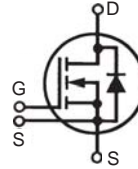


# Linear Power MOSFET IXTN30N100L With Extended FBSOA

N-Channel Enhancement Mode



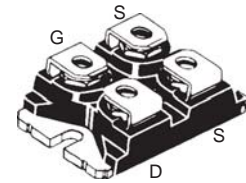
$$V_{DSS} = 1000 \text{ V}$$

$$I_{D25} = 30 \text{ A}$$

$$R_{DS(on)} \leq 0.45 \text{ } \Omega$$

| Symbol        | Test Conditions  | Maximum Ratings              |
|---------------|--|------------------------------|
| $V_{DSS}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                                | 1000 V                       |
| $V_{DGR}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$ | 1000 V                       |
| $V_{GS}$      | Continuous   | $\pm 30$ V                   |
| $V_{GSM}$     | Transient  | $\pm 40$ V                   |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$   | 30 A                         |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                     | 70 A                         |
| $I_{AR}$      | $T_C = 25^\circ\text{C}$   | 30 A                         |
| $E_{AR}$      | $T_C = 25^\circ\text{C}$   | 80 mJ                        |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$   | 2.0 J                        |
| $P_D$         | $T_C = 25^\circ\text{C}$   | 800 W                        |
| $T_J$         |  | -55 to +150 $^\circ\text{C}$ |
| $T_{JM}$      |  | 150 $^\circ\text{C}$         |
| $T_{stg}$     |  | -55 to +150 $^\circ\text{C}$ |
| $V_{ISOL}$    | 50/60 Hz, RMS, $T = 1 \text{ min}$   | 2500 V~                      |
|               | $I_{ISOL} \leq 1 \text{ mA}$ , $T = 1 \text{ s}$                               | 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.           |
| <b>Weight</b> |  | 30 g                         |

miniBLOC, SOT-227 B (IXTN)  
E153432



G = Gate  
S = Source  
D = Drain

Either Source terminal S can be used as the Source terminal or the Kelvin Source (gate return) terminal.

### Features

- Designed for linear operation
- International standard package
- Molding epoxy meets UL94 V-0 flammability classification
- miniBLOC with Aluminium nitride isolation

### Applications

- Programmable loads
- Current regulators
- DC-DC converters
- Battery chargers
- DC choppers
- Temperature and lighting controls

### Advantages

- Easy to mount
- Space savings
- High power density

| Symbol       | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                  |
|--------------|---|---|------|------------------|
|              |   | Min.  | Typ. | Max.             |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 1 \text{ mA}$           | 1000  |      | V                |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250 \text{ } \mu\text{A}$    | 3   |      | V                |
| $I_{GSS}$    | $V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0 \text{ V}$    |   |      | $\pm 200$ nA     |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0 \text{ V}$            | $T_J = 25^\circ\text{C}$  |      | 50 $\mu\text{A}$ |
|              |   | $T_J = 125^\circ\text{C}$   |      | 1 mA             |
| $R_{DS(on)}$ | $V_{GS} = 20 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Note 1 |   |      | 0.45 $\Omega$    |

| Symbol              | Test Conditions  | Characteristic Values                               |      |       |      |
|---------------------|--|---|------|-------|------|
|                     |  | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |       |      |
|                     |  | Min.  | Typ. | Max.  |      |
| g <sub>fs</sub>     | V <sub>DS</sub> = 20 V; I <sub>D</sub> = 0.5 • I <sub>D25</sub> , Note 1   | 6   | 10   | 15    | S    |
| C <sub>iss</sub>    | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz   |   | 13.7 |       | nF   |
| C <sub>oss</sub>    |  |   | 980  |       | pF   |
| C <sub>rss</sub>    |  |   | 115  |       | pF   |
| t <sub>d(on)</sub>  | V <sub>GS</sub> = 15 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub><br>R <sub>G</sub> = 2 Ω (External), |   | 36   |       | ns   |
| t <sub>r</sub>      |  |   | 70   |       | ns   |
| t <sub>d(off)</sub> |  |   | 100  |       | ns   |
| t <sub>f</sub>      |  |   | 78   |       | ns   |
| Q <sub>g(on)</sub>  | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub>                                     |   | 545  |       | nC   |
| Q <sub>gs</sub>     |  |   | 86   |       | nC   |
| Q <sub>gd</sub>     |  |   | 165  |       | nC   |
| R <sub>thJC</sub>   |  |   |      | 0.156 | °C/W |
| R <sub>thCS</sub>   |  |   | 0.05 |       | °C/W |

