

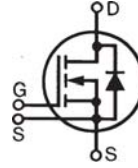
HiPerFET™ Power MOSFET

Single MOSFET Die

IXFN 24N100
IXFN 23N100

| V_{DSS} | I_{D25} | $R_{DS(on)}$ |
|-----------|-----------|---------------|
| 1000 V | 24 A | 0.39 Ω |
| 1000 V | 23 A | 0.43 Ω |

$t_{rr} \leq 250$ ns



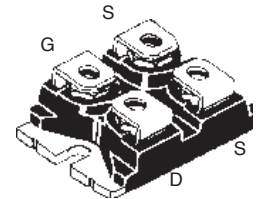
Symbol Test Conditions

Maximum Ratings

| | | | |
|---------------|--|--------------------------------------|--------------------|
| V_{DSS} | $T_J = 25^{\circ}\text{C}$ to 150°C | 1000 | V |
| V_{DGR} | $T_J = 25^{\circ}\text{C}$ to 150°C , $R_{GS} = 1\text{M}\Omega$ | 1000 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^{\circ}\text{C}$ | 24N100: 24 23N100: 23 | A |
| I_{DM} | $T_C = 25^{\circ}\text{C}$; Note 1 | 24N100: 96 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/ μs , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^{\circ}\text{C}$, $R_G = 2$ Ω | 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 $t = 1$ min $I_{ISOL} \leq 1$ mA $t = 1$ s | 2500 3000 | V~ V~ |
| M_d | Mounting torque Terminal connection torque | 1.5/13 Nm/lb.in. 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} | $V_{GS} = 0$ V, $I_D = 3$ mA | 1000 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8$ mA | 3.0 | | 5.5 V |
| I_{GSS} | $V_{GS} = \pm 20$ V, $V_{DS} = 0$ V | | | ± 100 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0$ V | $T_J = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$ | | 100 μA 2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = 0.5 I_{D25}$ Note 2 | 23N100 24N100 | | 0.43 Ω 0.39 Ω |

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|-----------------------|------|------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 \ddot{I}_{D25}$, 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 |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \ddot{I}_{V_{DSS}}, I_D = 0.5 \ddot{I}_{D25}$ $R_G = 1\ \Omega$ (External), | | 35 | ns |
| t_r | | | 35 | ns |
| $t_{d(off)}$ | | | 75 | ns |
| t_f | | | 21 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \ddot{I}_{V_{DSS}}, I_D = 0.5 \ddot{I}_{D25}$ | | 250 | nC |
| Q_{gs} | | | 55 | nC |
| Q_{gd} | | | 135 | nC |
| R_{thJC} | | | 0.21 | K/W |
| R_{thCK} | | 0.05 | | K/W |

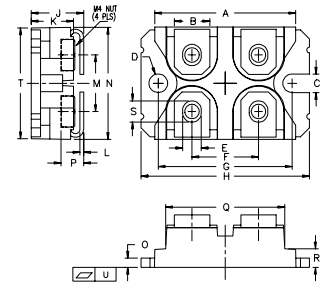
Source-Drain Diode

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

| Symbol | Test Conditions | Characteristic Values | | | |
|----------|---|-----------------------|------|----------|---------------|
| | | Min. | Typ. | Max. | |
| I_S | $V_{GS} = 0$ | 24N100 23N100 | | 24 23 | A A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | 24N100 23N100 | | 96 92 | A A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 1.5 | V |
| t_{rr} | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | 1.0 | 250 | ns |
| Q_{RM} | | | 8 | | μC |
| I_{RM} | | | | | A |

- Notes: 1. Pulse width limited by T_{JM} .
2. 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 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 |
| | 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 |
| | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | 6,771,478 B2 |

