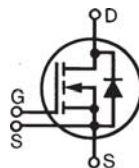


Polar™ HiPerFET™ Power MOSFET

IXFN300N10P

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



$$V_{DSS} = 100V$$

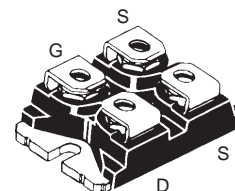
$$I_{D25} = 295A$$

$$R_{DS(on)} \leq 5.5m\Omega$$

$$t_{rr} \leq 200ns$$

| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|------------------------|--------------------------|
| V_{DSS} | $T_J = 25^\circ C$ to $175^\circ C$ | 100 | V |
| V_{DGR} | $T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$ | 100 | V |
| V_{GSS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ C$ | 295 | A |
| I_{LRMS} | External Lead Current Limit | 200 | A |
| I_{DM} | $T_C = 25^\circ C$, Pulse Width Limited by T_{JM} | 900 | A |
| I_A | $T_C = 25^\circ C$ | 100 | A |
| E_{AS} | $T_C = 25^\circ C$ | 3 | J |
| dv/dt | $I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 175^\circ C$ | 20 | V/ns |
| P_D | $T_C = 25^\circ C$ | 1070 | W |
| T_J | | -55 ... +175 | $^\circ C$ |
| T_{JM} | | 175 | $^\circ C$ |
| T_{stg} | | -55 ... +175 | $^\circ C$ |
| T_L | 1.6mm (0.062 in.) from Case for 10s | 300 | $^\circ C$ |
| V_{ISOL} | 50/60 Hz, RMS $I_{ISOL} \leq 1mA$ | $t = 1min$ $t = 1s$ | 2500 3000 V~ V~ |
| M_d | Mounting Torque Terminal Connection Torque | 1.5/13 1.3/11.5 | Nm/lb.in Nm/lb.in |
| Weight | | 30 | g |

miniBLOC
E153432



G = Gate
S = Source
D = Drain

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

Features

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- Low $R_{DS(on)}$ and Q_G
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC and DC Motor Drives
- Uninterrupted Power Supplies
- High Speed Power Switching Applications

| Symbol | Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|----------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0V$, $I_D = 3mA$ | 100 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8mA$ | 2.5 | | V |
| I_{GSS} | $V_{GS} = \pm 20V$, $V_{DS} = 0V$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 150^\circ C$ | | | 25 μA 1.5 mA |
| $R_{DS(on)}$ | $V_{GS} = 10V$, $I_D = 50A$, Note 1 | | | 5.5 m Ω |

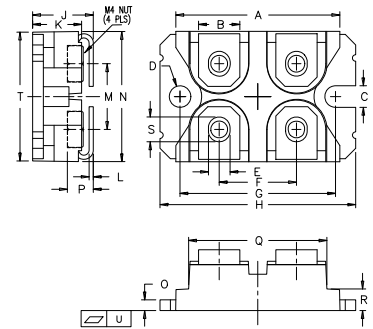
| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 10V, I_D = 60A$, Note 1 | 55 | 92 | S |
| C_{iss} | $V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$ | | 23 | nF |
| C_{oss} | | | 6100 | pF |
| C_{rss} | | | 417 | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 100A$ $R_G = 1\Omega$ (External) | | 36 | ns |
| t_r | | | 35 | ns |
| $t_{d(off)}$ | | | 56 | ns |
| t_f | | | 25 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 150A$ | | 279 | nC |
| Q_{gs} | | | 84 | nC |
| Q_{gd} | | | 107 | nC |
| R_{thJC} | | | 0.14 | $^{\circ}C/W$ |
| R_{thCS} | | 0.05 | | $^{\circ}C/W$ |

Source-Drain Diode

| Symbol | Test Conditions | Characteristic Values | | |
|----------|--|-----------------------|------|---------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0V$ | | | 300 A |
| I_{SM} | Repetitive, Pulse Width Limited by T_{JM} | | | 1000 A |
| V_{SD} | $I_F = 100A, V_{GS} = 0V$, Note 1 | | | 1.3 V |
| t_{rr} | $I_F = 150A, -di/dt = 100A/\mu s$ $V_R = 50V$ | | 0.71 | 200 ns |
| Q_{RM} | | | | μC |
| I_{RM} | | | 10 | A |

Note 1: Pulse test, $t \leq 300\mu s$, duty cycle, $d \leq 2\%$.

