IXYS

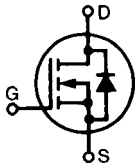
# HiPerFET™ Power MOSFETs

**IXFX 44N60**
**IXFK 44N60**

$V_{DSS}$ = 600 V
$I_{D25}$ = 44 A
$R_{DS(on)}$ = 130 mΩ

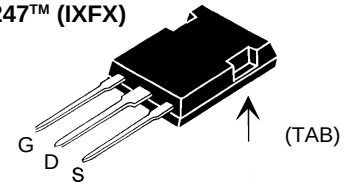
$t_{rr} \leq$ 250 ns

Single MOSFET Die

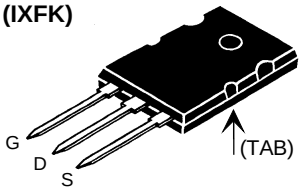



| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | 600 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C; $R_{GS}$ = 1 MΩ | 600 | V |
| $V_{GS}$ | Continuous | ±20 | V |
| $V_{GSM}$ | Transient | ±30 | V |
| $I_{D25}$ | $T_C$ = 25°C | 44 | A |
| $I_{DM}$ | $T_C$ = 25°C, pulse width limited by $T_{JM}$ | 176 | A |
| $I_{AR}$ | $T_C$ = 25°C | 44 | A |
| $E_{AR}$ | $T_C$ = 25°C | 60 | mJ |
| $E_{AS}$ | $T_C$ = 25°C | 3 | J |
| dv/dt | $I_S \leq I_{DM}$, di/dt ≤ 100 A/μs, $V_{DD} \leq V_{DSS}$ $T_J \leq$ 150°C, $R_G$ = 2 Ω | 5 | V/ns |
| $P_D$ | $T_C$ = 25°C | 560 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| $T_L$ | 1.6 mm (0.063 in.) from case for 10 s | 300 | °C |
| $M_d$ | Mounting torque TO-264 | 0.4/6 | Nm/lb.in. |
| Weight | PLUS 247 | 6 | g |
| | TO-264 | 10 | g |

**PLUS 247™ (IXFX)**




**TO-264 AA (IXFK)**




G = Gate D = Drain
S = Source TAB = Drain

**Features**
- International standard packages
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect
- Fast intrinsic rectifier

**Applications**
- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls

**Advantages**
- PLUS 247™ package for clip or spring mounting
- Space savings
- High power density

| Symbol | Test Conditions | | Characteristic Values ($T_J$ = 25°C, unless otherwise specified) min. | typ. | max. |
|---|---|---|---|---|---|
| $V_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 3mA | | 600 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 8mA | | 2.5 | | 4.5 V |
| $I_{GSS}$ | $V_{GS}$ = ±20 V, $V_{DS}$ = 0 | | | | ±100 nA |
| $I_{DSS}$ | $V_{DS} = V_{DSS}$ | $T_J$ = 25°C | | | 100 μA |
| | $V_{GS}$ = 0 V | $T_J$ = 125°C | | | 2 mA |
| $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D = 0.5 \bullet I_{D25}$ Note 1 | | | | 130 mΩ |

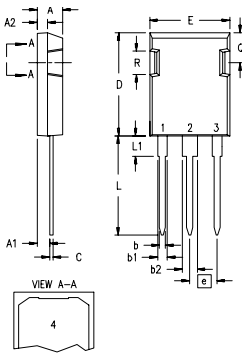
| Symbol | Test Conditions ($T_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 10 V; $I_D$ = 0.5 • $I_{D25}$ Note 1 | 30 | 45 | | S |
| $C_{iss}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz | | 8900 | | pF |
| $C_{oss}$ | | | 1000 | | pF |
| $C_{rss}$ | | | 330 | | 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), | | 40 | | ns |
| $t_r$ | | | 50 | | ns |
| $t_{d(off)}$ | | | 100 | | ns |
| $t_f$ | | | 40 | | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 • $I_{D25}$ | | 330 | | nC |
| $Q_{gs}$ | | | 60 | | nC |
| $Q_{gd}$ | | | 65 | | nC |
| $R_{thJC}$ | | | | 0.22 | K/W |
| $R_{thCK}$ | | | 0.15 | | K/W |

**Source-Drain Diode**

| Symbol | Test Conditions ($T_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0 V | | | 44 | A |
| $I_{SM}$ | Repetitive; pulse width limited by $T_{JM}$ | | | 176 | A |
| $V_{SD}$ | $I_F = I_S$, $V_{GS}$ = 0 V, Note 1 | | | 1.3 | V |
| $t_{rr}$ | $I_F$ = 50A,-di/dt = 100 A/µs, $V_R$ = 100 V | | | 250 | ns |
| $Q_{RM}$ | | | 1.4 | | µC |
| $I_{RM}$ | | | 8 | | A |