### Safe Operating Area Specification

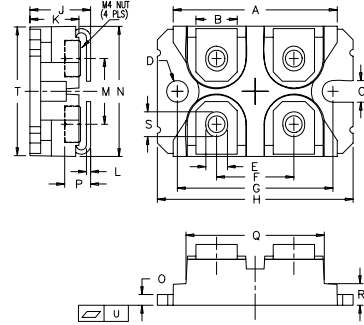
| Symbol | Test Conditions  | Min. | Typ. | Max. |
|--------|--|------|------|------|
| SOA    | V <sub>DS</sub> = 600 V, I <sub>D</sub> = 0.5 A, T <sub>C</sub> = 90°C | 300  |      | W    |

### Source-Drain Diode

| Symbol          | Test Conditions   | Characteristic Values                               |      |      |    |
|-----------------|---|---|------|------|----|
|                 |   | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |      |    |
|                 |   | Min.  | Typ. | Max. |    |
| I <sub>S</sub>  | V <sub>GS</sub> = 0 V   |   |      | 30   | A  |
| I <sub>SM</sub> | Repetitive; pulse width limited by T <sub>JM</sub>                          |   |      | 50   | A  |
| V <sub>SD</sub> | I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0 V,<br>Note 1          |   |      | 1.5  | V  |
| t <sub>rr</sub> | I <sub>F</sub> = I <sub>S</sub> , -dt/dt = 100 A/μs, V <sub>R</sub> = 100 V |   | 1000 |      | ns |

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

### SOT-227B (IXTN) Outline



(M4 screws (4x) supplied)

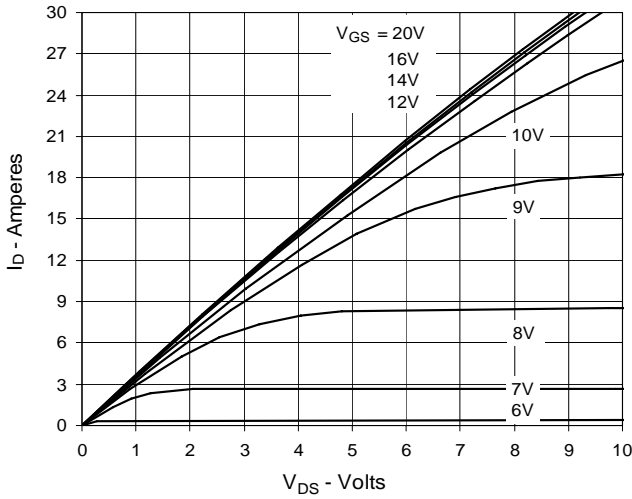
| SYM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 1.240  | 1.255 | 31.50       | 31.88 |
| B   | .307   | .323  | 7.80        | 8.20  |
| C   | .161   | .169  | 4.09        | 4.29  |
| D   | .161   | .169  | 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   |

IXYS reserves the right to change limits, test conditions, and dimensions.

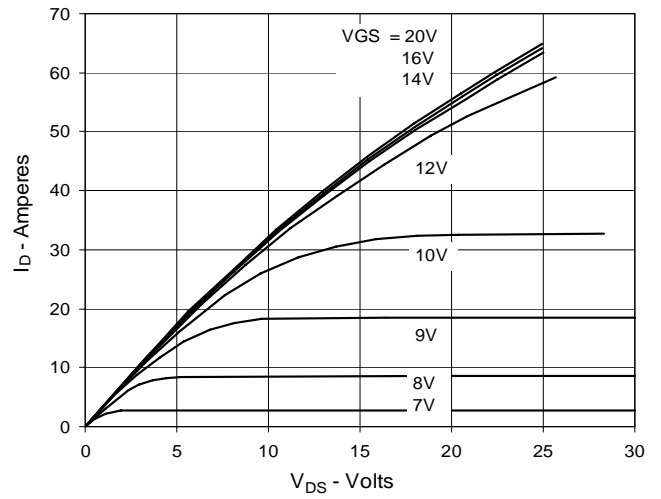
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

|           |           |           |           |              |              |              |              |              |             |
|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| 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    |             |

