

Preliminary Data

HiPerFET™ Power MOSFET

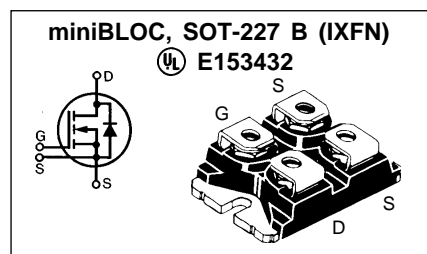
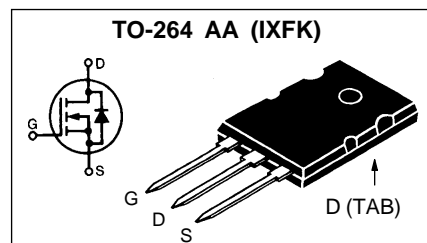
N-Channel Enhancement Mode

Avalanche Rated, High dv/dt, Low t_{rr}

| | V_{DSS} | I_{D25} | $R_{DS(on)}$ | t_{rr} |
|---------------|-----------|-----------|--------------|----------|
| IXFK/FN 36N60 | 600V | 36A | 0.18Ω | 250ns |
| IXFK/FN 32N60 | 600V | 32A | 0.25Ω | 250ns |

| Symbol | Test Conditions | Maximum Ratings | | | |
|---------------|---|-----------------|--------|-----|------------------|
| | | IXFK | IXFN | | |
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 600 | 600 | | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$ | 600 | 600 | | V |
| V_{GS} | Continuous | ±20 | ±20 | | V |
| V_{GSM} | Transient | ±30 | ±30 | | V |
| I_{D25} | $T_C = 25^\circ\text{C}$, Chip capability | 32N60 | 32 | 32 | A |
| | | 36N60 | 36 | 36 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 32N60 | 128 | 128 | A |
| | | 36N60 | 144 | 144 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 20 | 20 | | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 30 | 30 | | mJ |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2\ \Omega$ | 5 | 5 | | V/ns |
| P_D | $T_C = 25^\circ\text{C}$ | 500 | 520 | | W |
| T_J | | -55 ... | +150 | | $^\circ\text{C}$ |
| T_{JM} | | | 150 | | $^\circ\text{C}$ |
| T_{stg} | | -55 ... | +150 | | $^\circ\text{C}$ |
| T_L | 1.6 mm (0.063 in) from case for 10 s | 300 | - | | $^\circ\text{C}$ |
| V_{ISOL} | 50/60 Hz, RMSt = 1 min $I_{ISOL} \leq 1\text{ mA}$ at 1 s | - | 2500 | | V~ |
| | | - | 3000 | | V~ |
| M_d | Mounting torque | 0.9/6 | 1.5/13 | | Nm/lb.in. |
| | Terminal connection torque | - | 1.5/13 | | Nm/lb.in. |
| Weight | | 10 | 30 | | g |

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|---|------|-------------------|
| | | $(T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
| | | Min. | Typ. | Max. |
| V_{DSS} | $V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$ | 600 | | V |
| $V_{GH(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8\text{ mA}$ | 2 | | 4.5 V |
| I_{GSS} | $V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$ | | | ±200 nA |
| I_{DSS} | $V_{DS} = 0.8\text{ V}_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$ | | | 400 μA |
| | | | | 2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$, $I_D = 0.5\text{ I}_{D25}$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 36N60 | | 0.18 Ω |
| | | 32N60 | | 0.25 Ω |



G = Gate D = Drain
S = Source TAB = Drain
Either Source terminal at miniBLOC
can be used as Main or Kelvin Source

Features

- International standard packages
- JEDEC TO-264 AA, epoxy meet UL 94 V-0, flammability classification
- miniBLOC with Aluminium nitride isolation
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