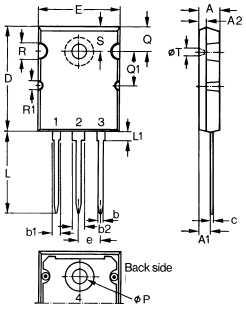
Note: 1. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %

**PLUS247™ (IXFX) Outline**




| Dim. | Millimeter Min. | Max. | Inches Min. | Max. |
|---|---|---|---|---|
| A | 4.83 | 5.21 | .190 | .205 |
| $A_1$ | 2.29 | 2.54 | .090 | .100 |
| $A_2$ | 1.91 | 2.16 | .075 | .085 |
| b | 1.14 | 1.40 | .045 | .055 |
| $b_1$ | 1.91 | 2.13 | .075 | .084 |
| $b_2$ | 2.92 | 3.12 | .115 | .123 |
| C | 0.61 | 0.80 | .024 | .031 |
| D | 20.80 | 21.34 | .819 | .840 |
| E | 15.75 | 16.13 | .620 | .635 |
| e | 5.45 BSC | | .215 BSC | |
| L | 19.81 | 20.32 | .780 | .800 |
| L1 | 3.81 | 4.32 | .150 | .170 |
| Q | 5.59 | 6.20 | .220 | .244 |
| R | 4.32 | 4.83 | .170 | .190 |

**TO-264 AA (IXFK) Outline**




| Dim. | Millimeter Min. | Max. | Inches Min. | Max. |
|---|---|---|---|---|
| A | 4.82 | 5.13 | .190 | .202 |
| A1 | 2.54 | 2.89 | .100 | .114 |
| A2 | 2.00 | 2.10 | .079 | .083 |
| b | 1.12 | 1.42 | .044 | .056 |
| b1 | 2.39 | 2.69 | .094 | .106 |
| b2 | 2.90 | 3.09 | .114 | .122 |
| c | 0.53 | 0.83 | .021 | .033 |
| D | 25.91 | 26.16 | 1.020 | 1.030 |
| E | 19.81 | 19.96 | .780 | .786 |
| e | 5.46 BSC | | .215 BSC | |
| J | 0.00 | 0.25 | .000 | .010 |
| K | 0.00 | 0.25 | .000 | .010 |
| L | 20.32 | 20.83 | .800 | .820 |
| L1 | 2.29 | 2.59 | .090 | .102 |
| P | 3.17 | 3.66 | .125 | .144 |
| Q | 6.07 | 6.27 | .239 | .247 |
| Q1 | 8.38 | 8.69 | .330 | .342 |
| R | 3.81 | 4.32 | .150 | .170 |
| R1 | 1.78 | 2.29 | .070 | .090 |
| S | 6.04 | 6.30 | .238 | .248 |
| T | 1.57 | 1.83 | .062 | .072 |