SOT-227B Outline (IXFN)



| SYM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.240 | 1.255 | 31.50 | 31.88 |
| B | .307 | .323 | 7.80 | 8.20 |
| C | .161 | .169 | 4.09 | 4.29 |
| D | .161 | .169 | 4.09 | 4.29 |
| E | .161 | .169 | 4.09 | 4.29 |
| F | .587 | .595 | 14.91 | 15.11 |
| G | 1.186 | 1.193 | 30.12 | 30.30 |
| H | 1.496 | 1.505 | 38.00 | 38.23 |
| J | .460 | .481 | 11.68 | 12.22 |
| K | .351 | .378 | 8.92 | 9.60 |
| L | .030 | .033 | 0.76 | 0.84 |
| M | .496 | .506 | 12.60 | 12.85 |
| N | .990 | 1.001 | 25.15 | 25.42 |
| O | .078 | .084 | 1.98 | 2.13 |
| P | .195 | .235 | 4.95 | 5.97 |
| Q | 1.045 | 1.059 | 26.54 | 26.90 |
| R | .155 | .174 | 3.94 | 4.42 |
| S | .186 | .191 | 4.72 | 4.85 |
| T | .968 | .987 | 24.59 | 25.07 |
| U | -.002 | .004 | -0.05 | 0.1 |

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 | 7,005,734 B2 | 7,157,338B2 |
| 4,860,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 7,063,975 B2 | |
| 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 | 7,071,537 | |

Fig. 1. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

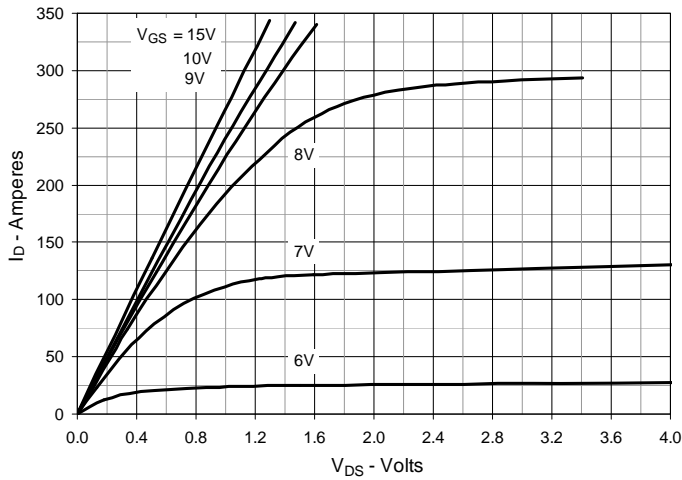


Fig. 2. Output Characteristics @ $T_J = 150^\circ\text{C}$

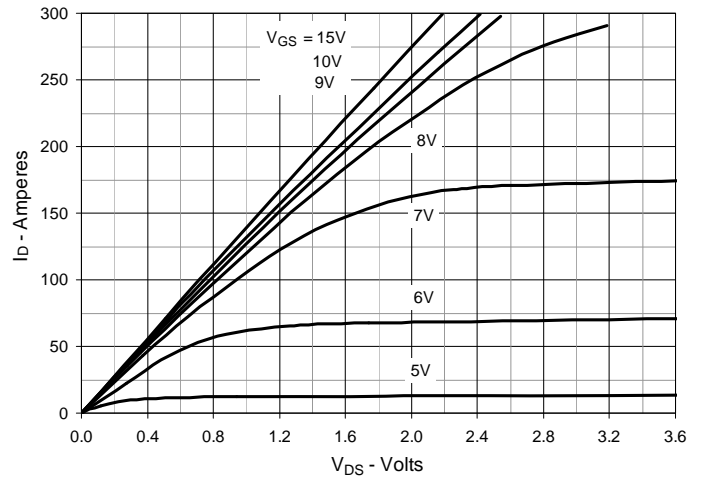


Fig. 3. $R_{DS(on)}$ Normalized to $I_D = 150\text{A}$ Value vs. Junction Temperature

