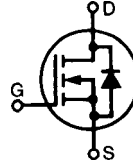


HiPerFET™ Power MOSFETs

IXFH/IXFT 30N50
IXFH/IXFT 32N50

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

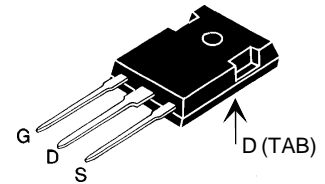


| V_{DSS} | I_{D25} | $R_{DS(on)}$ |
|-----------|-----------|---------------|
| 500 V | 30 A | 0.16 Ω |
| 500 V | 32 A | 0.15 Ω |

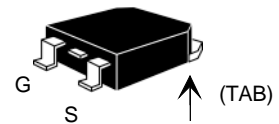
$t_{rr} \leq 250$ ns

| 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 ; $R_{GS} = 1\text{ M}\Omega$ | 500 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 30N50 | 30 A |
| | | 32N50 | 32 A |
| I_{DM} | $T_C = 25^\circ\text{C}$ pulse width limited by T_{JM} | 30N50 | 120 A |
| | | 32N50 | 128 A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 30N50 | 30 A |
| | | 32N50 | 32 A |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.5 | J |
| E_{AR} | $I_D = 25^\circ\text{C}$ | 45 | mJ |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2\ \Omega$ | 5 | V/ns |
| P_D | $T_C = 25^\circ\text{C}$ | 360 | 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 (0.062 in.) from case for 10 s | 300 | $^\circ\text{C}$ |
| M_d | Mounting torque | 1.13/10 | Nm/lb.in. |
| Weight | | 6 | g |

TO-247 AD (IXFH)



TO-268 (D3) Case Style



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 Diode

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls

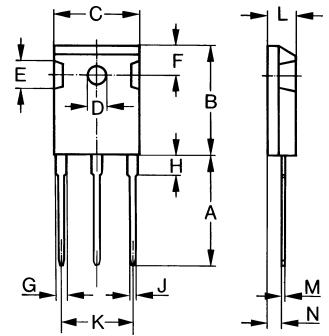
Advantages

- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|--------|---------------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$ | 500 | | V |
| | V_{DSS} temperature coefficient | | 0.102 | %/K |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4\text{ mA}$ | 2 | | V |
| | $V_{GS(th)}$ temperature coefficient | | -0.206 | %/K |
| I_{GSS} | $V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$ | ± 100 | | nA |
| I_{DSS} | $V_{DS} = 0.8 \cdot V_{DSS}$ | 200 | | $T_J = 25^\circ\text{C}$ |
| | $V_{GS} = 0\text{ V}$ | | | $T_J = 125^\circ\text{C}$ |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$, $I_D = 15\text{ A}$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | 32N50 | | 0.15 Ω |
| | | 30N50 | | 0.16 Ω |

| Symbol | Test Conditions | Characteristic Values | | | |
|--------------|---|--|------|------|-----|
| | | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ | | | |
| | | min. | typ. | max. | |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ pulse test | 18 | 28 | | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | 5200 | | 5700 | pF |
| C_{oss} | | 640 | | 750 | pF |
| C_{rss} | | 240 | | 310 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 2\ \Omega$ (External) | | 35 | 45 | ns |
| t_r | | | 42 | 50 | ns |
| $t_{d(off)}$ | | | 110 | 140 | ns |
| t_f | | | 26 | 35 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ | | 227 | 300 | nC |
| Q_{gs} | | | 29 | 40 | nC |
| Q_{gd} | | | 110 | 145 | nC |
| R_{thJC} | (TO-247 Case Style) | | | 0.35 | K/W |
| R_{thCK} | | | 0.25 | | K/W |

