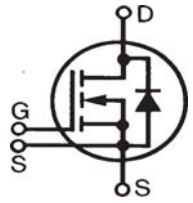
# IXYS

## Linear™ Power MOSFET w/ Extended FBSOA

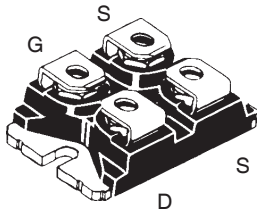
# IXTN22N100L

$V_{DSS}$ = 1000V
$I_{D25}$ = 22A
$R_{DS(on)}$ ≤ 600mΩ

N-Channel Enhancement Mode
Avalanche Rated




**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 | 1000 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C, $R_{GS}$ = 1MΩ | 1000 | V |
| $V_{GSS}$ | Continuous | ±30 | V |
| $V_{GSM}$ | Transient | ±40 | V |
| $I_{D25}$ | $T_C$ = 25°C | 22 | A |
| $I_{DM}$ | $T_C$ = 25°C, Pulse Width Limited by $T_{JM}$ | 50 | A |
| $I_A$ | $T_C$ = 25°C | 22 | A |
| $E_{AS}$ | $T_C$ = 25°C | 1.5 | J |
| $P_D$ | $T_C$ = 25°C | 700 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| $T_L$ | 1.6mm (0.062 in.) from Case for 10s | 300 | °C |
| $T_{SOLD}$ | Plastic Body for 10s | 260 | °C |
| $V_{ISOL}$ | 50/60 Hz, RMS t = 1 Minute | 2500 | V~ |
| | $I_{ISOL}$ ≤ 1mA t = 1 Second | 3000 | V~ |
| $M_d$ | Mounting Torque | 1.5/13 | Nm/lb.in. |
| | Terminal Connection Torque | 1.3/11.5 | Nm/lb.in. |
| **Weight** | | 30 | g |

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ = 1mA | 1000 | | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 250μA | 3.0 | | 5.5 | V |
| $I_{GSS}$ | $V_{GS}$ = ±30V, $V_{DS}$ = 0V | | | ±200 | nA |
| $I_{DSS}$ | $V_{DS} = V_{DSS}$, $V_{GS}$ = 0V | | | 50 | μA |
| | $T_J$ = 125°C | | | 1 | mA |
| $R_{DS(on)}$ | $V_{GS}$ = 20V, $I_D = 0.5 \bullet I_{DSS}$, Note 1 | | | 600 | mΩ |

### Features

- MiniBLOC with Aluminium Nitride Isolation
- Designed for Linear Operation
- International Standard Package
- Avalanche Rated
- Molding Epoxy Meets UL94 V-0 Flammability Classification

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- Programmable Loads
- Current Regulators
- DC-DC Converters
- Battery Chargers
- DC Choppers
- Temperature and Lighting Controls

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 20V, $I_D$ = 0.5 • $I_{DSS}$, Note 1 | 4.5 | 7.0 | 9.5 | S |
| $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 7050 | | pF |
| $C_{oss}$ | | | 600 | | pF |
| $C_{rss}$ | | | 100 | | pF |
| $t_{d(on)}$ | **Resistive Switching Times** | | 36 | | ns |
| $t_r$ | $V_{GS}$ = 15V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 • $I_{DSS}$ | | 35 | | ns |
| $t_{d(off)}$ | $R_G$ = 2Ω (External) | | 80 | | ns |
| $t_f$ | | | 50 | | ns |
| $Q_{g(on)}$ | $V_{GS}$= 15V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 • $I_{DSS}$ | | 270 | | nC |
| $Q_{gs}$ | | | 70 | | nC |
| $Q_{gd}$ | | | 110 | | nC |
| $R_{thJC}$ | | | | 0.18 | °C/W |
| $R_{thCS}$ | | | 0.05 | | °C/W |

**Safe-Operating-Area Specification**

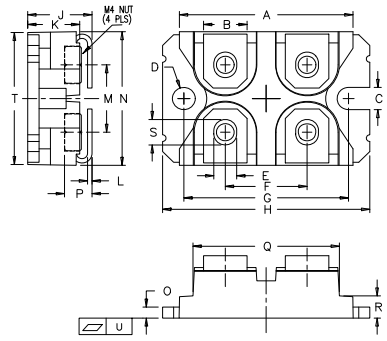
| Symbol | Test Conditions | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| **SOA** | $V_{DS}$ = 800V, $I_D$ = 0.3A, $T_C$ = 90°C , tp = 5s | 240 | | | W |

