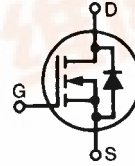




# HiPerFET™ Power MOSFETs

## IXFX 100N25 IXFK 100N25

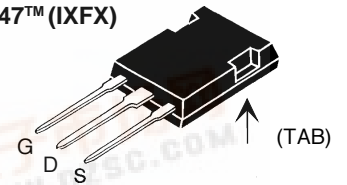
Single MOSFET Die



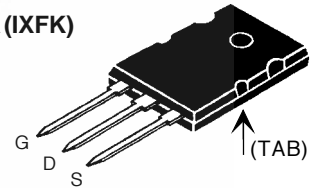
$V_{DSS} = 250 \text{ V}$   
 $I_{D25} = 100 \text{ A}$   
 $R_{DS(on)} = 27 \text{ m}\Omega$   
 $t_{rr} \leq 250 \text{ ns}$

| Symbol     | Test Conditions   | Maximum Ratings |                  |
|------------|---|-----------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$   | 250             | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$  | 250             | V                |
| $V_{GS}$   | Continuous  | $\pm 20$        | V                |
| $V_{GSM}$  | Transient   | $\pm 30$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$ (MOSFET chip capability)   | 100             | A                |
| $I_{D104}$ | $T_C = 104^\circ\text{C}$ (External lead capability)  | 75              | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 400             | A                |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$  | 100             | A                |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$  | 64              | mJ               |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$  | 3               | J                |
| $dv/dt$    | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 5               | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$  | 560             | 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             | $^\circ\text{C}$ |
| $M_d$      | Mounting torque   | TO-264          | 0.9/6 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<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|--------------|---|---|------|---------------------------|
|              |   | min.  | typ. | max.                      |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$           | 250   |      | V                         |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$                | 2.0   |      | 4.0 V                     |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0$              |   |      | $\pm 200 \text{ nA}$      |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $V_{GS} = 0 \text{ V}$             |   |      | 100 $\mu\text{A}$<br>2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Note 1 |   |      | 27 m $\Omega$             |

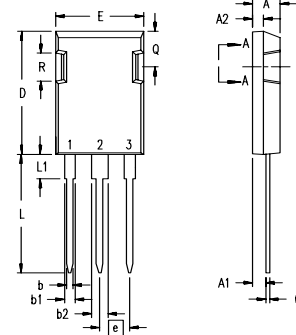


| Symbol                    | Test Conditions  | Characteristic Values                               |      |      |     |
|---------------------------|--|---|------|------|-----|
|                           |  | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |      |     |
|                           |  | min.  | typ. | max. |     |
| <b>g<sub>fs</sub></b>     | V <sub>DS</sub> = 10 V; I <sub>D</sub> = 0.5 I <sub>D25</sub> Note 1   | 40  | 70   |      | S   |
| <b>C<sub>iss</sub></b>    | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz   |   | 9100 |      | pF  |
| <b>C<sub>oss</sub></b>    |  |   | 1800 |      | pF  |
| <b>C<sub>rss</sub></b>    |  |   | 600  |      | pF  |
| <b>t<sub>d(on)</sub></b>  | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = 0.5 I <sub>D25</sub><br>R <sub>G</sub> = 1 Ω (External), |   | 42   |      | ns  |
| <b>t<sub>r</sub></b>      |  |   | 55   |      | ns  |
| <b>t<sub>d(off)</sub></b> |  |   | 110  |      | ns  |
| <b>t<sub>f</sub></b>      |  |   | 40   |      | ns  |
| <b>Q<sub>g(on)</sub></b>  | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = 0.5 I <sub>D25</sub>                                     |   | 300  |      | nC  |
| <b>Q<sub>gs</sub></b>     |  |   | 57   |      | nC  |
| <b>Q<sub>gd</sub></b>     |  |   | 160  |      | nC  |
| <b>R<sub>thJC</sub></b>   |  |   |      | 0.22 | K/W |
| <b>R<sub>thCK</sub></b>   |  | 0.15  |      |      | K/W |

| Symbol                | Test Conditions   | Characteristic Values                               |      |      |    |
|-----------------------|---|---|------|------|----|
|                       |   | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |      |    |
|                       |   | min.  | typ. | max. |    |
| <b>I<sub>s</sub></b>  | V <sub>GS</sub> = 0 V   |   |      | 100  | A  |
| <b>I<sub>SM</sub></b> | Repetitive;<br>pulse width limited by T <sub>JM</sub>           |   |      | 400  | A  |
| <b>V<sub>SD</sub></b> | I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0 V, Note 1 |   |      | 1.5  | V  |
| <b>t<sub>rr</sub></b> | I <sub>F</sub> = 50A, -di/dt = 100 A/μs, V <sub>R</sub> = 100 V |   |      | 250  | ns |
| <b>Q<sub>RM</sub></b> |   |   | 1.4  |      | μC |
| <b>I<sub>RM</sub></b> |   |   | 10   |      | A  |

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

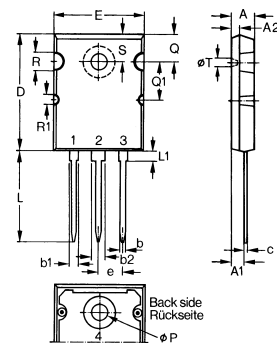
### PLUS 247™ Outline



Terminals: 1 - Gate  
2 - Drain (Collector)  
3 - Source (Emitter)  
4 - Drain (Collector)

| Dim.           | Millimeter |       | Inches   |       |
|----------------|------------|-------|----------|-------|
|                | Min.       | Max.  | Min.     | Max.  |
| A              | 4.83       | 5.21  | .190     | .205  |
| A <sub>1</sub> | 2.29       | 2.54  | .090     | .100  |
| A <sub>2</sub> | 1.91       | 2.16  | .075     | .085  |
| b              | 1.14       | 1.40  | .045     | .055  |
| b <sub>1</sub> | 1.91       | 2.13  | .075     | .084  |
| b <sub>2</sub> | 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  |
| L <sub>1</sub> | 3.81       | 4.32  | .150     | .170  |
| Q              | 5.59       | 6.20  | .220     | 0.244 |
| R              | 4.32       | 4.83  | .170     | .190  |

### TO-264 AA Outline



| Dim.           | Millimeter |       | Inches   |       |
|----------------|------------|-------|----------|-------|
|                | Min.       | Max.  | Min.     | Max.  |
| A              | 4.82       | 5.13  | .190     | .202  |
| A <sub>1</sub> | 2.54       | 2.89  | .100     | .114  |
| A <sub>2</sub> | 2.00       | 2.10  | .079     | .083  |
| b              | 1.12       | 1.42  | .044     | .056  |
| b <sub>1</sub> | 2.39       | 2.69  | .094     | .106  |
| b <sub>2</sub> | 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  |
| L <sub>1</sub> | 2.29       | 2.59  | .090     | .102  |
| P              | 3.17       | 3.66  | .125     | .144  |
| Q              | 6.07       | 6.27  | .239     | .247  |
| Q <sub>1</sub> | 8.38       | 8.69  | .330     | .342  |
| R              | 3.81       | 4.32  | .150     | .170  |
| R <sub>1</sub> | 1.78       | 2.29  | .070     | .090  |
| S              | 6.04       | 6.30  | .238     | .248  |
| T              | 1.57       | 1.83  | .062     | .072  |