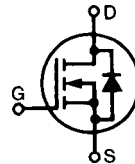


HiPerFET™ Power MOSFETs

~~IXFH/IXFM35N30~~
IXFH40N30
IXFM40N30

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

Obsolete:
IXFM35N30

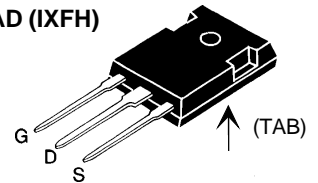


| V _{DSS} | I _{D25} | R _{DS(on)} |
|------------------|------------------|---------------------|
| 300 V | 35 A | 100 mΩ |
| 300 V | 40 A | 85 mΩ |
| 300 V | 40 A | 88 mΩ |

t_{rr} ≤ 200 ns

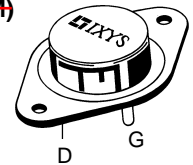
| Symbol | Test Conditions | Maximum Ratings | |
|------------------|---|-----------------------------|--------------|
| V _{DSS} | T _J = 25°C to 150°C | 300 | V |
| V _{DGR} | T _J = 25°C to 150°C; R _{GS} = 1 MΩ | 300 | V |
| V _{GS} | Continuous | ±20 | V |
| V _{GSM} | Transient | ±30 | V |
| I _{D25} | T _C = 25°C | 35N30 40N30 | 35 40 A |
| I _{DM} | T _C = 25°C, pulse width limited by T _{JM} | 35N30 40N30 | 140 160 A |
| I _{AR} | T _C = 25°C | 35N30 40N30 | 35 40 A |
| E _{AR} | T _C = 25°C | 30 | mJ |
| dv/dt | I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 2 Ω | 5 | V/ns |
| P _D | T _C = 25°C | 300 | W |
| T _J | | -55 ... +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 ... +150 | °C |
| T _L | 1.6 mm (0.062 in.) from case for 10 s | 300 | °C |
| M _d | Mounting torque | 1.13/10 | Nm/lb.in. |
| Weight | | TO-204 = 18 g, TO-247 = 6 g | |

TO-247 AD (IXFH)



TO-204 AE (IXFM)

Package unavailable



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
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls
- Low voltage relays

Advantages

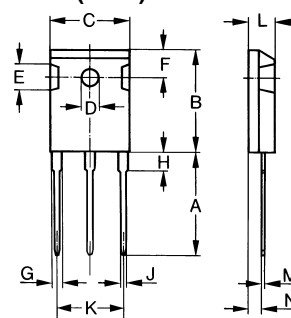
- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

| Symbol | Test Conditions | Characteristic Values (T _J = 25°C, unless otherwise specified) | | |
|---------------------|--|--|------|-------------------------------|
| | | min. | typ. | max. |
| V _{DSS} | V _{GS} = 0 V, I _D = 250 μA | 300 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 4 mA | 2 | | 4 V |
| I _{GSS} | V _{GS} = ±20 V _{DC} , V _{DS} = 0 | | | ±100 nA |
| I _{DSS} | V _{DS} = 0.8 • V _{DSS} , V _{GS} = 0 V | | | 200 μA 1 mA |
| R _{DS(on)} | V _{GS} = 10 V, I _D = 0.5 I _{D25} | | | 0.100 Ω 0.085 Ω 0.088 Ω |
| | Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | |

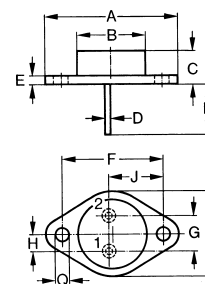
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | | |
|--------------|---|---|------|------|-----|
| | | min. | typ. | max. | |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$, pulse test | 22 | 25 | S | |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 4800 | pF | |
| C_{oss} | | | 745 | pF | |
| C_{rss} | | | 280 | pF | |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 2\ \Omega$ (External) | | 20 | 30 | ns |
| t_r | | | 60 | 90 | ns |
| $t_{d(off)}$ | | | 75 | 100 | ns |
| t_f | | | 45 | 90 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$ | | 177 | 200 | nC |
| Q_{gs} | | | 28 | 50 | nC |
| Q_{gd} | | | 78 | 105 | nC |
| R_{thJC} | | | | 0.42 | K/W |
| R_{thCK} | | | 0.25 | | K/W |

