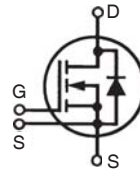


Linear™ Power MOSFET
w/ Extended FBSOA

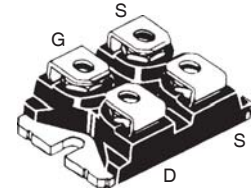
IXTN17N120L

V_{DSS} = 1200V
I_{D25} = 15A
R_{DS(on)} ≤ 900mΩ

N-Channel Enhancement Mode
Avalanche Rated
Guaranteed FBSOA



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 | 15 | A |
| I _{DM} | T _C = 25°C, Pulse Width Limited by T _{JM} | 34 | A |
| I _A | T _C = 25°C | 8.5 | A |
| E _{AS} | T _C = 25°C | 2.5 | J |
| P _D | T _C = 25°C | 540 | W |
| T _J | | -55 to +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 to +150 | °C |
| V _{ISOL} | 50/60 Hz, RMS, t = 1 minute I _{ISOL} ≤ 1mA, t = 1s | 2500 | V~ |
| | | 3000 | V~ |
| M _d | Mounting Torque for Base Plate Terminal Connection Torque | 1.5/13 | Nm/lb.in. |
| | | 1.3/11.5 | Nm/lb.in. |
| Weight | | 30 | g |

Features

- Designed for Linear Operations
- International Standard Package
- Molding Epoxies Meet UL94 V-0 Flammability Classification
- Guaranteed FBSOA at 60°C
- miniBLOC with Aluminum Nitride Isolation
- Low R_{DS(on)} HDMOS™ Process
- Rugged Polysilicon Gate Cell Structure
- Low Package Inductance

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

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

| Symbol | Test Conditions (T _J = 25°C, Unless Otherwise Specified) | Characteristic Values | | |
|---------------------|-------------------------------------------------------------------------------------|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| BV _{DSS} | V _{GS} = 0V, I _D = 1mA | 1200 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 3.0 | | 6.0 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 2 mA |
| R _{DS(on)} | V _{GS} = 20V, I _D = 8.5A, Note 1 | | | 900 mΩ |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | | |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------|------|--------------------|
| | | Min. | Typ. | Max. | |
| g_{fs} | $V_{DS} = 20\text{V}$, $I_D = 8.5\text{A}$, Note 1 | 3.5 | 5.0 | 6.5 | S |
| C_{iss} | $V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$ | | 8300 | | pF |
| C_{oss} | | | 520 | | pF |
| C_{rss} | | | 90 | | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 8.5\text{A}$ $R_G = 2\Omega$ (External) | | 42 | | ns |
| t_r | | | 31 | | ns |
| $t_{d(off)}$ | | | 110 | | ns |
| t_f | | | 83 | | ns |
| $Q_{g(on)}$ | | $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 8.5\text{A}$ | | 155 | |
| Q_{gs} | | | 41 | | nC |
| Q_{gd} | | | 60 | | nC |
| R_{thJC} | | | | 0.23 | $^\circ\text{C/W}$ |
| R_{thCS} | | 0.05 | | | $^\circ\text{C/W}$ |

Safe Operating Area Specification

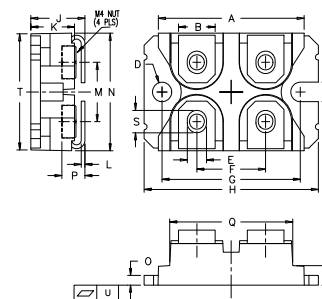
| Symbol | Test Conditions | Characteristic Values | | | |
|------------|----------------------------------------------------------------------------------------------|-----------------------|------|------|---|
| | | Min. | Typ. | Max. | |
| SOA | $V_{DS} = 800\text{V}$, $I_D = 0.23\text{A}$, $T_C = 60^\circ\text{C}$, $t_p = 3\text{s}$ | 184 | | | W |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | | |
|----------|-----------------------------------------------------------------------------|-----------------------|------|------|----|
| | | Min. | Typ. | Max. | |
| I_S | $V_{GS} = 0\text{V}$ | | | 17 | A |
| I_{SM} | Repetitive, Pulse Width Limited by T_{JM} | | | 50 | A |
| V_{SD} | $I_F = 17\text{A}$, $V_{GS} = 0\text{V}$, Note 1 | | | 1.5 | V |
| t_{rr} | $I_F = I_S$, $-di/dt = 100\text{A}/\mu\text{s}$, $V_R = 100\text{V}$ | | 1830 | | ns |