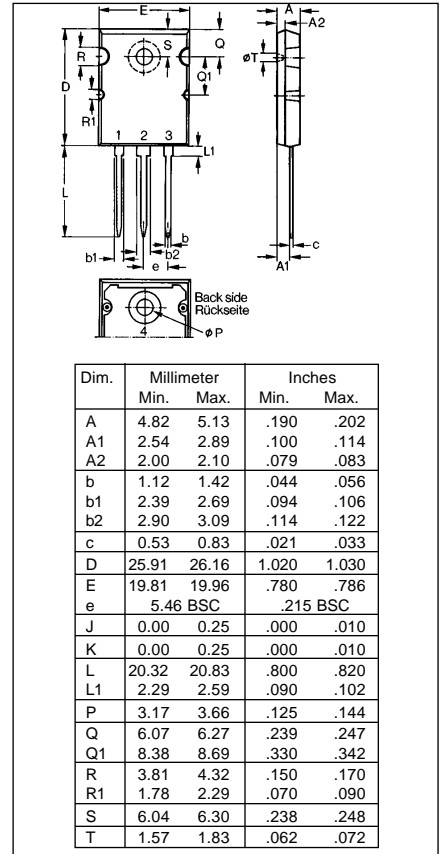
Advantages

- Easy to mount
- Space savings
- High power density

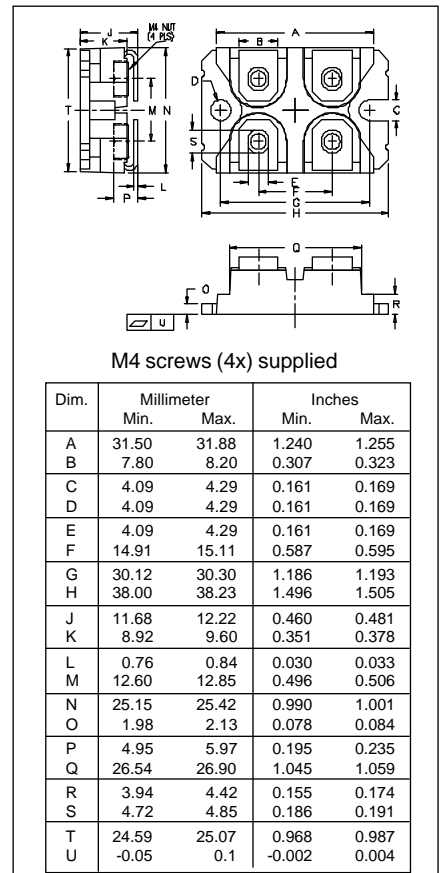
| Symbol | Test Conditions | Characteristic Values | | |
|---------------------------|--|---|------|------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| g_{fs} | V _{DS} = 10 V; I _D = 0.5 I _{D25} ; pulse test | | 36 | S |
| C_{iss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 9000 | pF |
| C_{oss} | | | 840 | pF |
| C_{rss} | | | 280 | pF |
| t_{d(on)} | V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} ; I _D = 0.5 I _{D25} R _G = 1 Ω (External), | | 30 | ns |
| t_r | | | 45 | ns |
| t_{d(off)} | | | 100 | ns |
| t_f | | | 60 | ns |
| Q_{g(on)} | V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} ; I _D = 0.5 I _{D25} | | 325 | nC |
| Q_{gs} | | | 60 | nC |
| Q_{gd} | | | 120 | nC |
| R_{thJC} | TO-264 AA | | 0.25 | K/W |
| R_{thCK} | TO-264 AA | | 0.15 | K/W |
| R_{thJC} | miniBLOC, SOT-227 B | | 0.24 | K/W |
| R_{thCK} | miniBLOC, SOT-227 B | | 0.05 | K/W |

| Symbol | Test Conditions | Characteristic Values | | |
|-----------------------|---|---|------|-------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | Min. | Typ. | Max. |
| I_S | V _{GS} = 0 | 36N60 | | 36 A |
| I_S | V _{GS} = 0 | 32N60 | | 32 A |
| I_{SM} | Repetitive; pulse width limited by T _{JM} | 36N60 | | 144 A |
| | | 32N60 | | 128 A |
| V_{SD} | I _F = I _S A, V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | 1.5 V |
| t_{rr} | I _F = I _S , -di/dt = 100 A/μs, V _R = 100 V | | 20 | ns |
| I_{RM} | | | | |

TO-264 AA Outline



miniBLOC, SOT-227 B



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 | 4,881,106 | 5,017,508 | 5,049,961 | 5,187,117 | 5,486,715 |
| 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 |

