IXYS

# HiPerFET™ Power MOSFETs

## IXFK 48N55
## IXFX 48N55

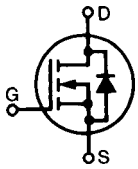
$V_{DSS}$ = 550 V
$I_{D25}$ = 48 A
$R_{DS(on)}$ = 110 mΩ

$t_{rr} \leq$ 250 ns

Single MOSFET Die

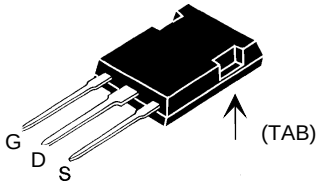
Avalanche Rated

Preliminary data

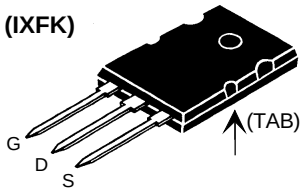



| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | 550 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C; $R_{GS}$ = 1 MΩ | 550 | V |
| $V_{GS}$ | Continuous | ±20 | V |
| $V_{GSM}$ | Transient | ±30 | V |
| $I_{D25}$ | $T_C$ = 25°C | 48 | A |
| $I_{DM}$ | $T_C$ = 25°C, pulse width limited by $T_{JM}$ | 192 | 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 | 0.9/6 | Nm/lb.in. |
| Weight | PLUS 247 | 6 | g |
| | TO-264 | 10 | g |

**PLUS 247™ (IXFK)**




**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 ($T_J$ = 25°C, unless otherwise specified) | Characteristic Values min. | typ. | max. |
|---|---|---|---|---|
| $V_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 3mA | 550 | | 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 | | | ±200 nA |
| $I_{DSS}$ | $V_{DS} = V_{DSS}$ $V_{GS}$ = 0 V $T_J$ = 125°C | | | 100 μA 2 mA |
| $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D = 0.5 \bullet I_{D25}$ Note 1 | | | 110 mΩ |

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



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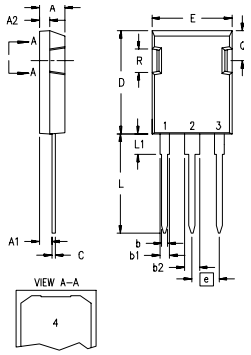
| Symbol | Test Conditions ($T_J$ = 25°C, unless otherwise specified) | min. | typ. | max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 10 V; $I_D$ = 0.5 • $I_{D25}$ Note 1 | 30 | 40 | | S |
| $C_{iss}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz | | 8900 | | pF |
| $C_{oss}$ | | | 1000 | | 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), | | 42 | | ns |
| $t_r$ | | | 55 | | ns |
| $t_{d(off)}$ | | | 110 | | ns |
| $t_f$ | | | 45 | | 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) | min. | typ. | max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0 V | | | 48 | A |
| $I_{SM}$ | Repetitive; pulse width limited by $T_{JM}$ | | | 192 | A |
| $V_{SD}$ | $I_F = I_S$, $V_{GS}$ = 0 V, Note 1 | | | 1.3 | V |
| $t_{rr}$ | $I_F = I_S$, -di/dt = 100 A/µs, $V_R$ = 100 V | | | 250 | ns |
| $Q_{RM}$ | | | 1.4 | | µC |
| $I_{RM}$ | | | 8 | | A |

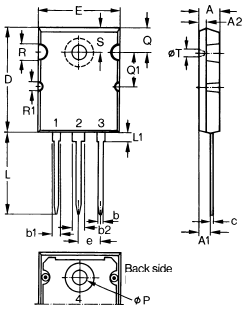
Note: 1. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %

**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 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 |

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4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
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