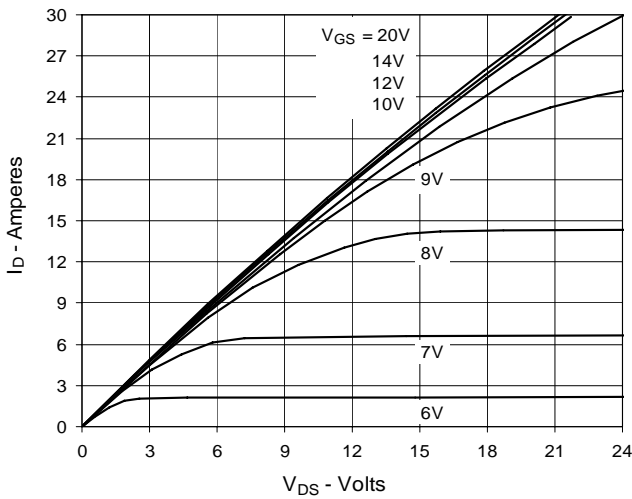
**Fig. 1. Output Characteristics @ 25°C**



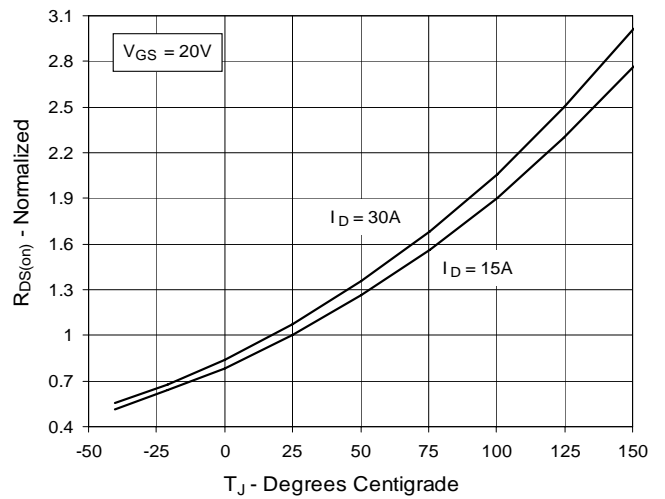
**Fig. 2. Extended Output Characteristics @ 25°C**



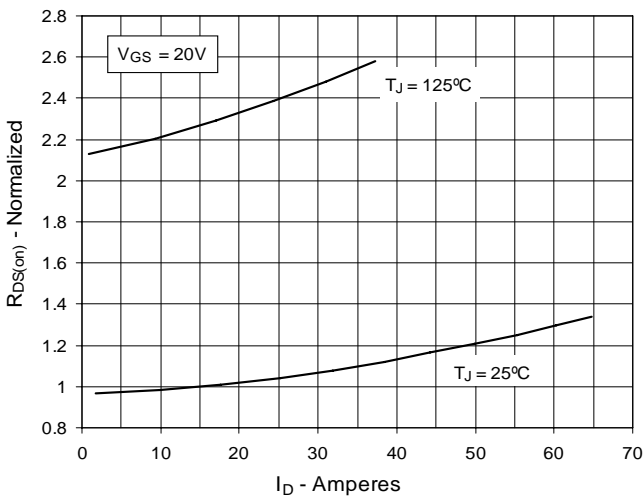
**Fig. 3. Output Characteristics @ 125°C**



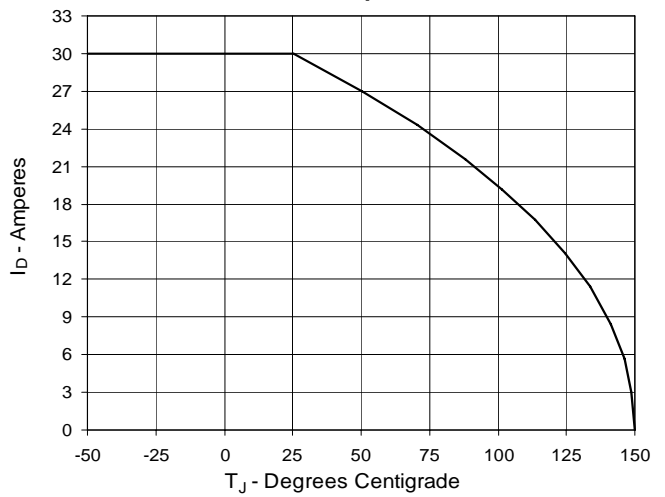
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



