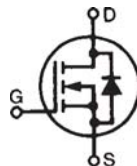


# HiPerFET™ Power MOSFETs

## IXFK33N50 IXFX35N50

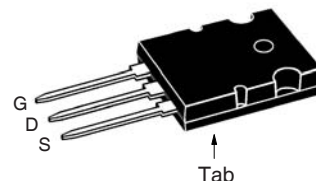
| $V_{DSS}$ | $I_{D25}$ | $R_{DS(on)}$ |
|-----------|-----------|--------------|
| 500V      | 33A       | 160mΩ        |
|           | 35A       | 150mΩ        |

N-Channel Enhancement Mode  
Avalanche Rated  
High dv/dt, Low  $t_{rr}$

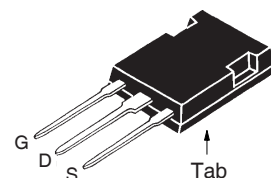


| Symbol     | Test Conditions  | Maximum Ratings        |                  |
|------------|--|------------------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                              | 500                    | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1\text{M}\Omega$ | 500                    | V                |
| $V_{GSS}$  | Continuous   | $\pm 20$               | V                |
| $V_{GSM}$  | Transient  | $\pm 30$               | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$   | 33N50 33<br>35N50 35   | A<br>A           |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$                   | 33N50 132<br>35N50 140 | A<br>A           |
| $I_A$      | $T_C = 25^\circ\text{C}$   | 33                     | A                |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$   | 2.5                    | J                |
| dv/dt      | $I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$     | 5                      | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$   | 416                    | W                |
| $T_J$      |  | -55 ... +150           | $^\circ\text{C}$ |
| $T_{JM}$   |  | 150                    | $^\circ\text{C}$ |
| $T_{stg}$  |  | -55 ... +150           | $^\circ\text{C}$ |
| $T_L$      | Maximum Lead Temperature for Soldering                                       | 300                    | $^\circ\text{C}$ |
| $T_{SOLD}$ | 1.6 mm (0.062in.) from Case for 10s  | 260                    | $^\circ\text{C}$ |
| $M_d$      | Mounting Torque (TO-264)   | 1.13/10                | Nm/lb.in         |
| $F_C$      | Mounting Force (PLUS247)   | 20..120 /4.5..27       | N/lb             |
| Weight     | TO-264   | 10                     | g                |
|            | PLUS247  | 6                      | g                |

TO-264 (IXFK)



PLUS247 (IXFX)



G = Gate      D = Drain  
S = Source    Tab = Drain

### Features

- International Standard Packages
- Avalanche Rated
- Low Intrinsic Gate Resistance
- Low Package Inductance
- Fast Intrinsic Rectifier
- Molding epoxies meet UL 94 V-0 flammability classification
- Low  $R_{DS(on)}$  HDMOS™ process

### Advantages

- High Power Density
- Easy to Mount
- Space Savings

### Applications

- DC-DC Converters
- Battery Chargers
- Synchronous rectification
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- Temperature and Lighting Controls

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)        | Characteristic Values |        |                           |
|--------------|--|-----------------------|--------|---------------------------|
|              |  | Min.                  | Typ.   | Max.                      |
| $BV_{DSS}$   | $V_{GS} = 0\text{V}$ , $I_D = 1\text{mA}$<br>$V_{DSS}$ Temperature Coefficient   | 500                   | 0.102  | V<br>%/K                  |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 4\text{mA}$<br>$V_{GS(th)}$ Temperature Coefficient   | 2.0                   | -0.206 | V<br>%/K                  |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$                                 |                       |        | $\pm 200$ nA              |
| $I_{DSS}$    | $V_{DS} = 0.8 \cdot V_{DSS}$ , $V_{GS} = 0\text{V}$<br>$T_J = 125^\circ\text{C}$ |                       |        | 200 $\mu\text{A}$<br>2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{V}$ , $I_D = 0.5 \cdot I_{DSS}$ , Note 1                       | 33N50<br>35N50        |        | 160 mΩ<br>150 mΩ          |