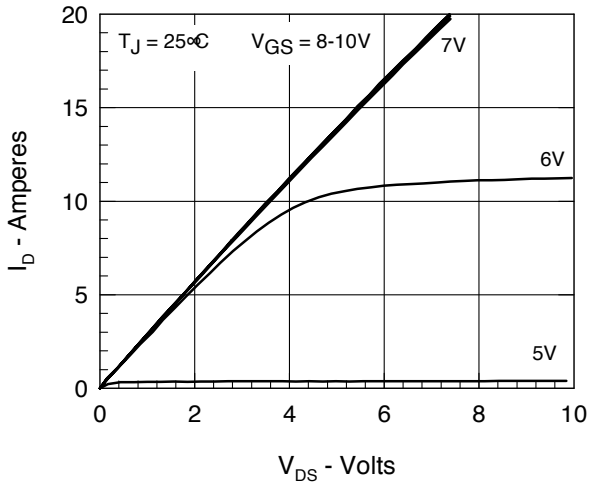


Figure 1. Output Characteristics at 25°C

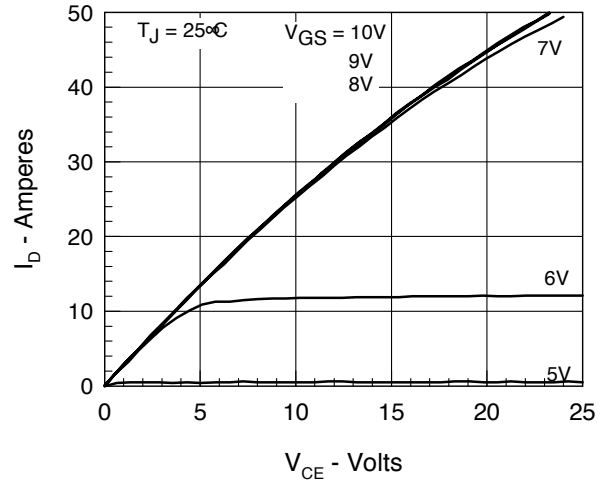


Figure 2. Extended Output Characteristics at 125°C

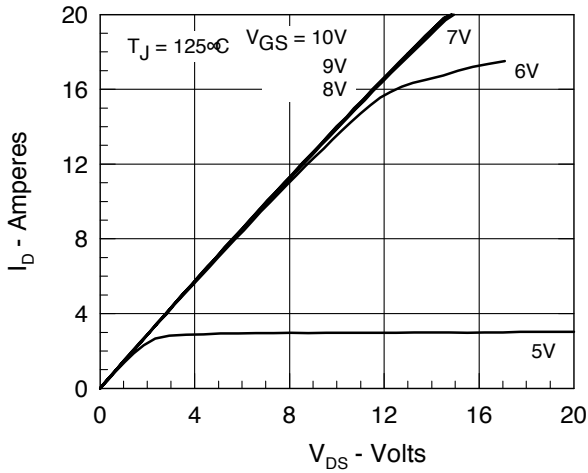


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

