

HiPerFET™ Power MOSFETs

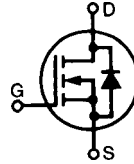
N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low t_{rr}

IXFK33N50
IXFK35N50

| V_{DSS} | I_{D25} | $R_{DS(on)}$ |
|--------------|-------------|---------------------------------|
| 500 V | 33 A | 0.16 Ω |
| 500 V | 35 A | 0.15 Ω |

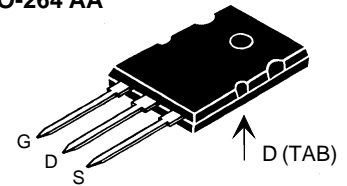
$t_{rr} \leq 250$ ns

Preliminary data



| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|-----------------|------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 500 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω | 500 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 33N50 | 33 A |
| | | 35N50 | 35 A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 33N50 | 132 A |
| | | 35N50 | 140 A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 33N50 | 30 A |
| | | 35N50 | 35 A |
| E_{AS} | $I_D = 32$ A | 2.5 | J |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 45 | mJ |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μs , $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω | 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 | 1.6 mm (0.063 in) from case for 10 s | 300 | $^\circ\text{C}$ |
| M_d | Mounting torque | 0.9/6 | Nm/lb.in. |
| Weight | | 10 | g |

TO-264 AA



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

Features

- International standard packages
- Molding epoxies meet UL 94 V-0 flammability classification
- Low $R_{DS(on)}$ HDMOS™ process
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier

Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

Advantages

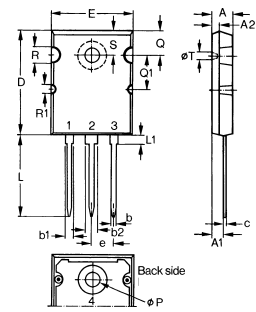
- Easy to mount
- Space savings
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|--------|-------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0$ V, $I_D = 1$ mA V_{DSS} temperature coefficient | 500 | 0.102 | V %/K |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4$ mA $V_{GS(th)}$ temperature coefficient | 2 | -0.206 | V %/K |
| I_{GSS} | $V_{GS} = \pm 20$ V $_{DC}$, $V_{DS} = 0$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0$ V | $T_J = 25^\circ\text{C}$ | | 200 μA |
| | | $T_J = 125^\circ\text{C}$ | | 2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = 16.5$ A Pulse test, $t \leq 300$ μs , duty cycle $d \leq 2$ % | 33N50 | | 0.16 Ω |
| | | 35N50 | | 0.15 Ω |

| Symbol | Test Conditions | Characteristic Values | | | |
|---------------------------|--|---|------|------|-----|
| | | (T _J = 25°C, unless otherwise specified) | | | |
| | | min. | typ. | max. | |
| g_{fs} | V _{DS} = 10 V; I _D = 0.5 • I _{D25} , pulse test | 18 | 28 | | S |
| C_{iss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 5200 | 5700 | pF |
| C_{oss} | | | 640 | 750 | pF |
| C_{rss} | | | 240 | 310 | 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), | | 35 | 45 | ns |
| t_r | | | 42 | 50 | ns |
| t_{d(off)} | | | 110 | 140 | ns |
| t_f | | | 23 | 35 | ns |
| Q_{g(on)} | V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} | | 227 | | nC |
| Q_{gs} | | | 29 | | nC |
| Q_{gd} | | | 110 | | nC |
| R_{thJC} | | | | 0.3 | K/W |
| R_{thCK} | | | 0.15 | | K/W |

Source-Drain Diode

| Symbol | Test Conditions | Characteristic Values | | | |
|-----------------------|--|---|------|------|----|
| | | (T _J = 25°C, unless otherwise specified) | | | |
| | | min. | typ. | max. | |
| I_S | V _{GS} = 0 V | | | 33 | A |
| I_{SM} | Repetitive; pulse width limited by T _{JM} | | | 132 | A |
| V_{SD} | I _F = 100 A, V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | 1.5 | V |
| t_{rr} | I _F = I _S , -di/dt = 100 A/μs, V _R = 100 V | | 0.75 | 250 | ns |
| Q_{RM} | | | 7 | | μC |
| I_{RM} | | | | | |

TO-264 AA Outline


| Dim. | Millimeter | | Inches | |
|------|------------|-------|----------|-------|
| | Min. | Max. | 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 |