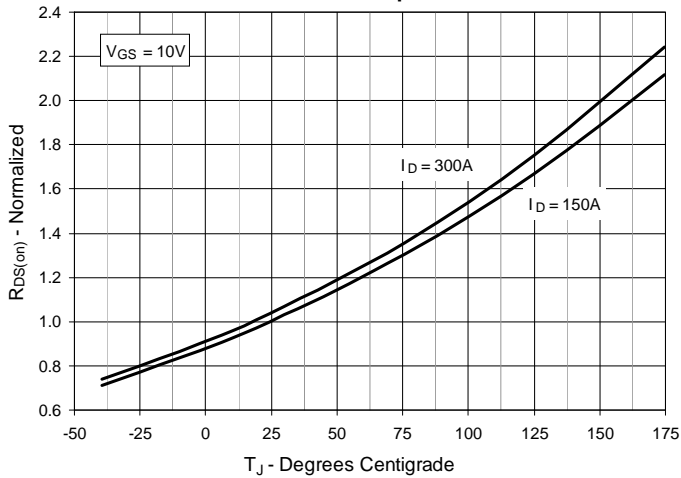


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 150\text{A}$ Value vs. Drain Current

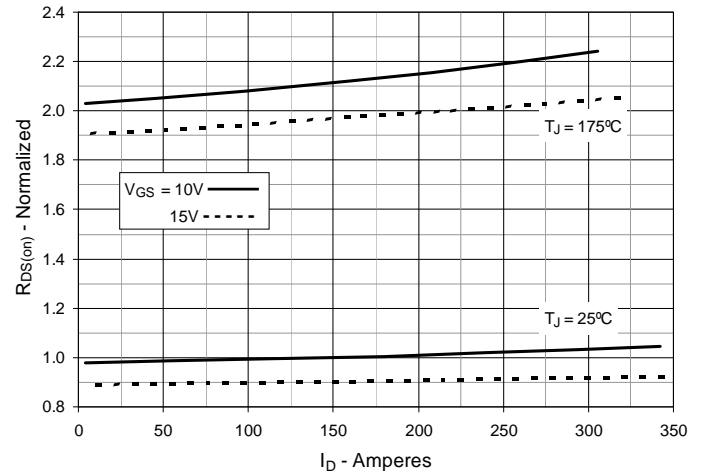


Fig. 5. Maximum Drain Current vs. Case Temperature

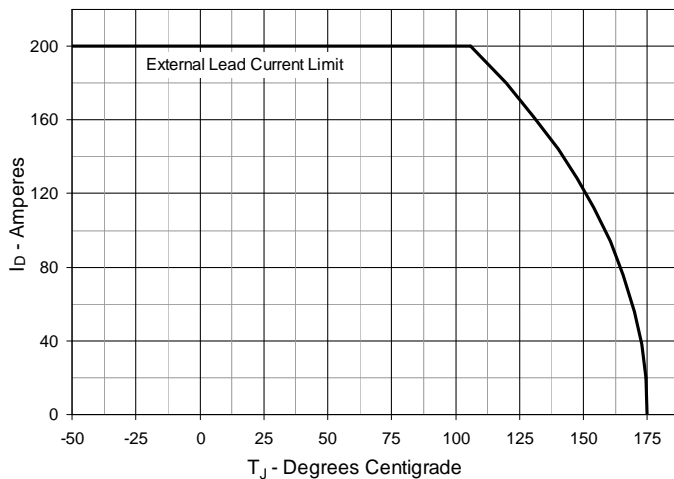


Fig. 6. Input Admittance