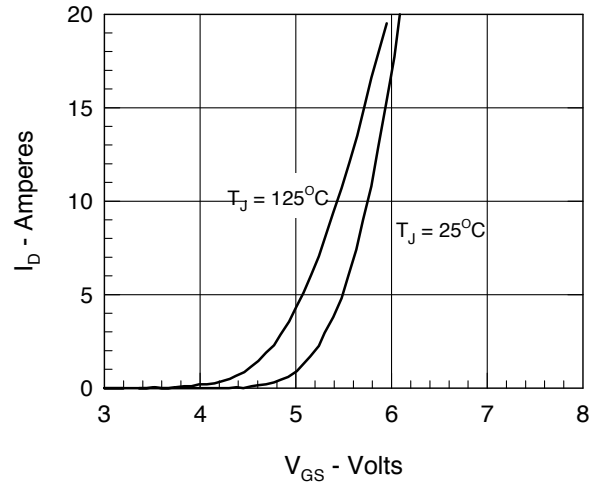


Figure 4. Admittance Curves

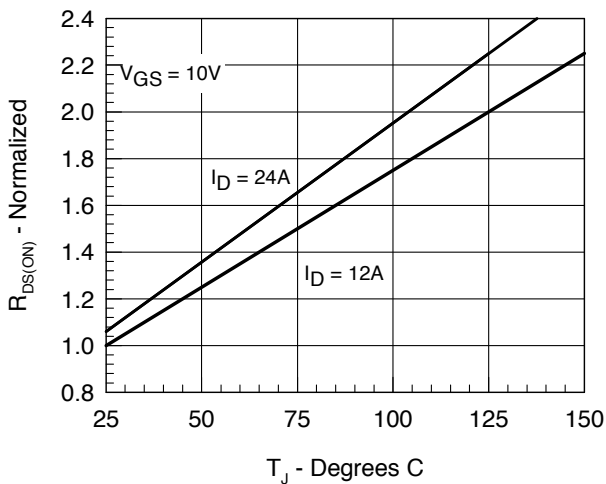


Figure 5. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

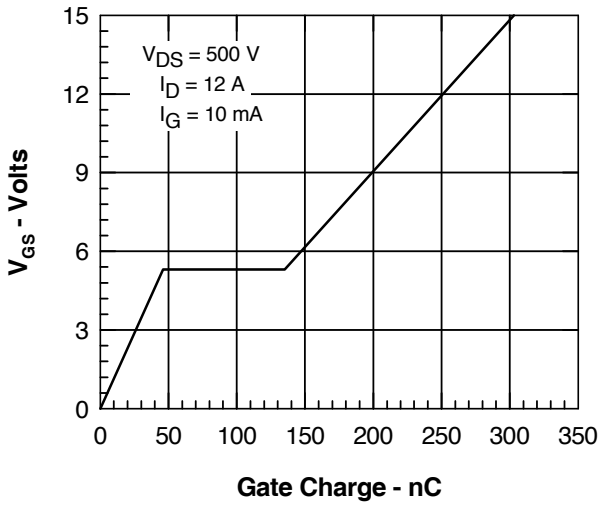


Figure 6. Gate Charge

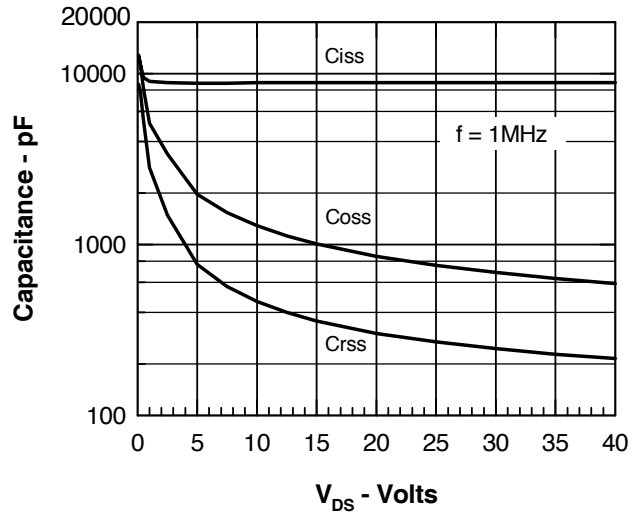