**Source-Drain Diode**

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0V | | | 22 | A |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$ | | | 50 | A |
| $V_{SD}$ | $I_F$ = $I_S$, $V_{GS}$ = 0V, Note 1 | | | 1.5 | V |
| $t_{rr}$ | $I_F$ = $I_S$, -di/dt = 100A/μs $V_R$ = 100V, $V_{GS}$ = 0V | | 1000 | | ns |

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

**SOT-227B (IXTN) Outline**




(M4 screws (4x) supplied)

| SYM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS 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 |

**Fig. 1. Output Characteristics @ $T_J$ = 25ºC**

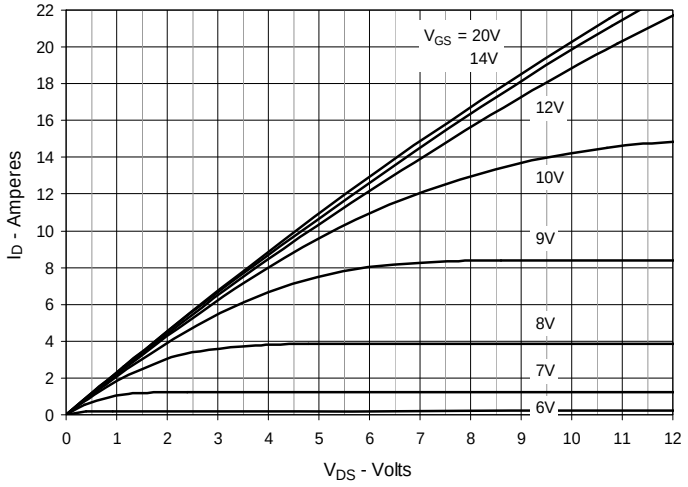



**Fig. 2. Extended Output Characteristics @ $T_J$ = 25ºC**

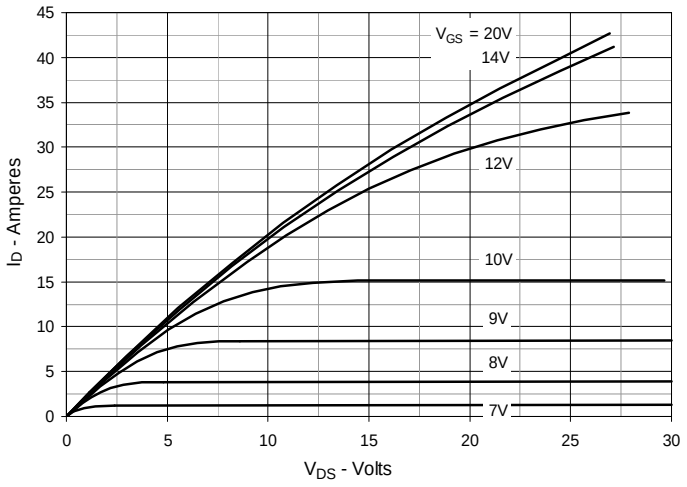



**Fig. 3. Output Characteristics @ $T_J$ = 125ºC**

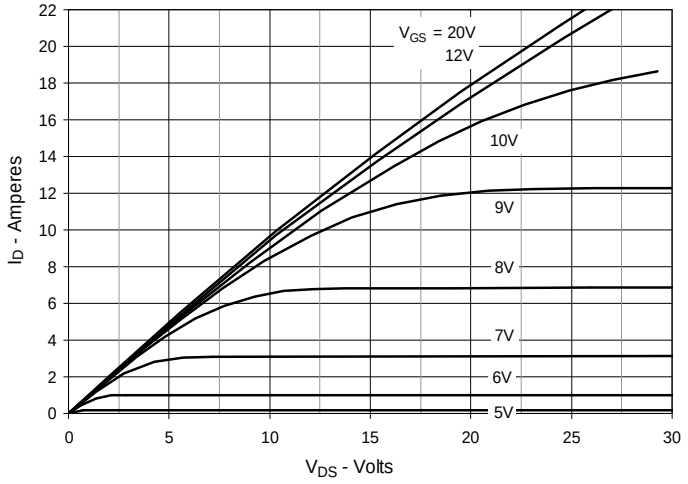



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D$ = 11A Value vs. Junction Temperature**