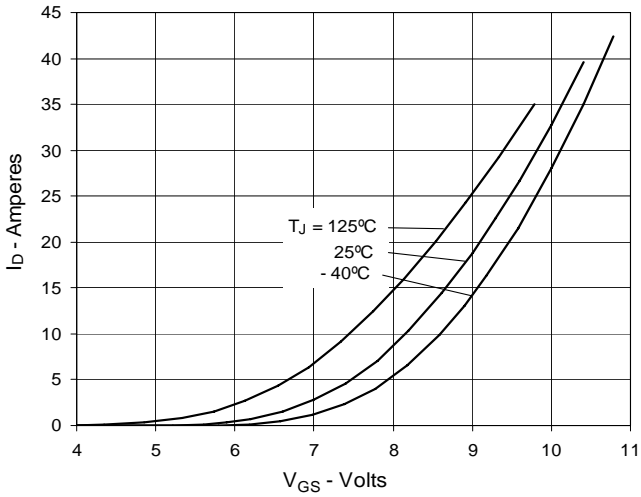
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Drain Current**



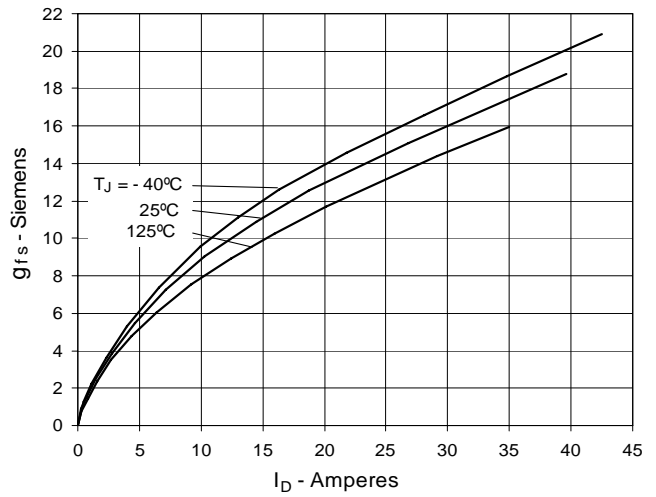
**Fig. 6. Maximum Drain Current vs. Case Temperature**