TO-247 AD (IXFH) Outline



| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 19.81 | 20.32 | 0.780 | 0.800 |
| B | 20.80 | 21.46 | 0.819 | 0.845 |
| C | 15.75 | 16.26 | 0.610 | 0.640 |
| D | 3.55 | 3.65 | 0.140 | 0.144 |
| E | 4.32 | 5.49 | 0.170 | 0.216 |
| F | 5.4 | 6.2 | 0.212 | 0.244 |
| G | 1.65 | 2.13 | 0.065 | 0.084 |
| H | - | 4.5 | - | 0.177 |
| J | 1.0 | 1.4 | 0.040 | 0.055 |
| K | 10.8 | 11.0 | 0.426 | 0.433 |
| L | 4.7 | 5.3 | 0.185 | 0.209 |
| M | 0.4 | 0.8 | 0.016 | 0.031 |
| N | 1.5 | 2.49 | 0.087 | 0.102 |

| Symbol | Test Conditions | Characteristic Values | | | |
|----------|---|--|------|------------|---------------|
| | | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ | | | |
| | | min. | typ. | max. | |
| I_S | $V_{GS} = 0\text{ V}$ | 30N50 32N50 | | 30 32 | A A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | 30N50 32N50 | | 120 128 | A A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s},$ duty cycle $d \leq 2\%$ | | | 1.5 | V |
| t_{rr} | $I_F = I_S$ $-di/dt = 100\text{ A}/\mu\text{s},$ $V_R = 100\text{ V}$ | $T_J = 25^\circ\text{C}$ | | 250 | ns |
| Q_{RM} | | $T_J = 125^\circ\text{C}$ | | 400 | ns |
| | | $T_J = 25^\circ\text{C}$ | 0.85 | | μC |
| I_{RM} | | $T_J = 25^\circ\text{C}$ | | 8 | A |

| TO-268AA (D ³ PAK) | | Dim. | | Millimeter | | Inches | |
|-------------------------------|----------------|----------|-------|------------|------|-----------|--|
| | | | | Min. Max. | | Min. Max. | |
| | A | 4.9 | 5.1 | .193 | .201 | | |
| | A ₁ | 2.7 | 2.9 | .106 | .114 | | |
| | A ₂ | .02 | .25 | .001 | .010 | | |
| | b | 1.15 | 1.45 | .045 | .057 | | |
| | b ₂ | 1.9 | 2.1 | .75 | .83 | | |
| | C | .4 | .65 | .016 | .026 | | |
| | D | 13.80 | 14.00 | .543 | .551 | | |
| | E | 15.85 | 16.05 | .624 | .632 | | |
| | E ₁ | 13.3 | 13.6 | .524 | .535 | | |
| | e | 5.45 BSC | | | .215 | BSC | |
| H | 18.70 | 19.10 | .736 | .752 | | | |
| L | 2.40 | 2.70 | .094 | .106 | | | |
| L ₁ | 1.20 | 1.40 | .047 | .055 | | | |
| L ₂ | 1.00 | 1.15 | .039 | .045 | | | |
| L ₃ | 0.25 BSC | | | .010 | BSC | | |
| L ₄ | 3.80 | 4.10 | .150 | .161 | | | |