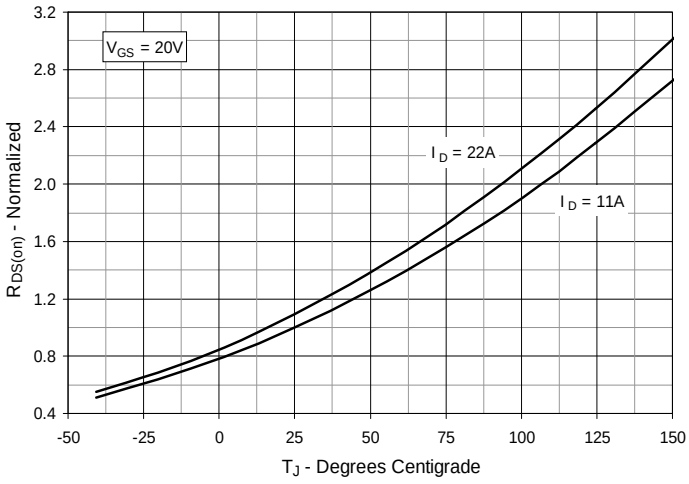



**Fig. 5. $R_{DS(on)}$ Normalized to $I_D$ = 11A Value vs. Drain Current**

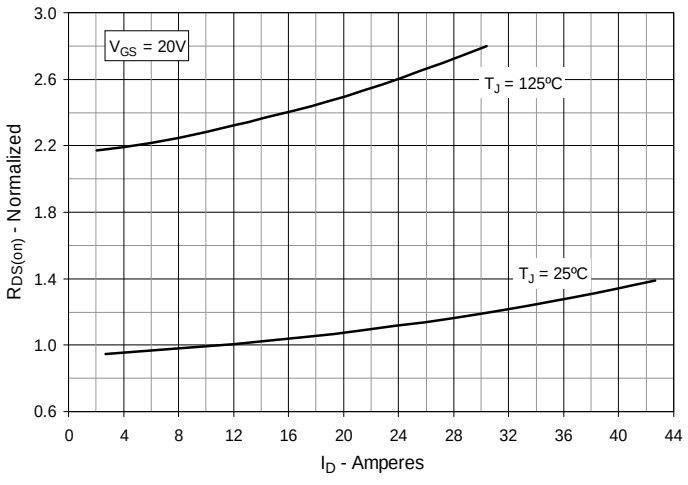



**Fig. 6. Maximum Drain Current vs. Case Temperature**

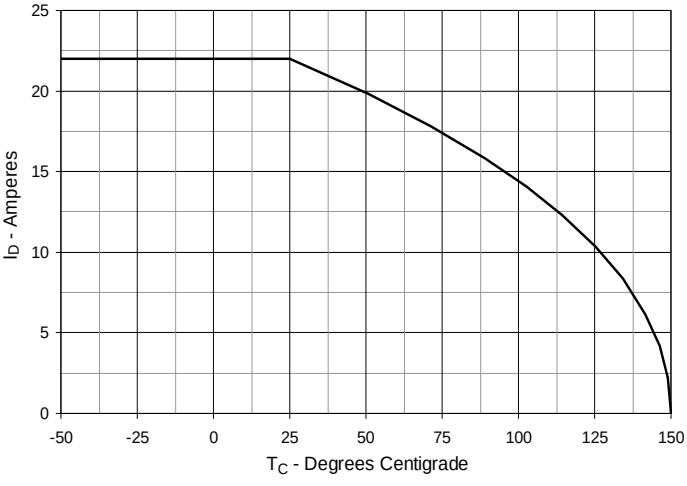


**Fig. 7. Input Admittance**

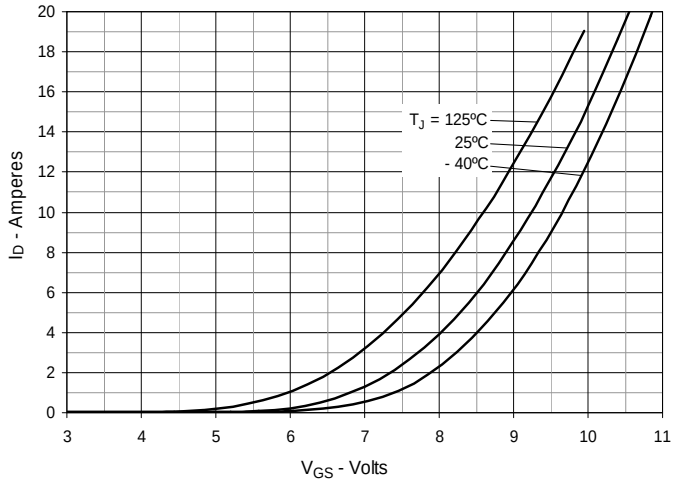