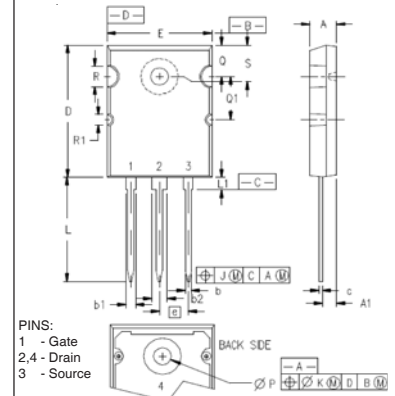
| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)  | Characteristic Values |      |                         |
|--------------|--|-----------------------|------|-------------------------|
|              |  | Min.                  | Typ. | Max.                    |
| $g_{fs}$     | $V_{DS} = 10\text{V}$ , $I_D = 0.5 \cdot I_{DSS}$ , Note 1   | 18                    | 28   | S                       |
| $C_{iss}$    | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$   |                       | 5200 | 5700 nF                 |
| $C_{oss}$    |  |                       | 640  | 750 pF                  |
| $C_{rss}$    |  |                       | 240  | 310 pF                  |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{DSS}$<br>$R_G = 1\Omega$ (External) |                       | 35   | 45 ns                   |
| $t_r$        |  |                       | 42   | 50 ns                   |
| $t_{d(off)}$ |  |                       | 110  | 140 ns                  |
| $t_f$        |  |                       | 23   | 35 ns                   |
| $Q_{g(on)}$  |  |                       | 227  | nC                      |
| $Q_{gs}$     | $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{DSS}$   |                       | 29   | nC                      |
| $Q_{gd}$     |  |                       | 110  | nC                      |
| $R_{thJC}$   |  |                       |      | 0.30 $^\circ\text{C/W}$ |
| $R_{thCS}$   |  | 0.15                  |      | $^\circ\text{C/W}$      |

### Source-Drain Diode

| Symbol   | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)                     | Characteristic Values |      |        |
|----------|---|-----------------------|------|--------|
|          |   | Min.                  | Typ. | Max.   |
| $I_s$    | $V_{GS} = 0\text{V}$  |                       |      | 33 A   |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$   |                       |      | 132 A  |
| $V_{SD}$ | $I_F = I_s$ , $V_{GS} = 0\text{V}$ , Note 1   |                       |      | 1.5 V  |
| $t_{rr}$ | $I_F = I_s$ , $V_{GS} = 0\text{V}$<br>$-di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 100\text{V}$ |                       | 7    | 250 ns |
| $I_{RM}$ |   |                       |      | A      |
| $Q_{RM}$ |   |                       | 750  | nC     |

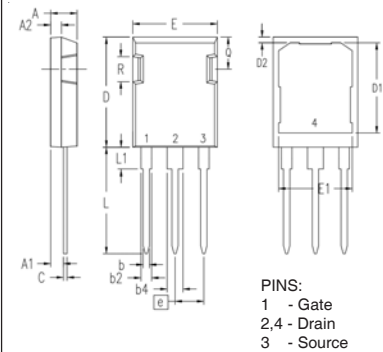
Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

### TO-264 Outline



| SYM | INCHES  |       | MILLIMETERS |       |
|-----|---------|-------|-------------|-------|
|     | MIN     | MAX   | MIN         | MAX   |
| A   | .185    | .209  | 4.70        | 5.31  |
| A1  | .102    | .118  | 2.59        | 3.00  |
| b   | .037    | .055  | 0.94        | 1.40  |
| b1  | .087    | .102  | 2.21        | 2.59  |
| b2  | .110    | .126  | 2.79        | 3.20  |
| c   | .017    | .029  | 0.43        | 0.74  |
| D   | 1.007   | 1.047 | 25.58       | 26.59 |
| E   | .760    | .799  | 19.30       | 20.29 |
| e   | .215BSC |       | 5.46 BSC    |       |
| J   | .000    | .010  | 0.00        | 0.25  |
| K   | .000    | .010  | 0.00        | 0.25  |
| L   | .779    | .842  | 19.79       | 21.39 |
| L1  | .087    | .102  | 2.21        | 2.59  |
| ØP  | .122    | .138  | 3.10        | 3.51  |
| Q   | .240    | .256  | 6.10        | 6.50  |
| Q1  | .330    | .346  | 8.38        | 8.79  |
| ØR  | .155    | .187  | 3.94        | 4.75  |
| ØR1 | .085    | .093  | 2.16        | 2.36  |
| S   | .243    | .253  | 6.17        | 6.43  |

### PLUS247™ Outline



| SYM | INCHES   |      | MILLIMETERS |       |
|-----|----------|------|-------------|-------|
|     | MIN      | MAX  | MIN         | MAX   |
| A   | .190     | .205 | 4.83        | 5.21  |
| A1  | .090     | .100 | 2.29        | 2.54  |
| A2  | .075     | .085 | 1.91        | 2.16  |
| b   | .045     | .055 | 1.14        | 1.40  |
| b2  | .075     | .087 | 1.91        | 2.20  |
| b4  | .115     | .126 | 2.92        | 3.20  |
| C   | .024     | .031 | 0.61        | 0.80  |
| D   | .819     | .840 | 20.80       | 21.34 |
| D1  | .650     | .690 | 16.51       | 17.53 |
| D2  | .035     | .050 | 0.89        | 1.27  |
| E   | .620     | .635 | 15.75       | 16.13 |
| E1  | .545     | .565 | 13.84       | 14.35 |
| e   | .215 BSC |      | 5.45 BSC    |       |
| L   | .780     | .810 | 19.81       | 20.57 |
| L1  | .150     | .170 | 3.81        | 4.32  |
| Q   | .220     | .244 | 5.59        | 6.20  |
| R   | .170     | .190 | 4.32        | 4.83  |



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