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

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 | |

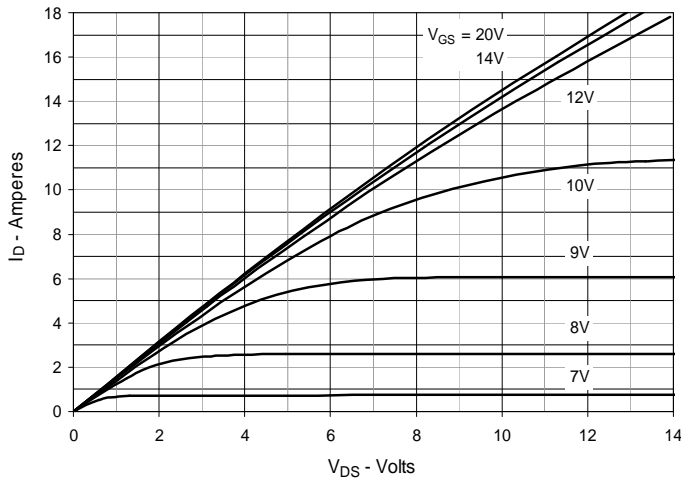
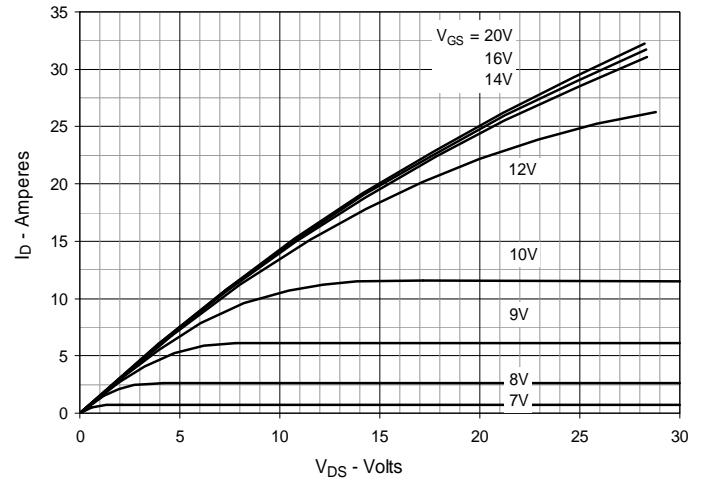
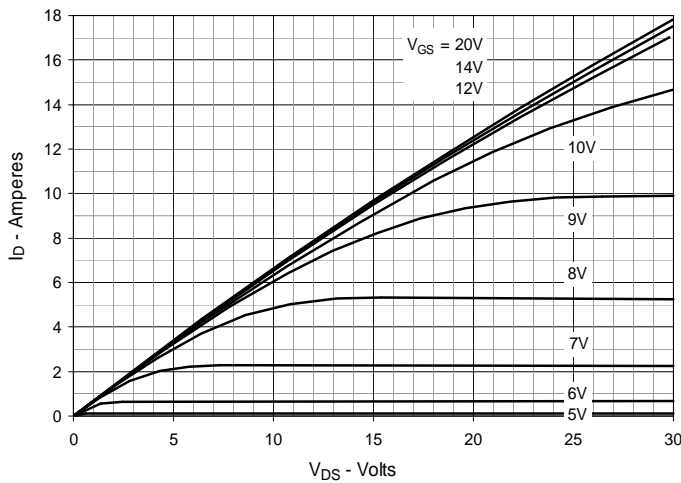
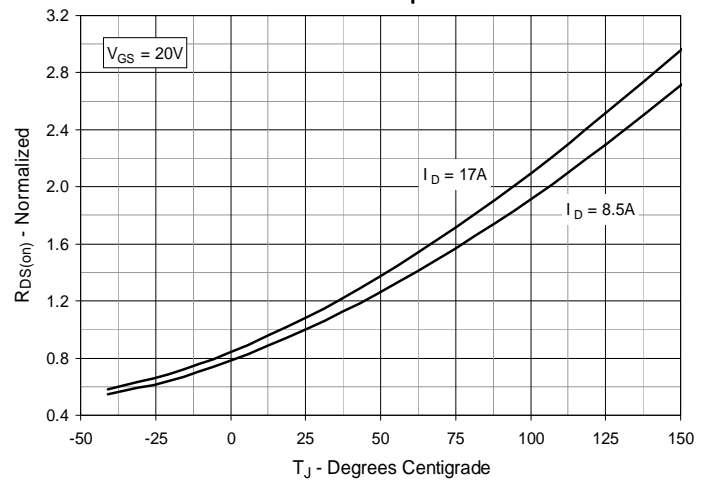