Figure 1. Output Characteristics at 25°C

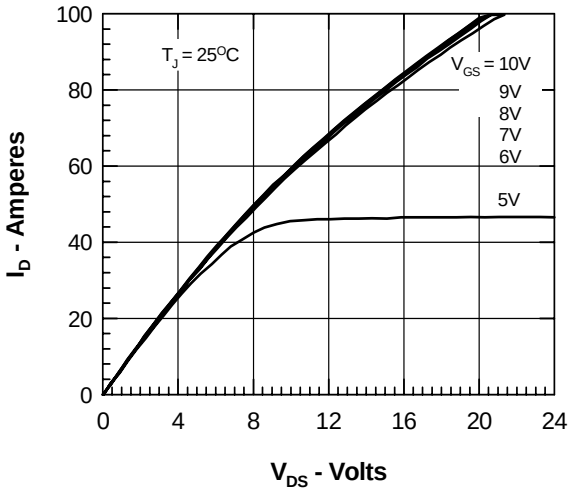



Figure 2. Output Characteristics at 125°C

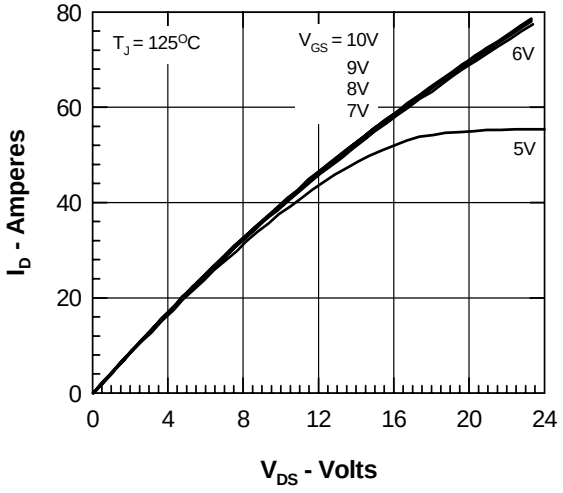



Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. $I_D$

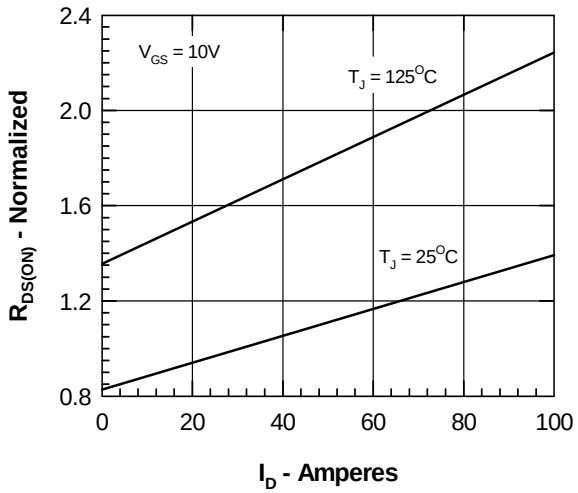



Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. $T_J$

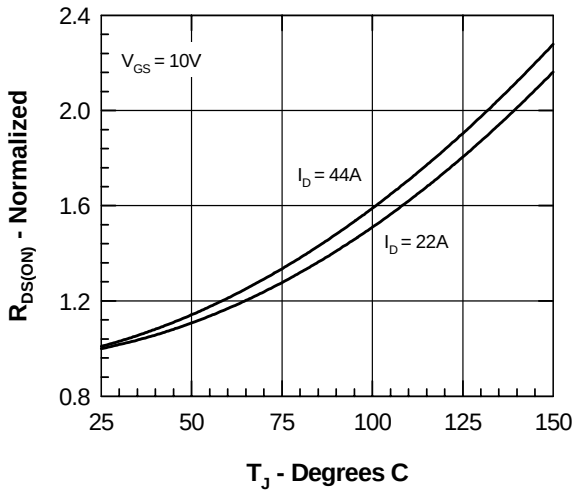



Figure 5. Drain Current vs. Case Temperature

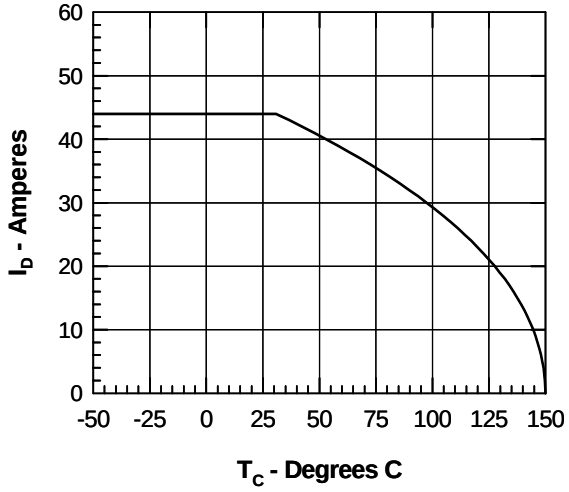