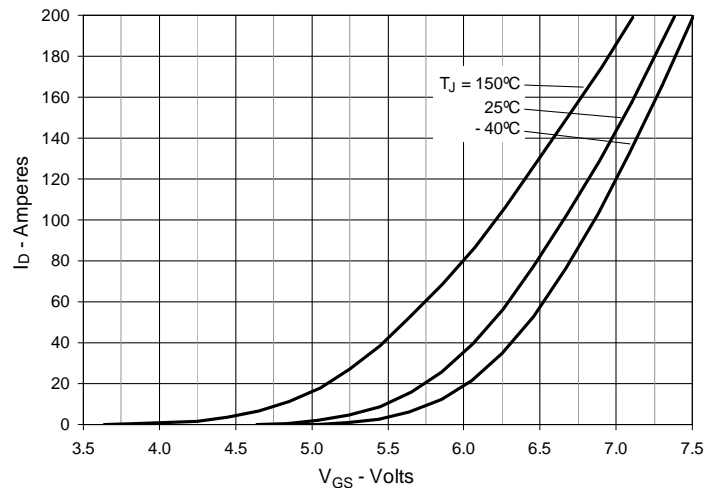


Fig. . Transconductance

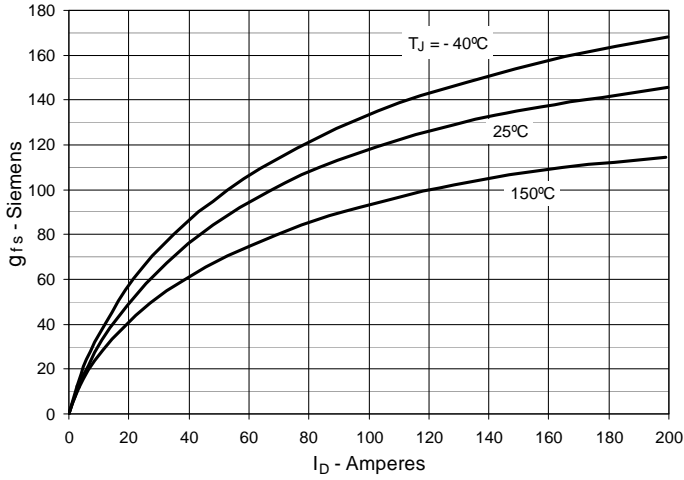


Fig. 8. Forward Voltage Drop of Intrinsic Diode

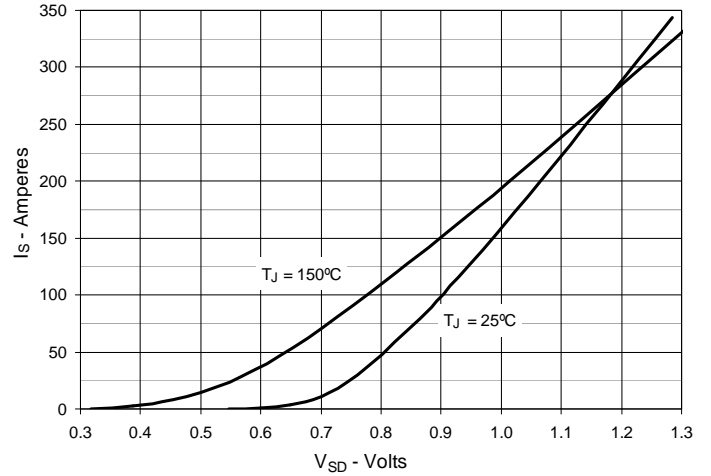


Fig. 9. Gate Charge

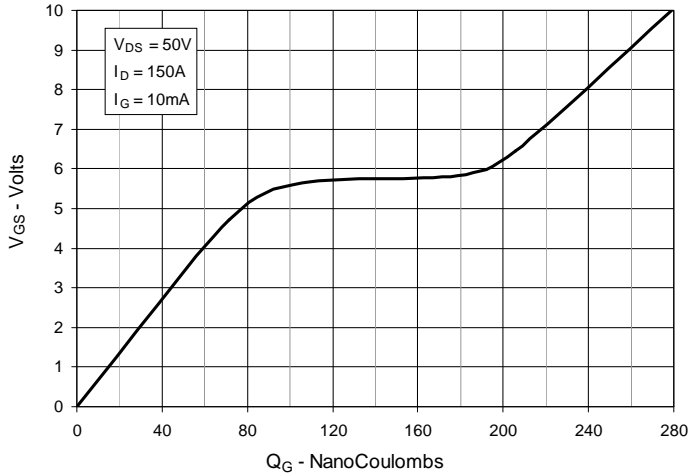