Source-Drain Diode
Characteristic Values
($T_J = 25^\circ\text{C}$, unless otherwise specified)

| Symbol | Test Conditions | Characteristic Values | | | |
|----------|---|---|------|------------|----------|
| | | min. | typ. | max. | |
| I_S | $V_{GS} = 0\text{ V}$ | 35N30 40N30 | | 35 40 | A A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | 35N30 40N30 | | 140 160 | 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} | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$ | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ | | 200 350 | ns ns |

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 |

TO-204 AE (IXFM) Outline


| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 38.61 | 39.12 | 1.520 | 1.540 |
| B | - | 22.22 | - | 0.875 |
| C | 6.40 | 11.40 | 0.252 | 0.449 |
| D | 1.45 | 1.60 | 0.057 | 0.063 |
| E | 1.52 | 3.43 | 0.060 | 0.135 |
| F | 30.15 | BSC | 1.187 | BSC |
| G | 10.67 | 11.17 | 0.420 | 0.440 |
| H | 5.21 | 5.71 | 0.205 | 0.225 |
| J | 16.64 | 17.14 | 0.655 | 0.675 |
| K | 11.18 | 12.19 | 0.440 | 0.480 |
| Q | 3.84 | 4.19 | 0.151 | 0.165 |
| R | 25.16 | 26.66 | 0.991 | 1.050 |

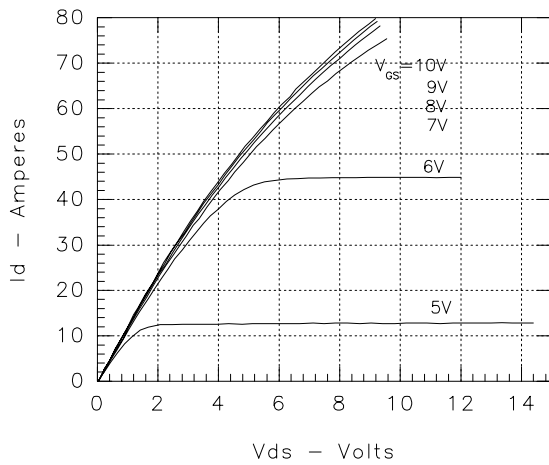
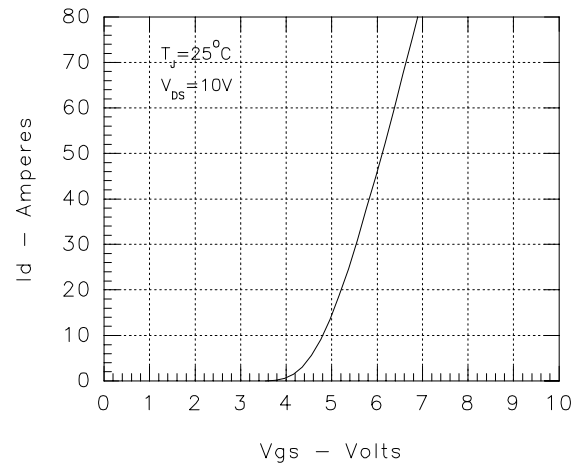
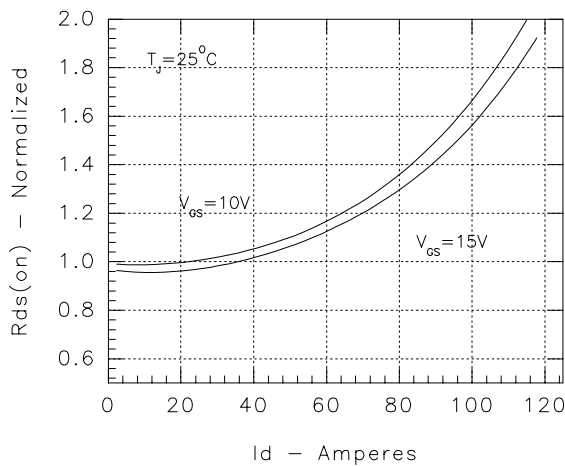
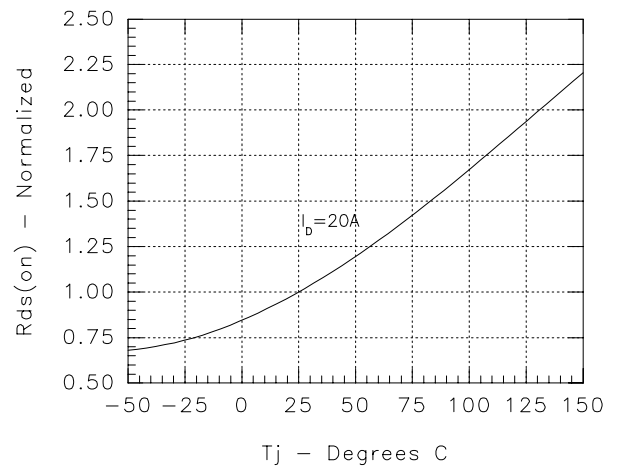
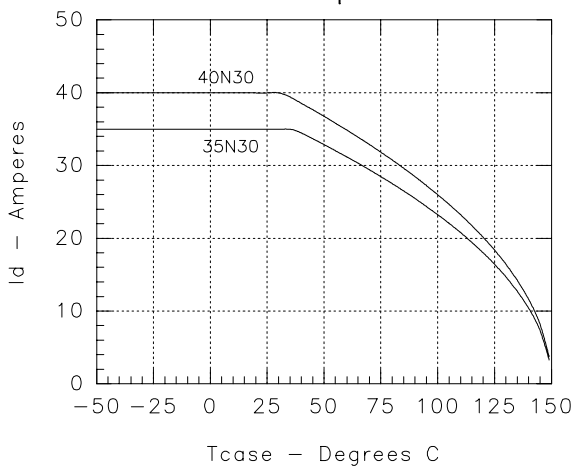
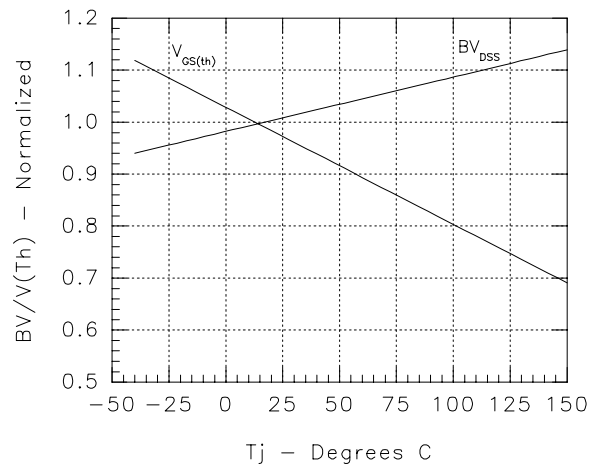
Fig.1. Output Characteristics