Figure 6. Admittance Curves

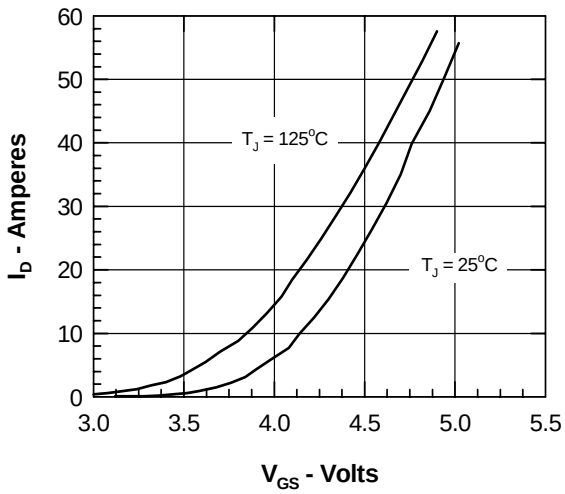


Figure 7. Gate Charge

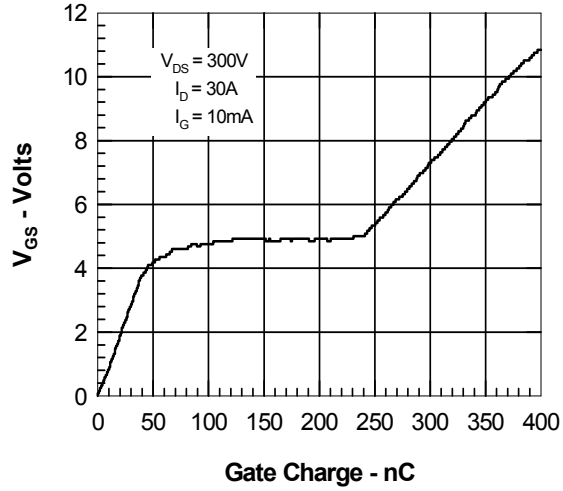



Figure 8. Capacitance Curves

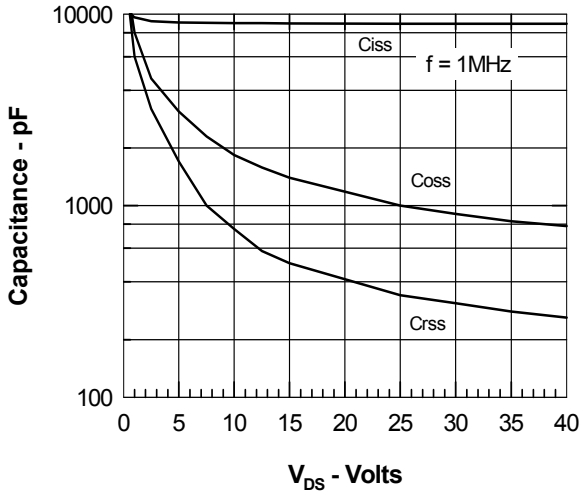



Figure 9. Forward Voltage Drop of the Intrinsic Diode

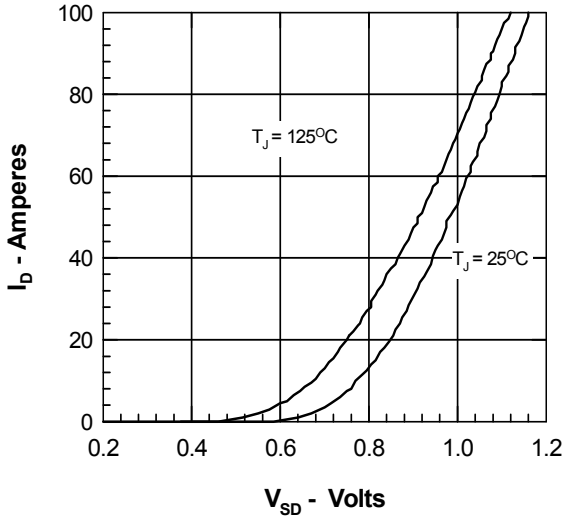
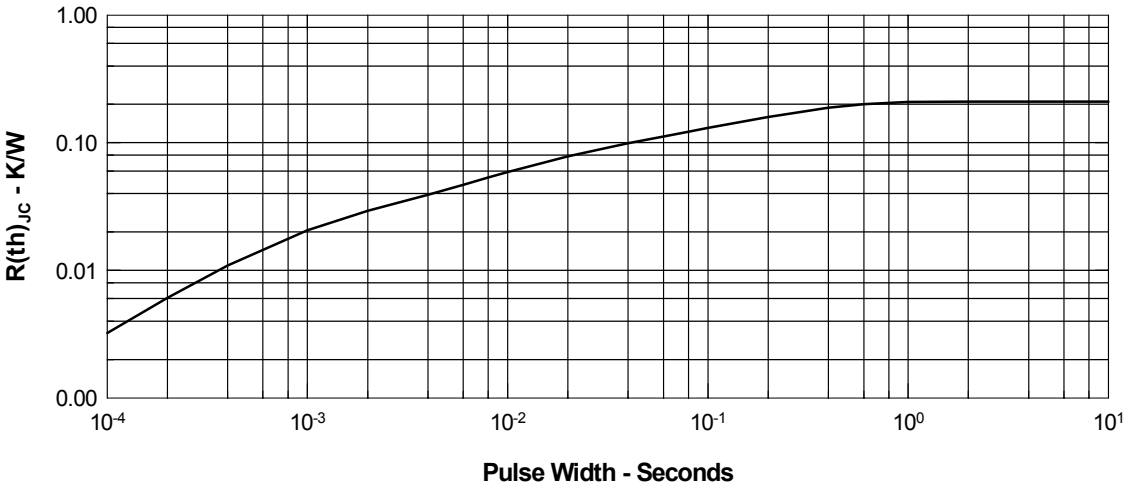



Figure 10. Transient Thermal Resistance



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

IXYS:

IXFK44N60 IXFX44N60