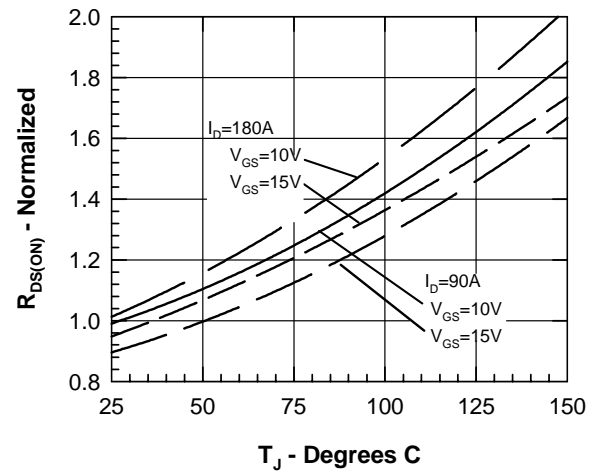


Figure 5. Drain Current vs. Case Temperature

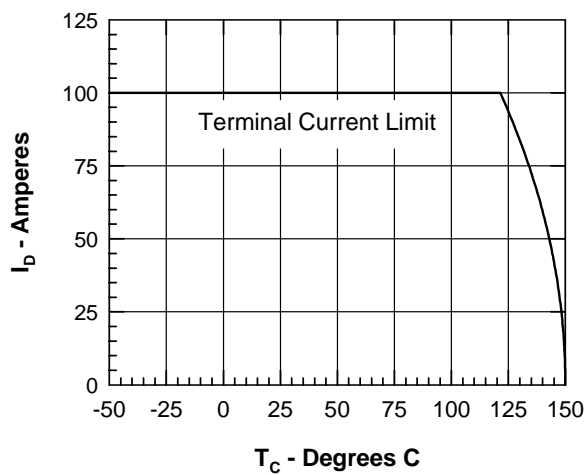


Figure 6. Admittance Curves

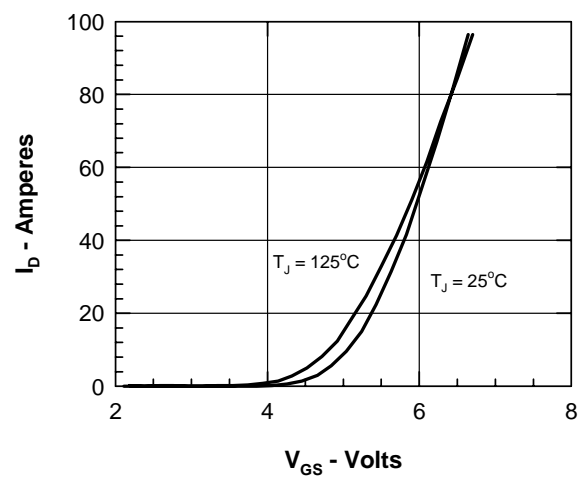


Figure 7. Gate Charge

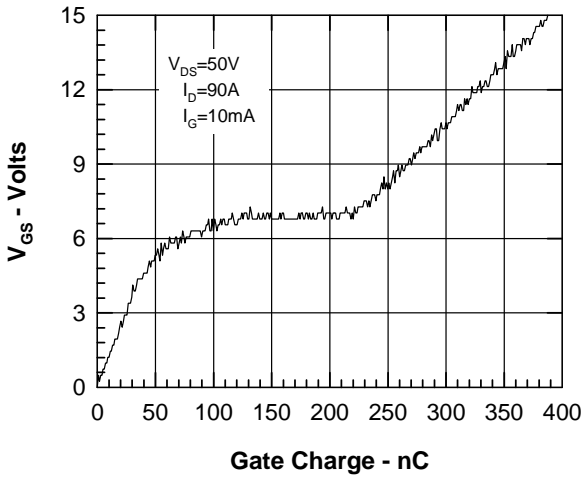


Figure 8. Capacitance Curves

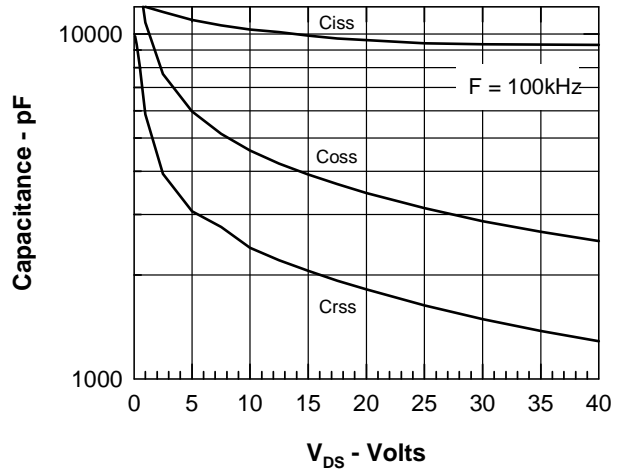


Figure 9. Forward Voltage Drop of the Intrinsic Diode

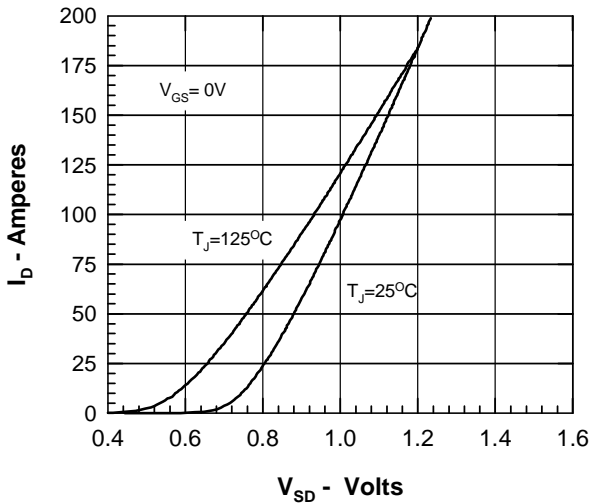


Figure 10. Forward Bias Safe Operating Area

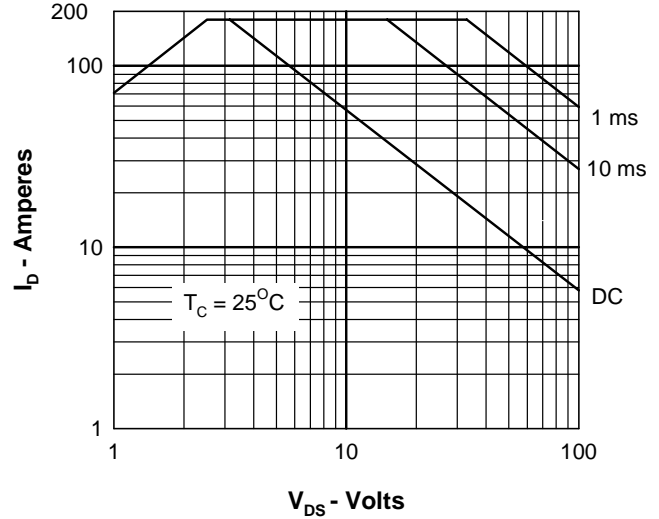


Figure 11. Transient Thermal Resistance