Fig. 2. Input Admittance

Fig. 3. Rds(on) vs. Drain Current

Fig. 4. Temperature Dependence of Drain to Source Resistance

Fig. 5. Drain Current vs. Case Temperature

Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage


Fig.7 Gate Charge Characteristic Curve

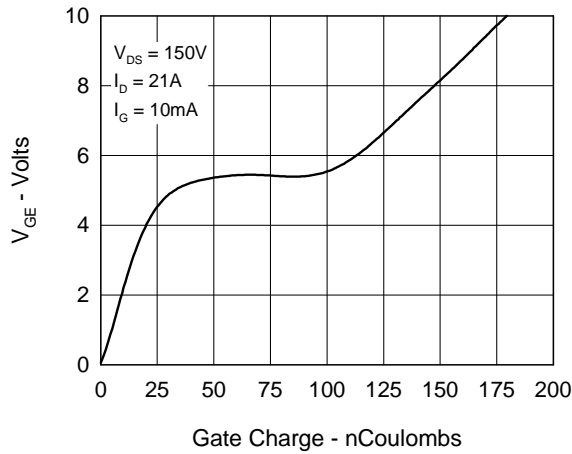


Fig.8 Forward Bias Safe Operating Area

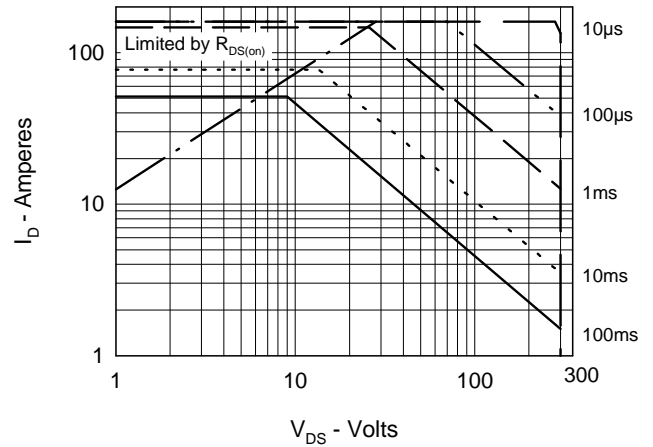


Fig.9 Capacitance Curves

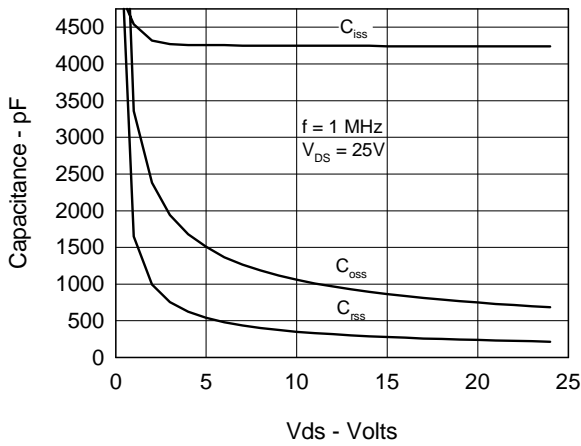


Fig.10 Source Current vs. Source

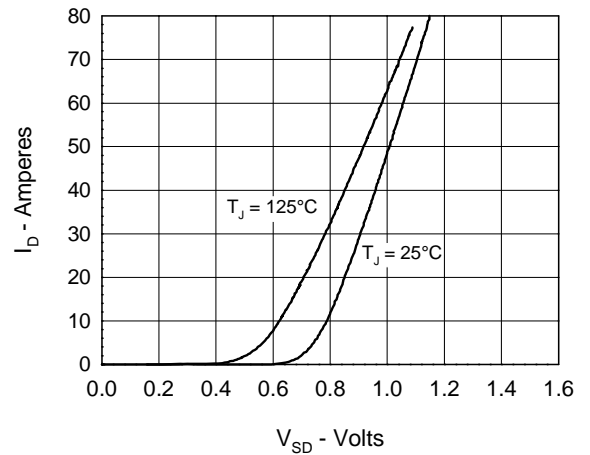
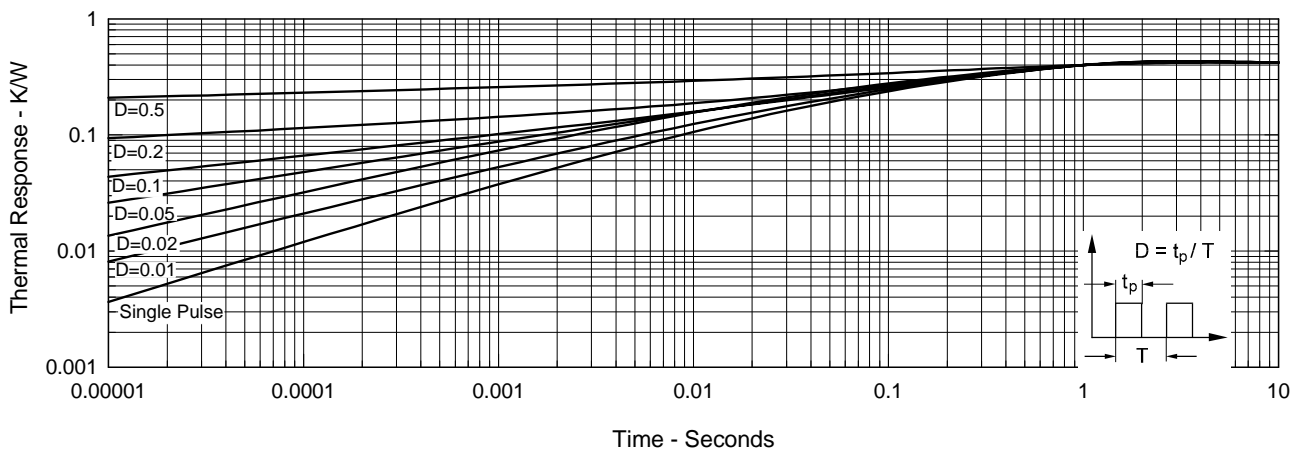


Fig.11 Transient Thermal Impedance





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