Fig.1. Output Characteristics

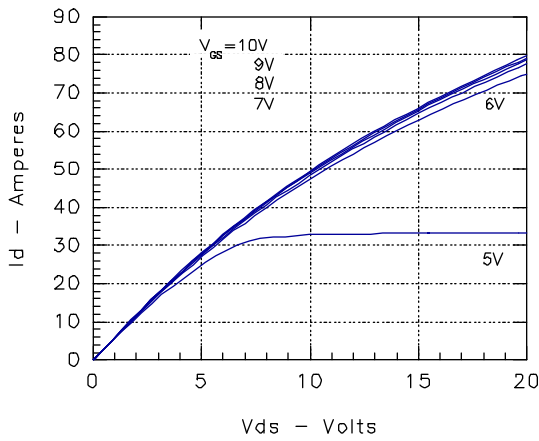


Fig. 2. Input Admittance

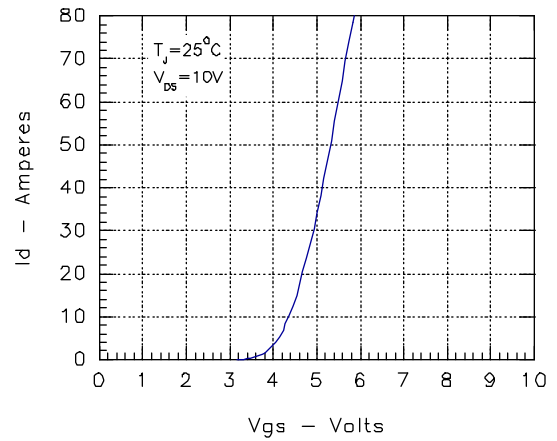


Fig. 3. Rds(on) vs. Drain Current

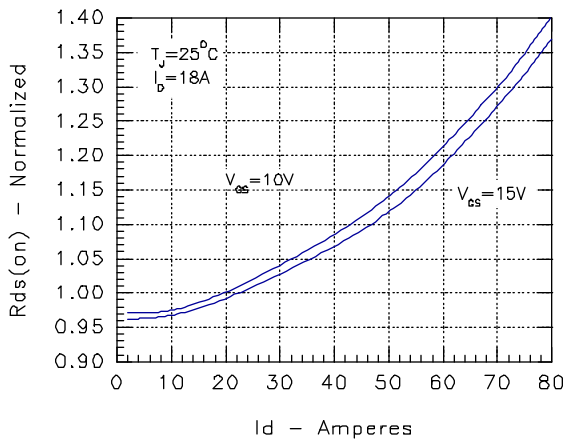


Fig. 4. Temperature Dependence of Drain to Source Resistance

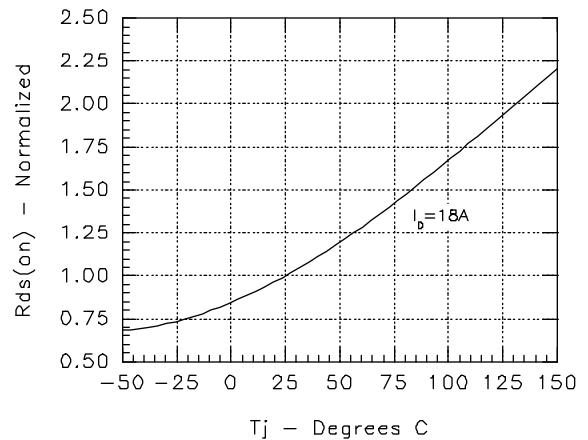


Fig. 5. Drain Current vs. Case Temperature

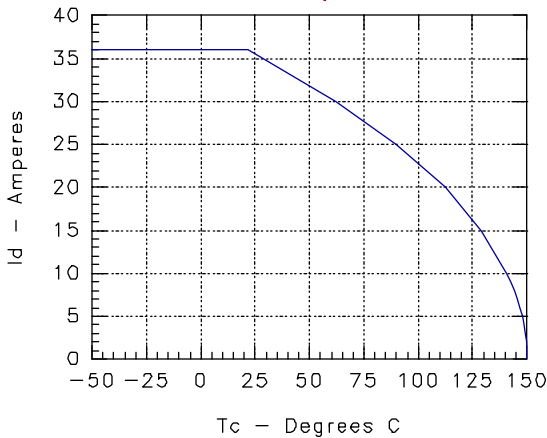
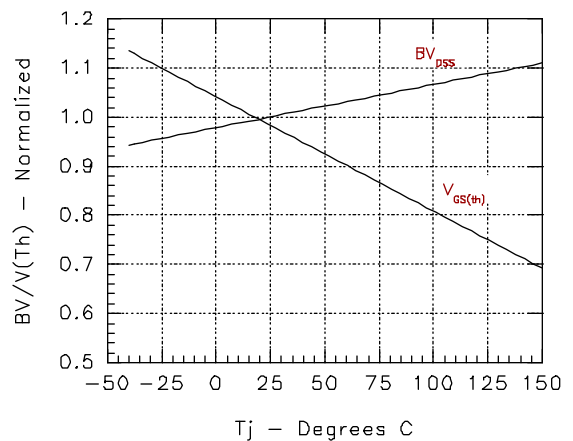


Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage



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Fig. 7. Gate Charge

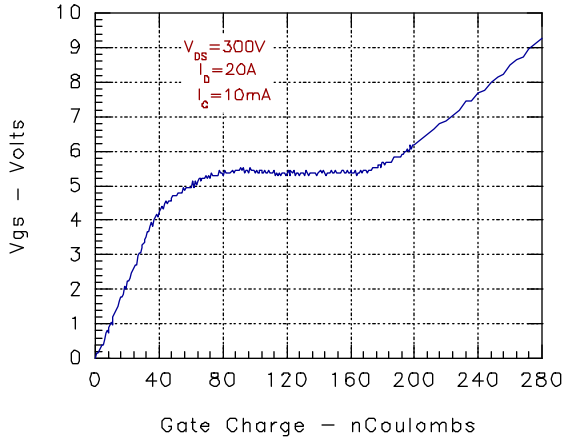


Fig. 8. Capacitance Curves

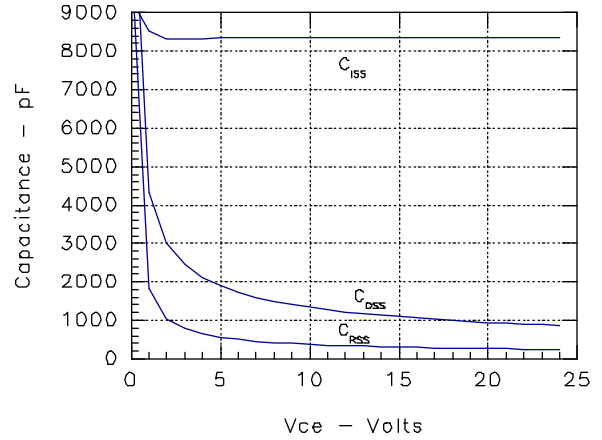


Fig. 9. Source Current vs. Source to Drain Voltage

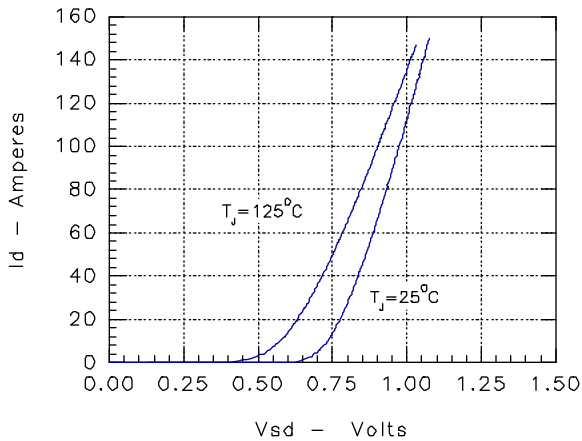
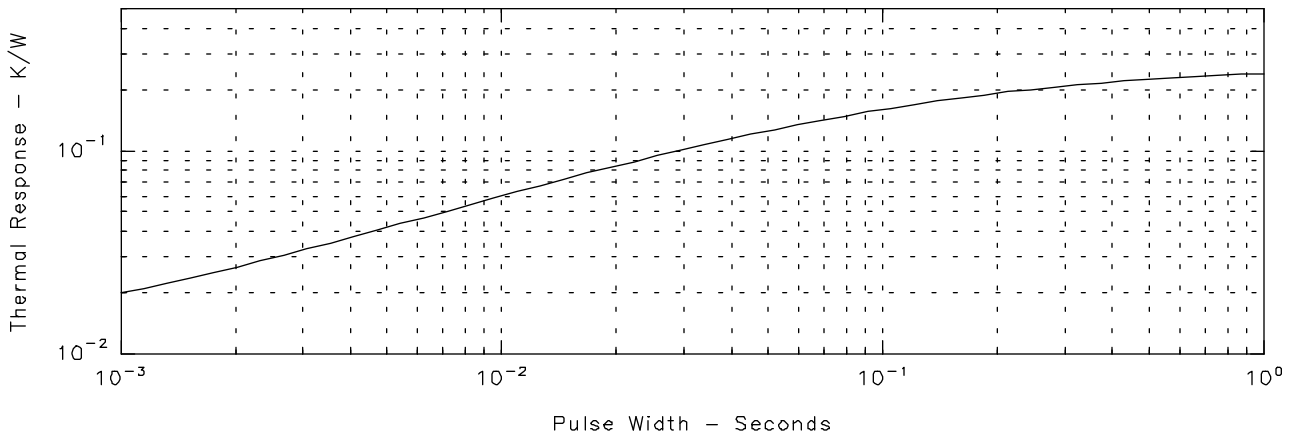


Fig. 10. Transient Thermal Impedance



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