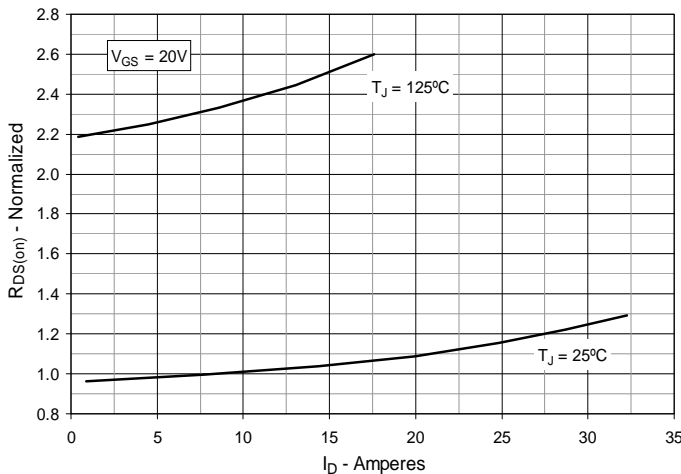
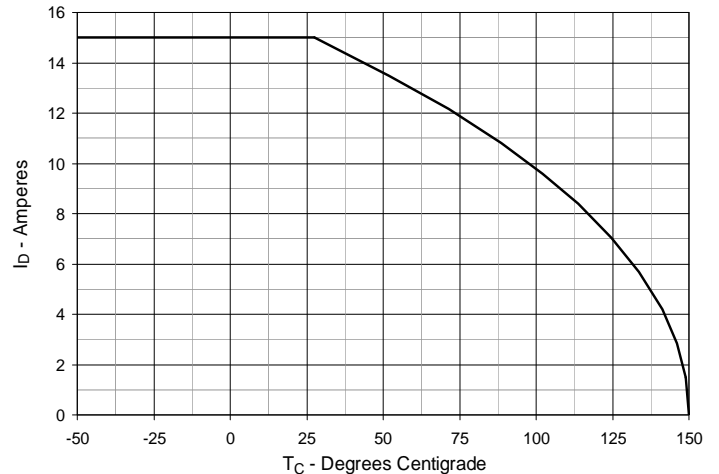
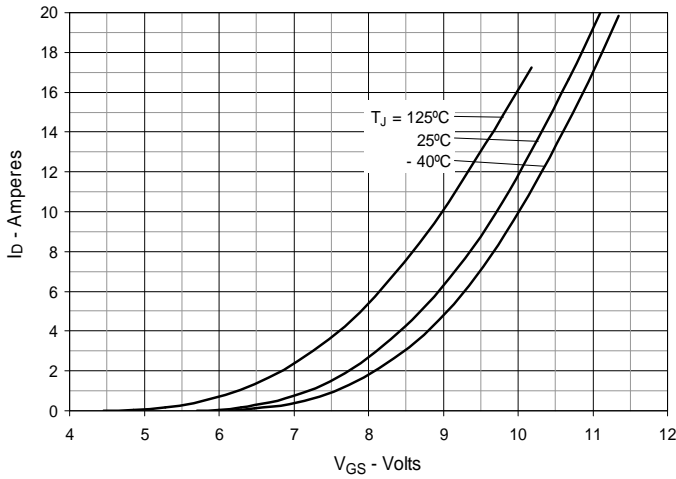
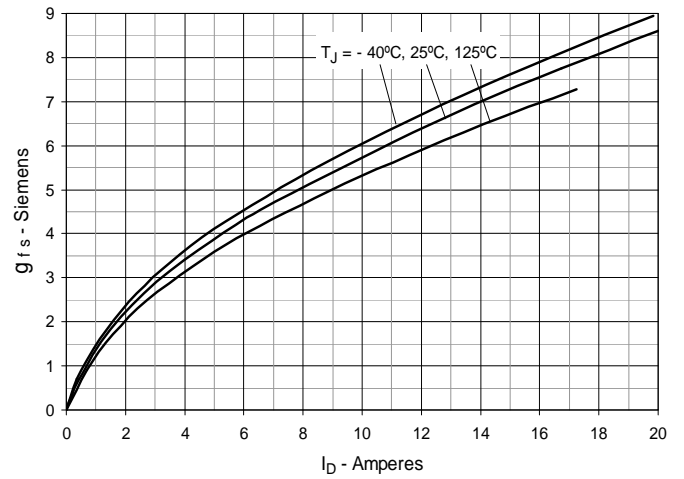
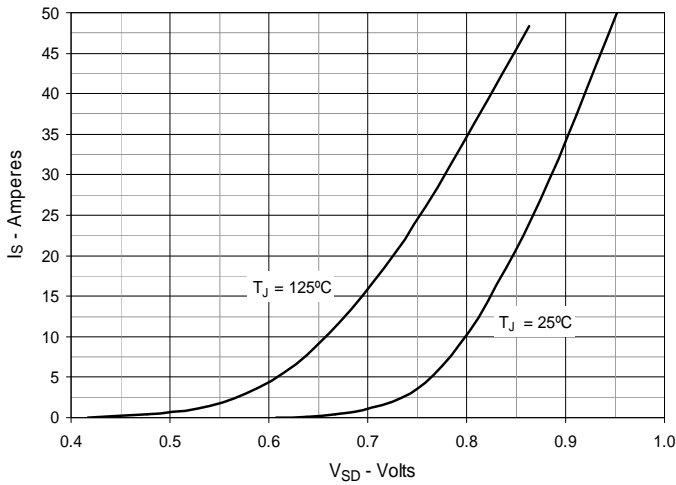
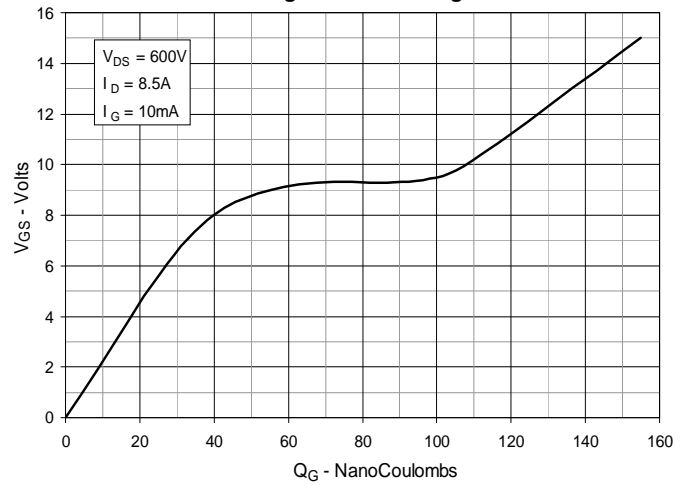
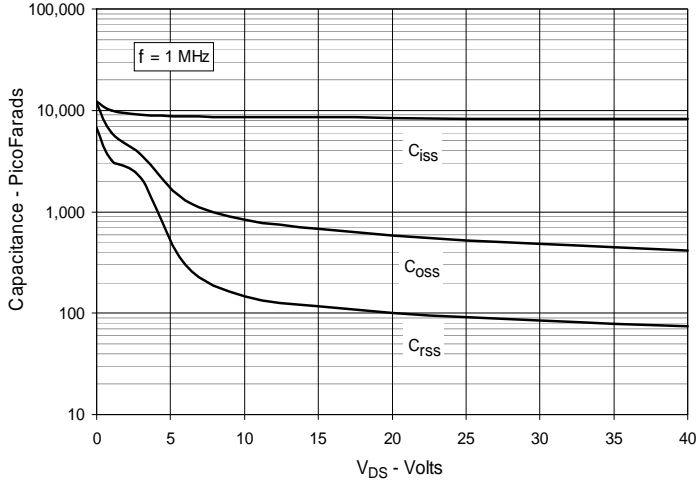
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

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 $I_D = 8.5\text{A}$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 8.5\text{A}$ 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
