# IXYS

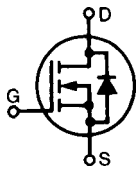
## HiPerFET™ Power MOSFETs

## IXFJ 40N30

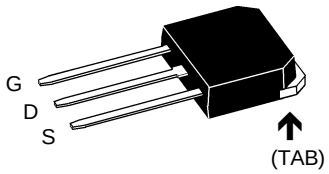
$V_{DSS}$ = 300 V
$I_{D25}$ = 40 A
$R_{DS(on)}$ = 80 mΩ
$t_{rr}$ < 200 ns

N-Channel Enhancement Mode
High dv/dt, Low $t_{rr}$, HDMOS™ Family

Preliminary data sheet




| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | 300 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C; $R_{GS}$ = 1 MΩ | 300 | V |
| $V_{GS}$ | Continuous | ±20 | V |
| $V_{GSM}$ | Transient | ±30 | V |
| $I_{D25}$ | $T_C$ = 25°C | 40 | A |
| $I_{DM}$ | $T_C$ = 25°C, pulse width limited by $T_{JM}$ | 160 | A |
| $I_{AR}$ | $T_C$ = 25°C | 40 | A |
| $E_{AR}$ | $T_C$ = 25°C | 30 | mJ |
| dv/dt | $I_S \le I_{DM}$, di/dt ≤ 100 A/μs, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$, $R_G$ = 2 Ω | 5 | V/ns |
| $P_D$ | $T_C$ = 25°C | 300 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| $T_L$ | 1.6 mm (0.062 in.) from case for 10 s | 300 | °C |
| Weight | | 5 | g |




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

| Symbol | Test Conditions | | Characteristic Values ($T_J$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|---|
| $V_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 250 μA | | 300 | | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 4 mA | | 2 | | 4 | V |
| $I_{GSS}$ | $V_{GS}$ = ±20 $V_{DC}$, $V_{DS}$ = 0 | | | | ±100 | nA |
| $I_{DSS}$ | $V_{DS}$ = 0.8 • $V_{DSS}$ | $T_J$ = 25°C | | | 200 | μA |
| | $V_{GS}$ = 0 V | $T_J$ = 125°C | | | 1 | mA |
| $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 0.5 $I_{D25}$ Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | | 80 | mΩ |

### Features

- Low profile, high power package
- Long creep and strike distances
- Easy up-grade path for TO-220 designs
- 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
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls
- Low voltage relays

### Advantages

- High power, low profile package
- Space savings
- High power density

IXYS reserves the right to change limits, test conditions, and dimensions. 98536 1/99)

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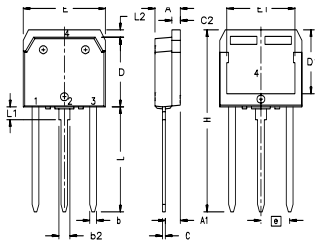
| Symbol | Test Conditions ($T_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 10 V; $I_D$ = 0.5 $I_{D25}$, pulse test | 22 | 25 | | S |
| $C_{iss}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz | | 4800 | | pF |
| $C_{oss}$ | | | 745 | | pF |
| $C_{rss}$ | | | 280 | | pF |
| $t_{d(on)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 $I_{D25}$<br>$R_G$ = 2 Ω (External) | | 20 | 30 | ns |
| $t_r$ | | | 60 | 90 | ns |
| $t_{d(off)}$ | | | 75 | 100 | ns |
| $t_f$ | | | 45 | 90 | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 0.5 $I_{D25}$ | | 177 | 200 | nC |
| $Q_{gs}$ | | | 28 | 50 | nC |
| $Q_{gd}$ | | | 78 | 105 | nC |
| $R_{thJC}$ | | | | 0.42 | K/W |
| $R_{thCK}$ | | | 0.25 | | 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 | | | 40 | A |
| $I_{SM}$ | Repetitive;<br>pulse width limited by $T_{JM}$ | | | 160 | A |
| $V_{SD}$ | $I_F$ = $I_S$, $V_{GS}$ = 0 V,<br>Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 % | | | 1.5 | V |
| $t_{rr}$ | $I_F$ = $I_S$, -di/dt = 100 A/µs, $T_J$ = 25°C<br>$V_R$ = 100 V $T_J$ = 125°C | | | 200<br>350 | ns<br>ns |

**characteristic curves are located in the IXFH 40N30 data sheet.**

**TO-268 Outline**






All metal area are solder plated
1 - gate
2 - drain (collector)
3 - source (emitter)
4 - drain (collector)

| Dim. | Inches Min | Max | Millimeters Min | Max |
|---|---|---|---|---|
| A | .193 | .201 | 4.90 | 5.10 |
| A1 | .106 | .114 | 2.70 | 2.90 |
| b | .045 | .057 | 1.15 | 1.45 |
| b2 | .075 | .083 | 1.90 | 2.10 |
| C | .016 | .026 | .040 | .065 |
| C2 | .057 | .063 | 1.45 | 1.60 |
| D | .543 | .551 | 13.80 | 14.00 |
| D1 | .488 | .500 | 12.40 | 12.70 |
| E | .624 | .632 | 15.85 | 16.05 |
| E1 | .524 | .535 | 13.30 | 13.60 |
| e | .215 BSC | | 5.45 BSC | |
| H | 1.365 | 1.395 | 34.67 | 35.43 |
| L | .780 | .800 | 19.81 | 20.32 |
| L1 | .079 | .091 | 2.00 | 2.30 |
| L2 | .039 | .045 | 1.00 | 1.15 |

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