Min. Recommended Footprint

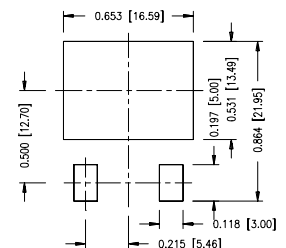


Figure 1. Output Characteristics at 25°C

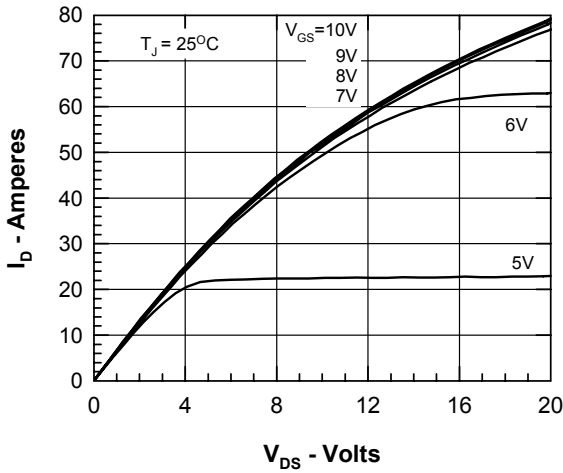


Figure 2. Output Characteristics at 125°C

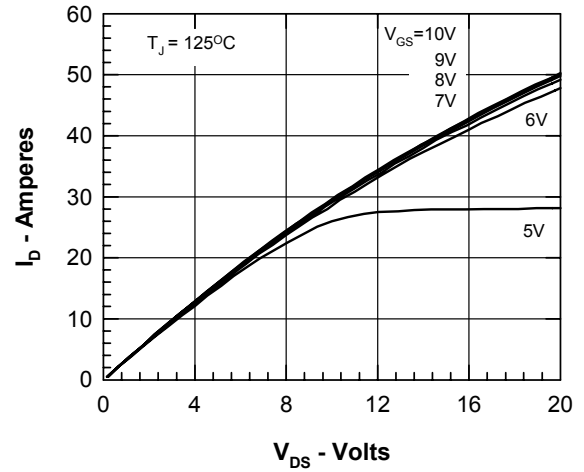


Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

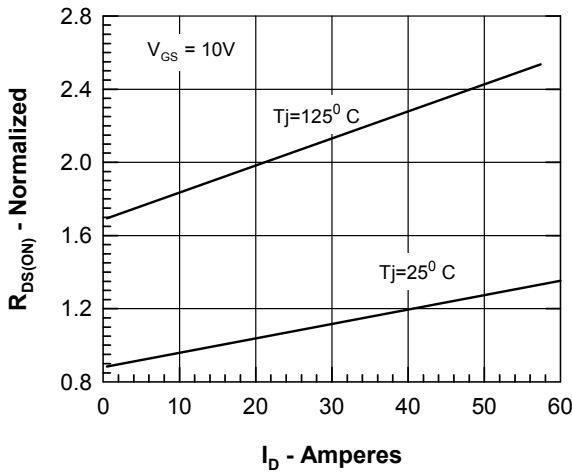


Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

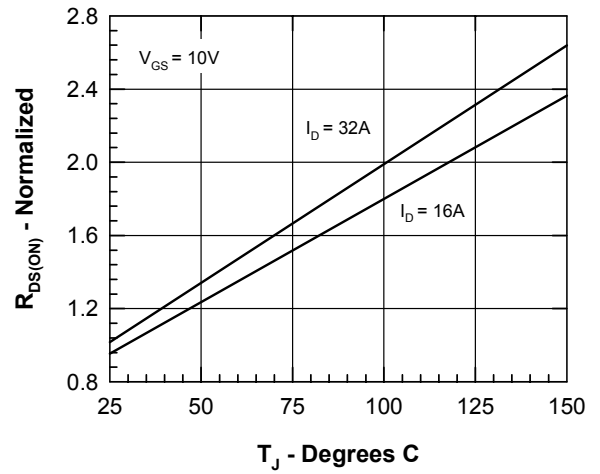