Figure 7. Capacitance Curves

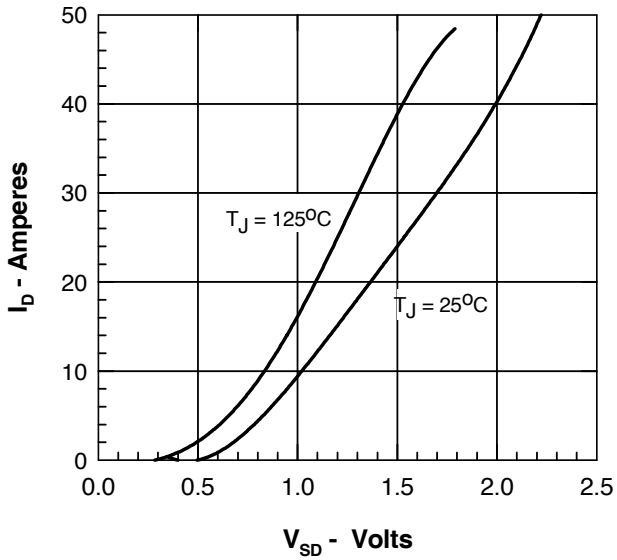


Figure 8. Forward Voltage Drop of the Intrinsic Diode

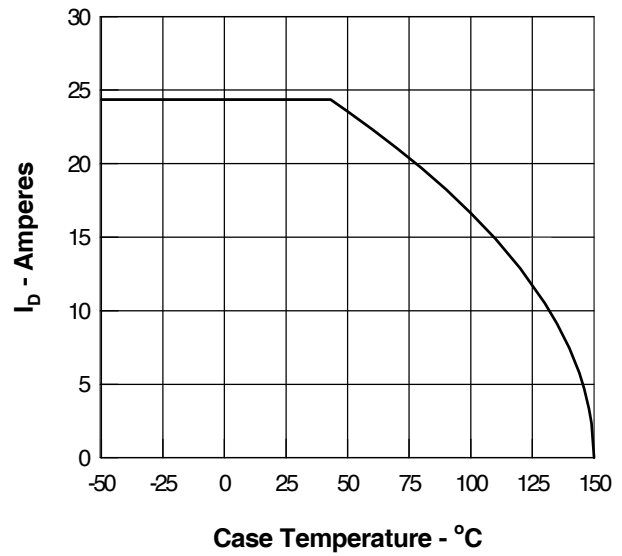


Figure 9. Drain Current vs. Case Temperature

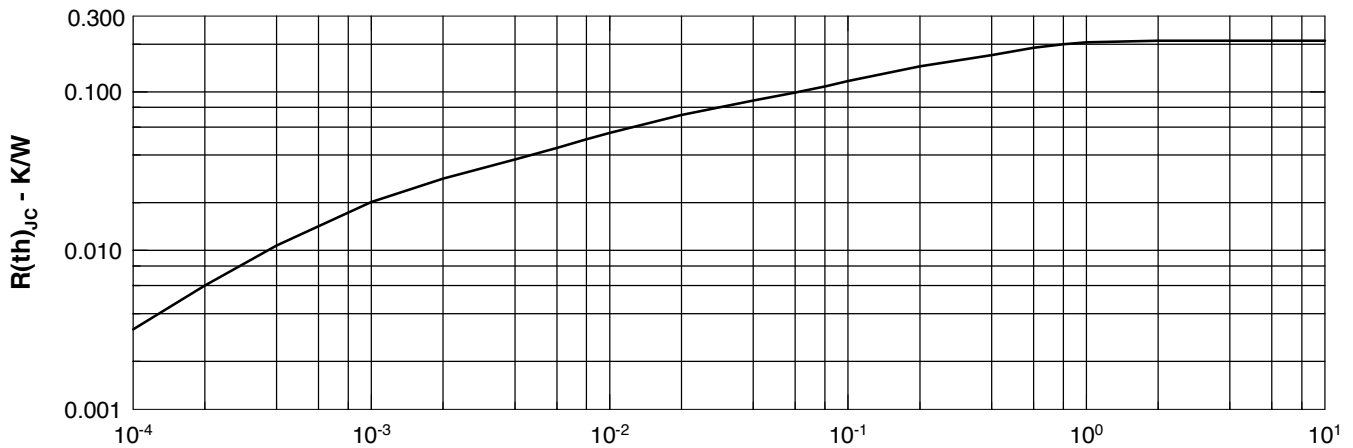


Figure 10. Transient Thermal Resistance