

Polar™ HiPerFET™
Power MOSFET

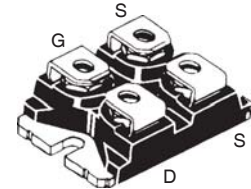
IXFN26N120P

V_{DSS} = 1200V
I_{D25} = 23A
R_{DS(on)} ≤ 500mΩ
t_{rr} ≤ 300ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



miniBLOC
 E153432



G = Gate D = Drain
S = Source

Either Source Terminal S can be used as the Source Terminal or the Kelvin Source (Gate Return) Terminal.

| Symbol | Test Conditions | Maximum Ratings | |
|-------------------|--|-----------------|-----------|
| V _{DSS} | T _J = 25°C to 150°C | 1200 | V |
| V _{DGR} | T _J = 25°C to 150°C, R _{GS} = 1MΩ | 1200 | V |
| V _{GSS} | Continuous | ± 30 | V |
| V _{GSM} | Transient | ± 40 | V |
| I _{D25} | T _C = 25°C | 23 | A |
| I _{DM} | T _C = 25°C, Pulse Width Limited by T _{JM} | 60 | A |
| I _A | T _C = 25°C | 13 | A |
| E _{AS} | T _C = 25°C | 1.5 | J |
| P _D | T _C = 25°C | 695 | W |
| dv/dt | I _S ≤ I _{DM} , V _{DD} ≤ V _{DSS} , T _J ≤ 150°C | 20 | V/ns |
| T _J | | -55 ... +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 ... +150 | °C |
| V _{ISOL} | 50/60 Hz, RMS, t = 1minute | 2500 | V~ |
| | I _{ISOL} ≤ 1mA, t = 1s | 3000 | V~ |
| M _d | Mounting Torque for Base Plate | 1.5/13 | Nm/lb.in. |
| | Terminal Connection Torque | 1.3/11.5 | Nm/lb.in. |
| Weight | | 30 | g |

Features

- International Standard Package
- Low Intrinsic Gate Resistance
- miniBLOC with Aluminum Nitride Isolation
- Fast Intrinsic Diode
- Dynamic dv/dt Rating
- Avalanche Rated
- Low R_{DS(ON)} and Q_G
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

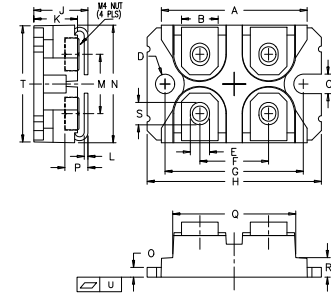
Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Discharger Circuits in Lesers Pulsers, Spark Igniters, RF Generators
- High Voltage Pulse Power Supplies
- AC and DC Motor Drives
- High Speed Power Switching Application

| Symbol | Test Conditions (T _J = 25°C Unless Otherwise Specified) | Characteristic Values | | |
|---------------------|---|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| BV _{DSS} | V _{GS} = 0V, I _D = 3mA | 1200 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 1mA | 3.5 | | 6.5 V |
| I _{GSS} | V _{GS} = ± 30V, V _{DS} = 0V | | | ± 200 nA |
| I _{DSS} | V _{DS} = V _{DSS} , V _{GS} = 0V T _J = 125°C | | | 50 μA 5 mA |
| R _{DS(on)} | V _{GS} = 10V, I _D = 13A, Note 1 | | | 500 mΩ |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 20\text{V}, I_D = 13\text{A}$, Note 1 | 13 | 21 | S |
| C_{iss} | $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$ | | 14 | nF |
| C_{oss} | | | 725 | pF |
| C_{rss} | | | 50 | pF |
| R_{Gi} | Gate Input Resistance | | 1.5 | Ω |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 13\text{A}$ $R_G = 1\Omega$ (External) | | 56 | ns |
| t_r | | | 55 | ns |
| $t_{d(off)}$ | | | 76 | ns |
| t_f | | | 58 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 13\text{A}$ | | 255 | nC |
| Q_{gs} | | | 87 | nC |
| Q_{gd} | | | 98 | nC |
| R_{thJC} | | | | 0.18°C/W |
| R_{thCS} | | 0.05 | | $^\circ\text{C/W}$ |

SOT-227B (IXFN) Outline



(M4 screws (4x) supplied)

| 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 |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|----------|---|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0\text{V}$ | | | 26 A |
| I_{SM} | Repetitive, Pulse Width Limited by T_{JM} | | | 104 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{V}$, Note 1 | | | 1.5 V |
| t_{rr} | $I_F = 13\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$ | | | 300 ns |
| Q_{RM} | | | 1.3 | μC |
| I_{RM} | | | 12.0 | A |

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

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 |
| | 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 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 | |