**Fig. 8. Transconductance**

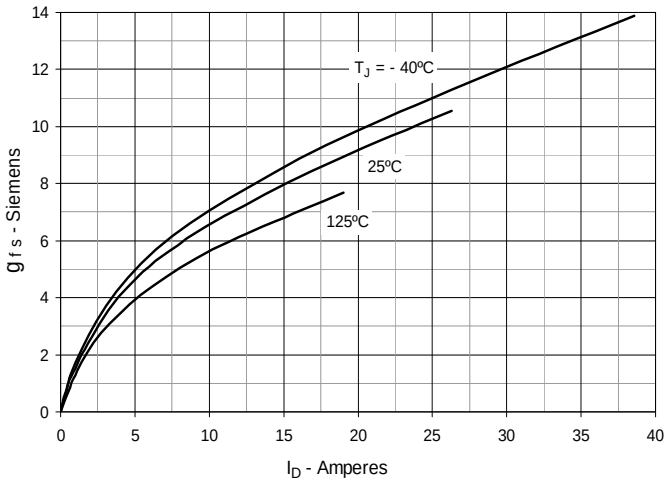



**Fig. 9. Forward Voltage Drop of Intrinsic Diode**

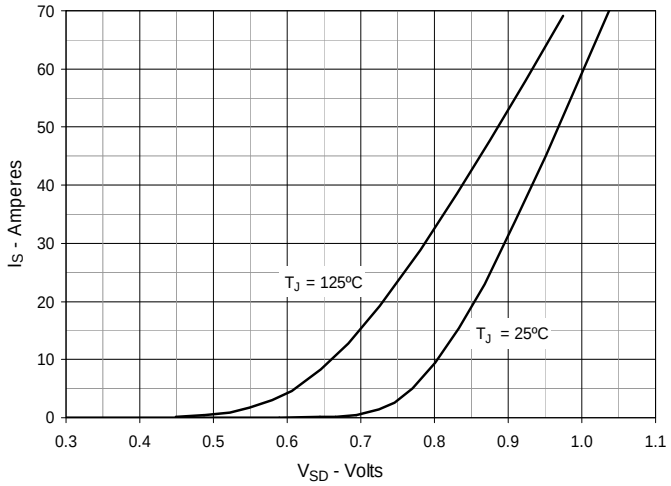



**Fig. 10. Gate Charge**

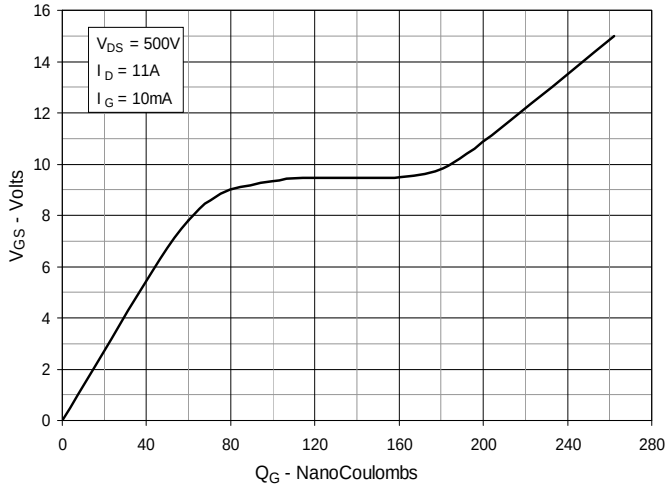