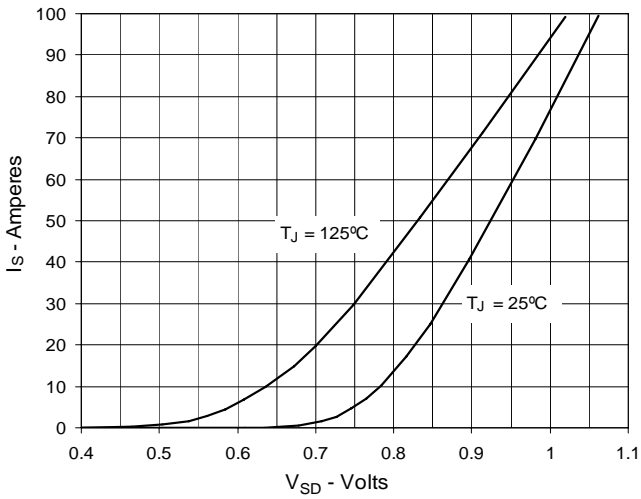
**Fig. 7. Input Admittance**



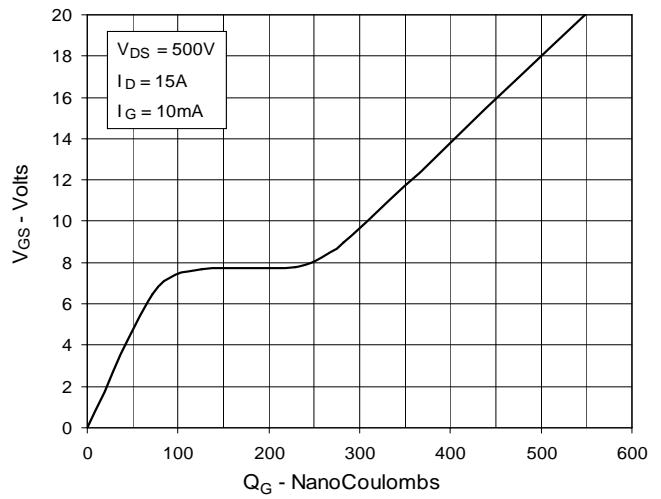
**Fig. 8. Transconductance**



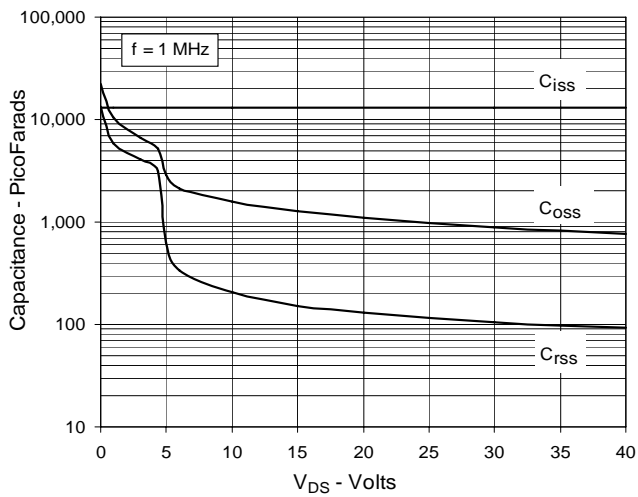
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



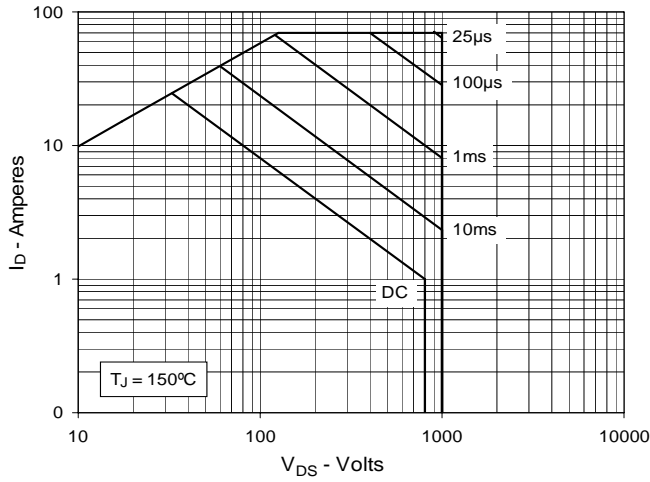
**Fig. 10. Gate Charge**



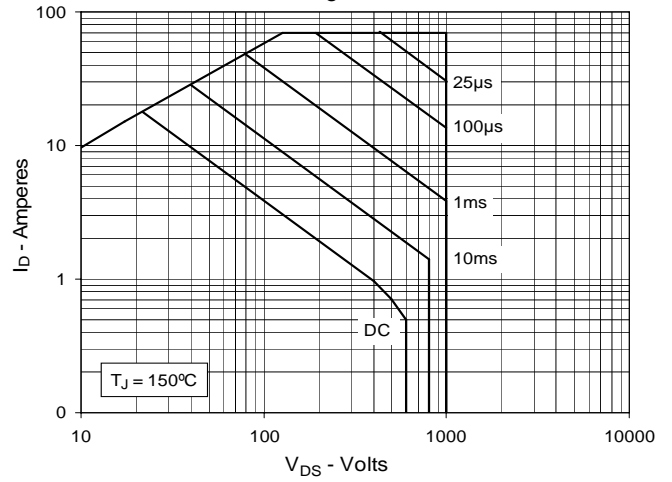
**Fig. 11. Capacitance**



**Fig. 12. Forward-Bias Safe Operating Area**  
@  $T_C = 25^\circ\text{C}$



**Fig. 13. Forward-Bias Safe Operating Area**  
@  $T_C = 90^\circ\text{C}$



**Fig. 14. Maximum Transient Thermal Impedance**