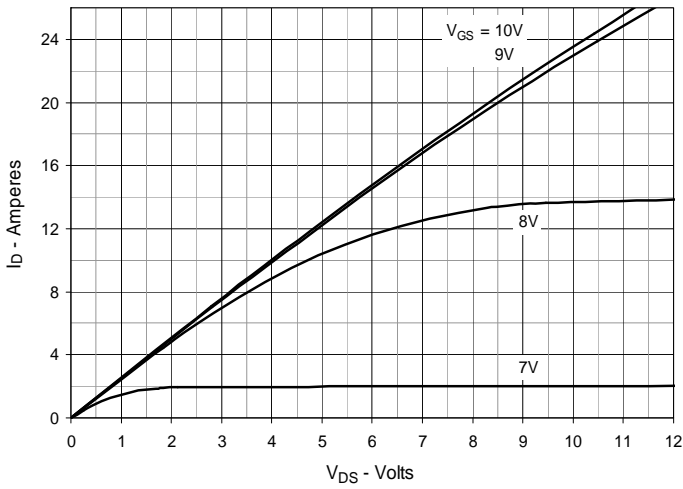
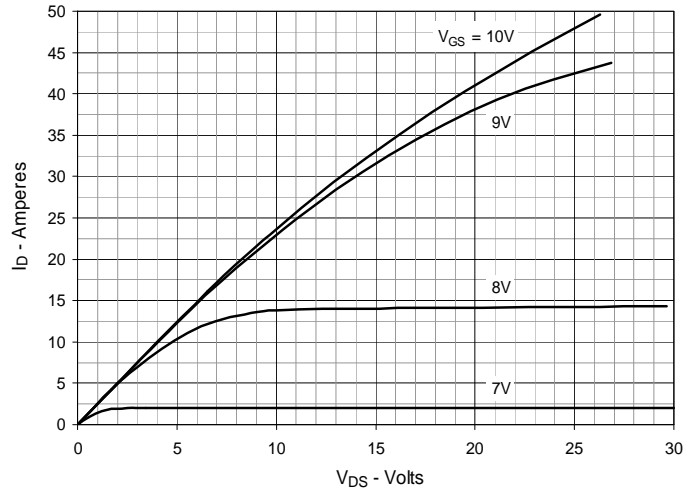
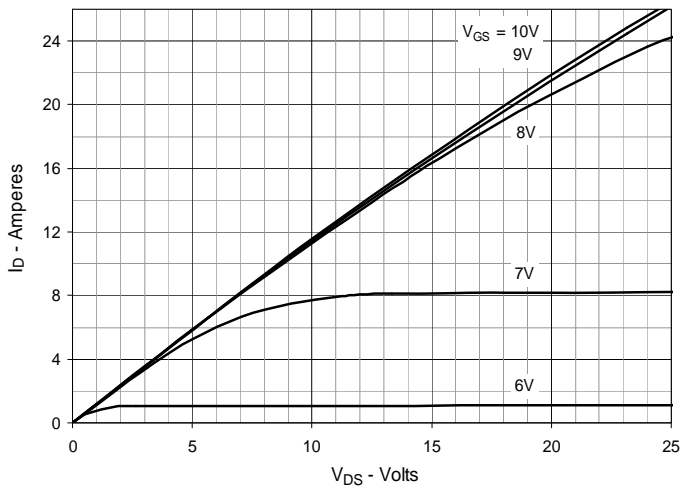
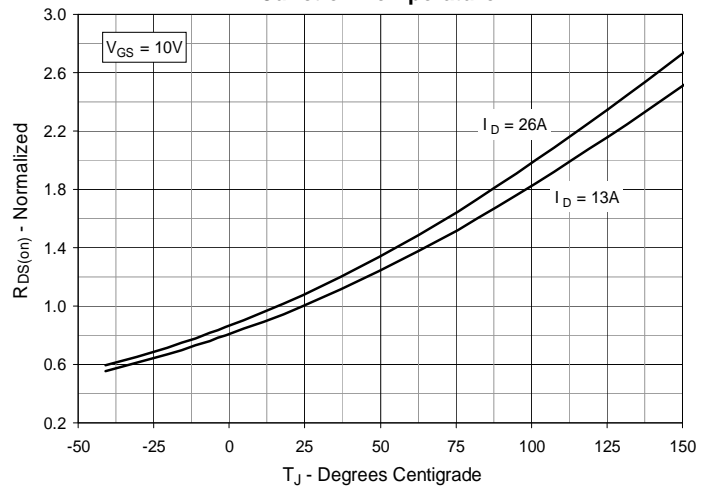
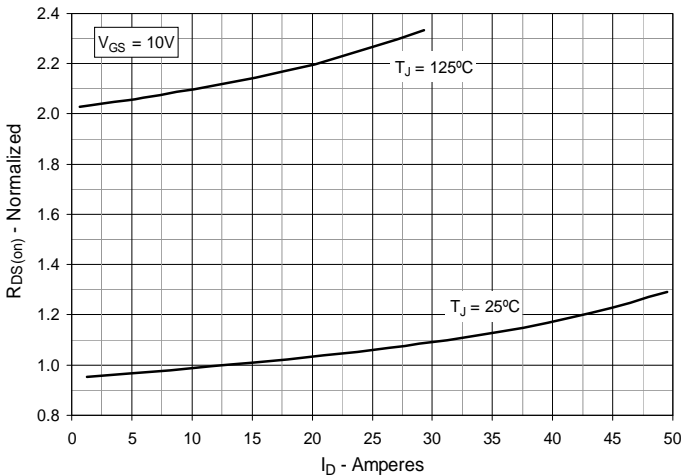
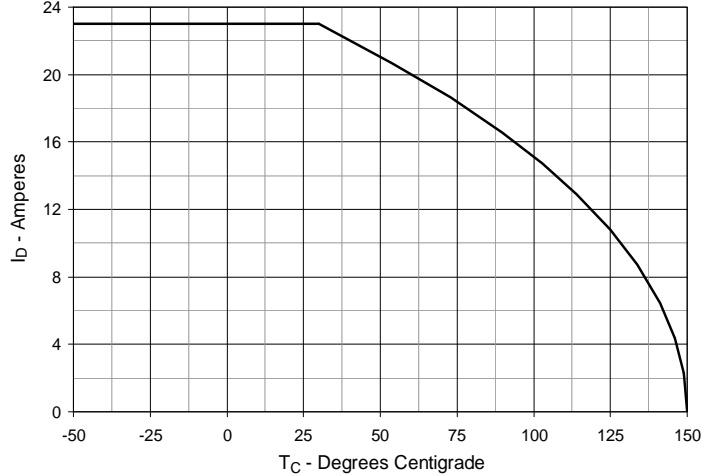
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 13\text{A}$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 13\text{A}$ Value vs. Drain Current