Figure 5. Drain Current vs. Case Temperature

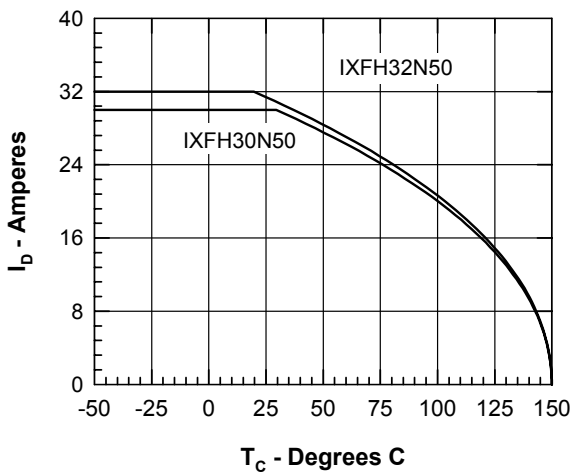


Figure 6. Admittance Curves

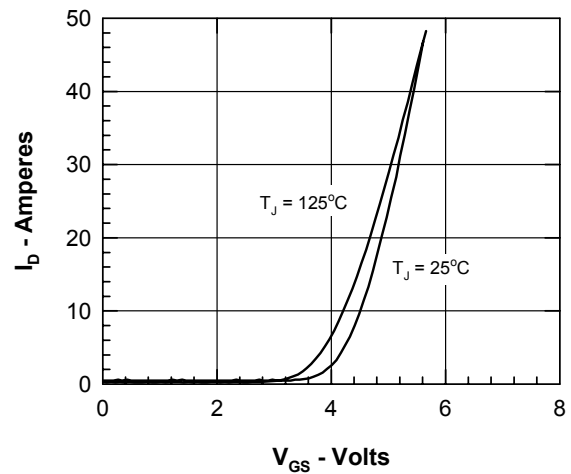


Figure 7. Gate Charge

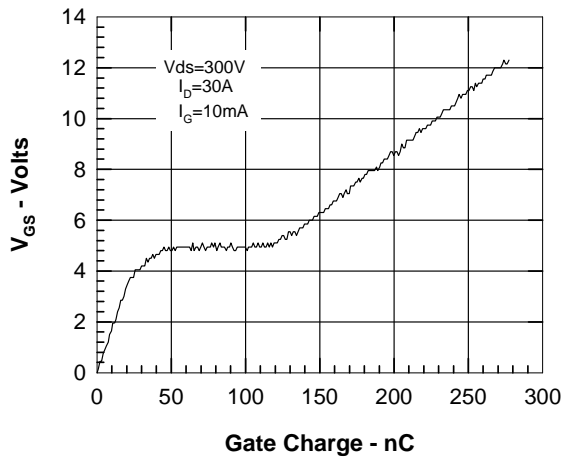


Figure 8. Capacitance Curves

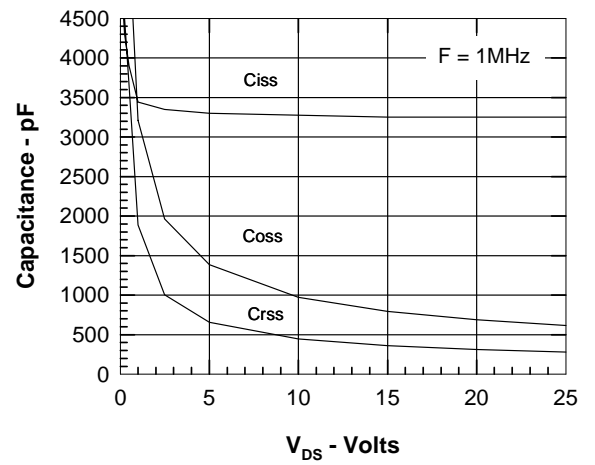


Figure 9. Forward Voltage Drop of the Intrinsic Diode

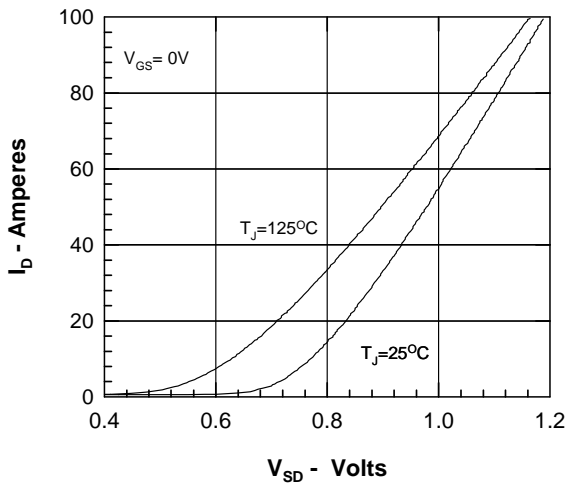


Figure 10. Transient Thermal Resistance