**Fig. 11. Capacitance**

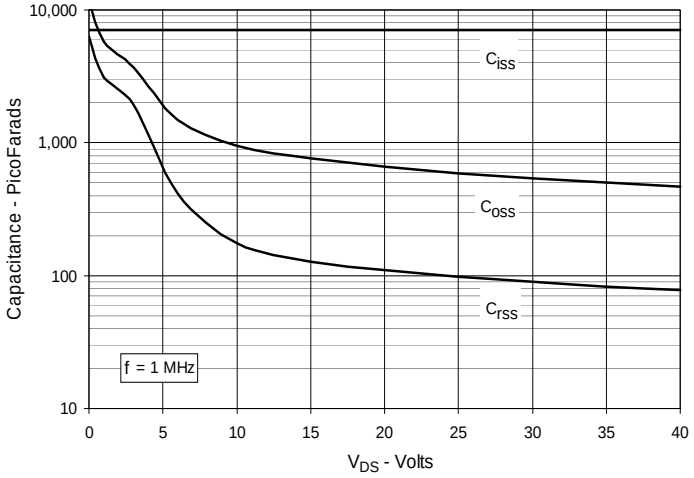



**Fig. 12. Maximum Transient Thermal Impedance**

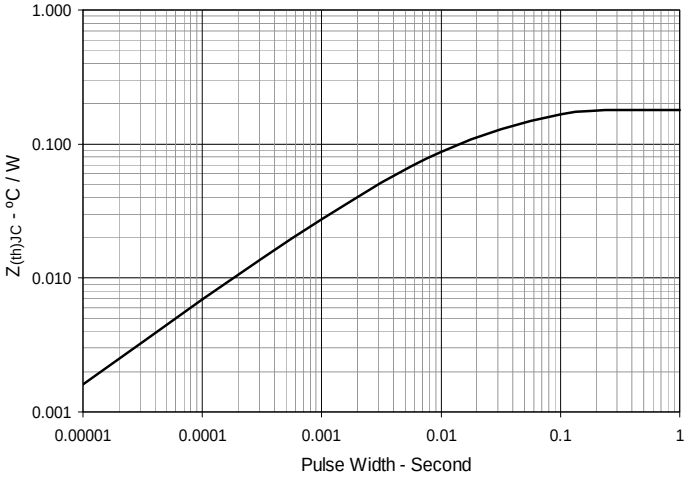


**Fig. 13. Forward-Bias Safe Operating Area @ $T_C$ = 25ºC**

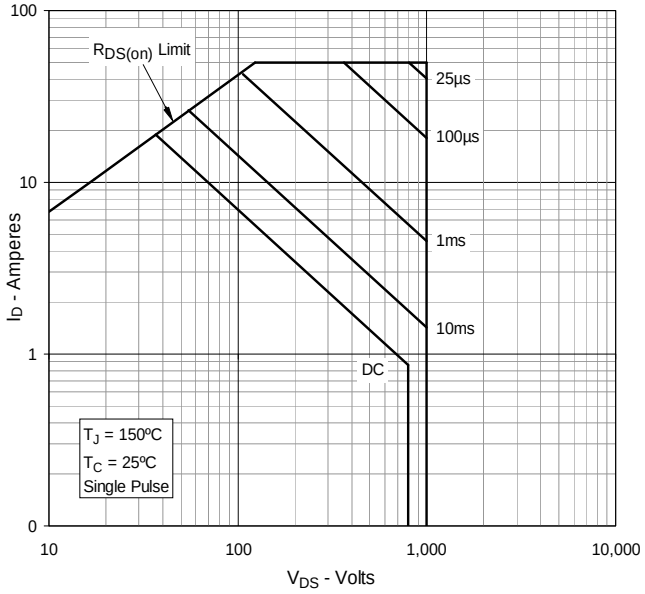



**Fig. 14. Forward-Bias Safe Operating Area @ $T_C$ = 90ºC**