Fig. 6. Maximum Drain Current vs. Case Temperature


Fig. 7. Input Admittance

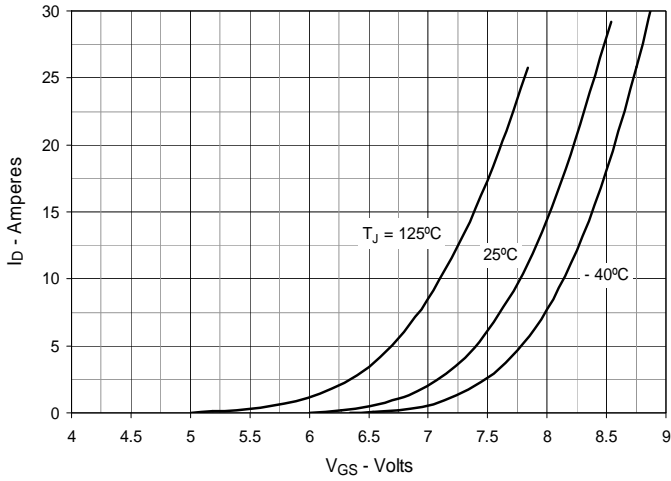


Fig. 8. Transconductance

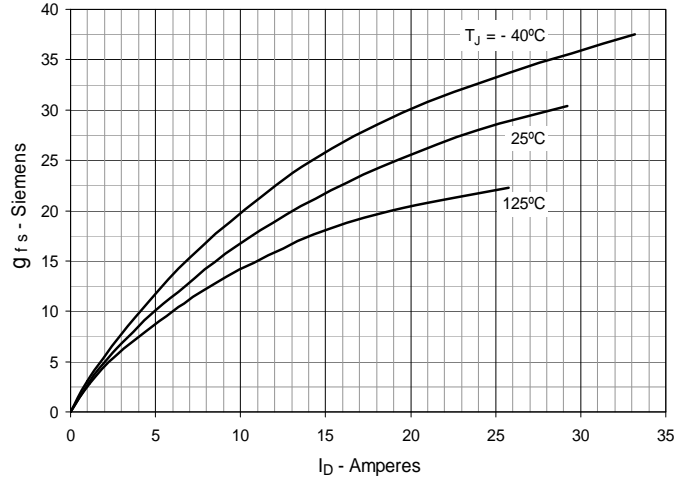


Fig. 9. Forward Voltage Drop of Intrinsic Diode

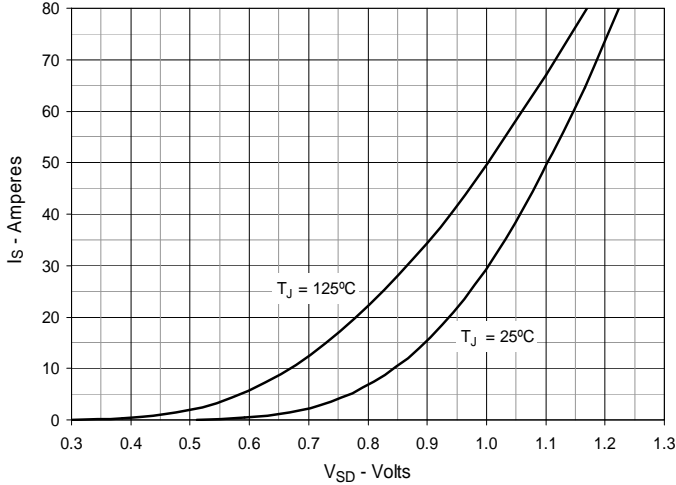