Fig. 10. Capacitance

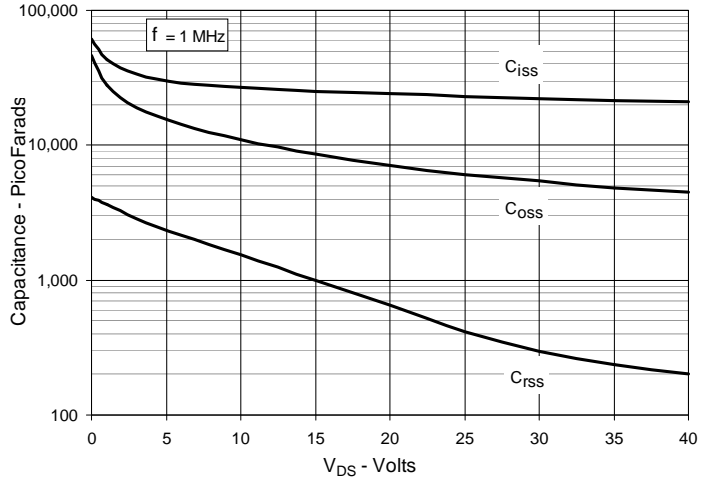


Fig. 11. Forward-Bias Safe Operating Area

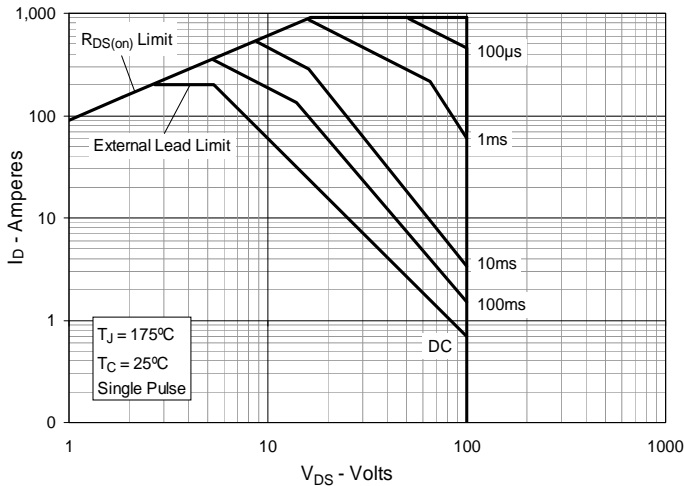
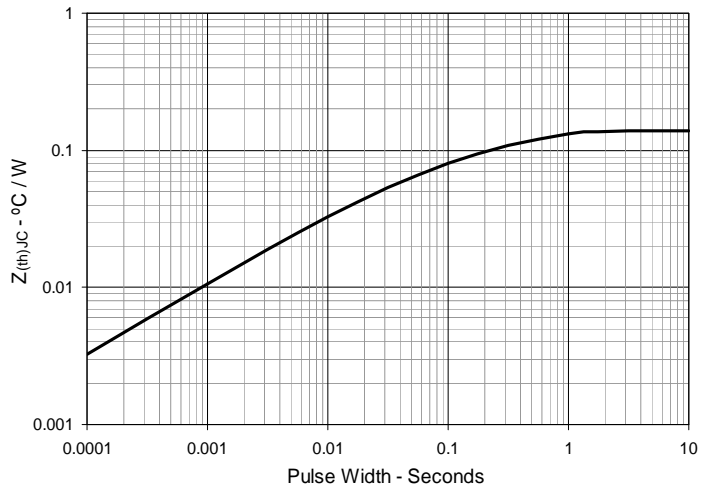


Fig. 12. Maximum Transient Thermal Impedance





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