Fig. 10. Gate Charge

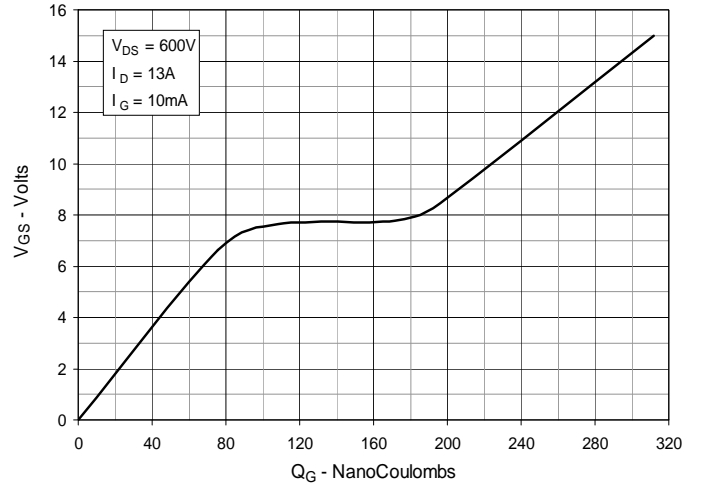


Fig. 11. Capacitance

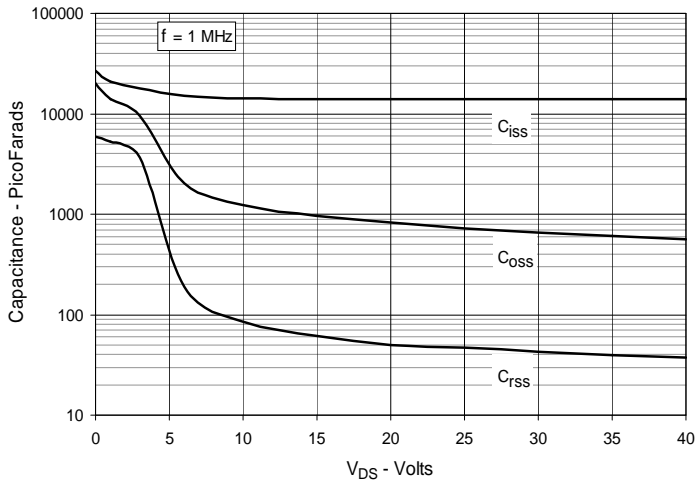
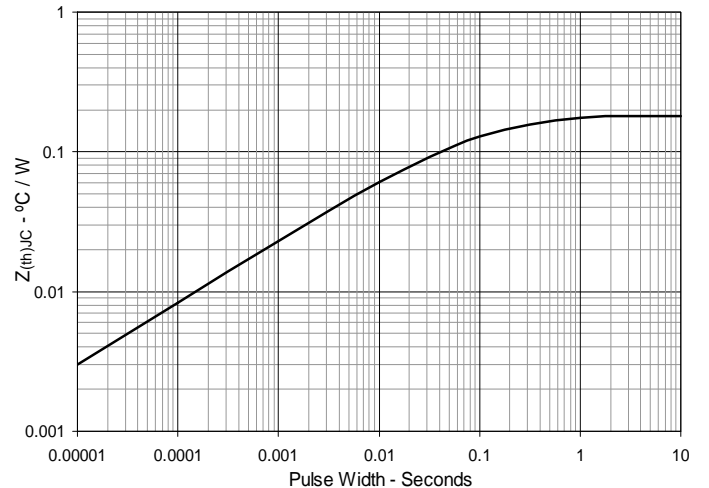


Fig. 12. Maximum Transient Thermal Impedance



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