

HiPerFET™ Power MOSFETs

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

Obsolete:
IXFM10N90
IXFM12N90

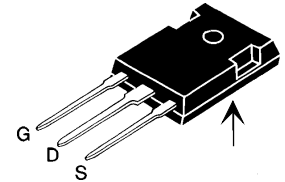
~~IXFH/IXFM 10 N90~~
~~IXFH/IXFM 12 N90~~
IXFH/IXFT 13 N90



| V _{DSS} | I _{D25} | R _{DS(on)} |
|------------------|------------------|---------------------|
| 900 V | 10 A | 1.1 Ω |
| 900 V | 12 A | 0.9 Ω |
| 900 V | 13 A | 0.8 Ω |

t_{rr} ≤ 250 ns

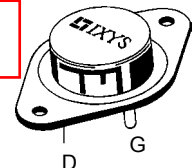
TO-247 AD (IXFH)



(TAB)

~~TO-204 AA (IXFM)~~

**Package
unavailable**



TO-268 (IXFT)



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

| Symbol | Test Conditions | Maximum Ratings | |
|------------------|---|----------------------------------|-----------|
| V _{DSS} | T _J = 25°C to 150°C | 900 | V |
| V _{DGR} | T _J = 25°C to 150°C; R _{GS} = 1 MΩ | 900 | V |
| V _{GS} | Continuous | ±20 | V |
| V _{GSM} | Transient | ±30 | V |
| I _{D25} | T _C = 25°C | 10N90 10 12N90 12 13N90 13 | A |
| I _{DM} | T _C = 25°C, pulse width limited by T _{JM} | 10N90 40 12N90 48 13N90 52 | A |
| I _{AR} | T _C = 25°C | 10N90 10 12N90 12 13N90 13 | 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 | |

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 = 3 mA | 900 | | V |
| V _{GS(th)} | V _{DS} = V _{DSS} , I _D = 4 mA | 2.0 | | 4.5 V |
| I _{GSS} | V _{GS} = ±20 V _{DC} , V _{DS} = 0 | | | ±100 nA |
| I _{DSS} | V _{DS} = V _{DSS} , V _{GS} = 0 V | | | 25 μA 1 mA |
| R _{DS(on)} | V _{GS} = 10 V, I _D = 0.5 • I _{D25} | 10N90 12N90 13N90 | | 1.1 Ω 0.9 Ω 0.8 Ω |
| | Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | |

Fig. 1. Output Characteristics

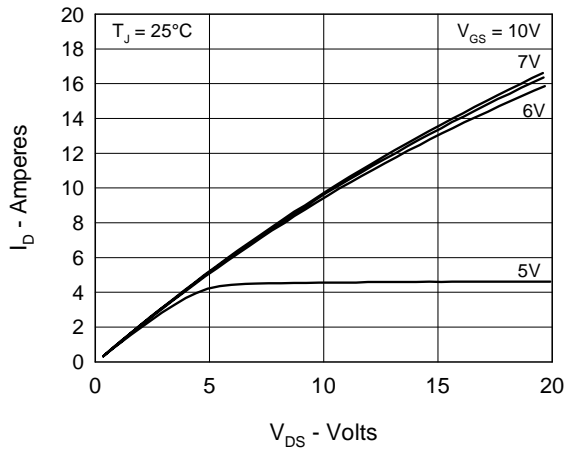


Fig. 2. Input Admittance

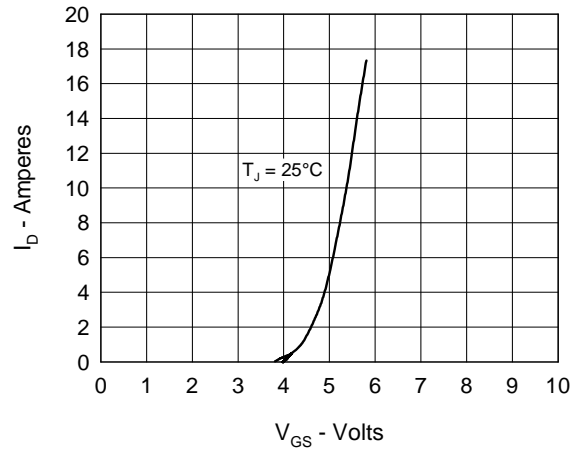


Fig. 3. $R_{DS(on)}$ vs. Drain Current

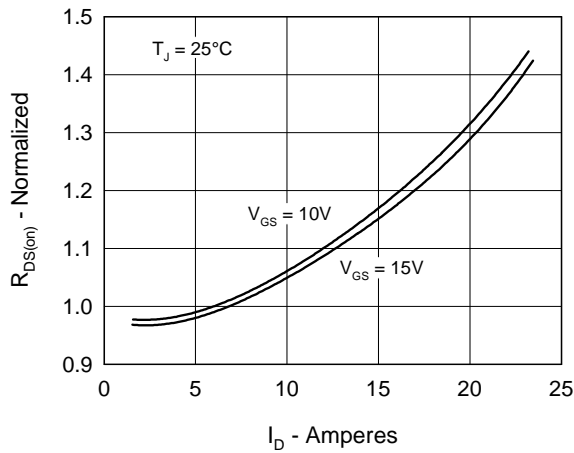


Fig. 4. Temperature Dependence of Drain to Source Resistance

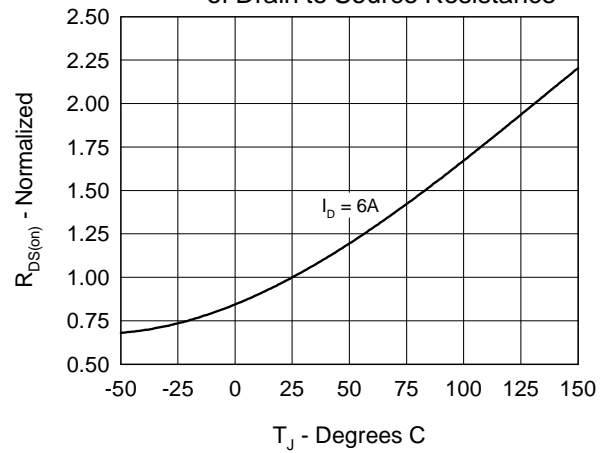


Fig. 5. Drain Current vs. Case Temperature

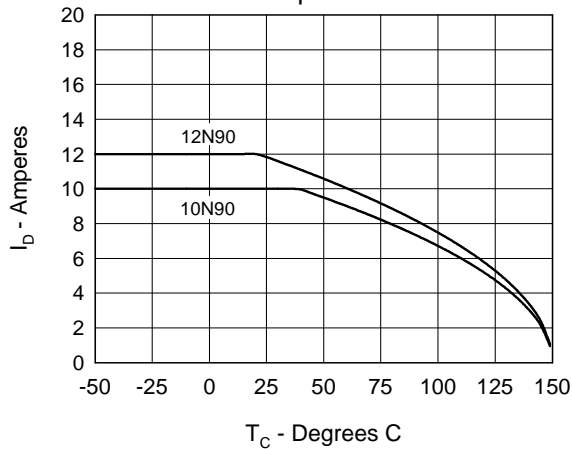


Fig. 6. Temperature Dependence of Breakdown and Threshold Voltage

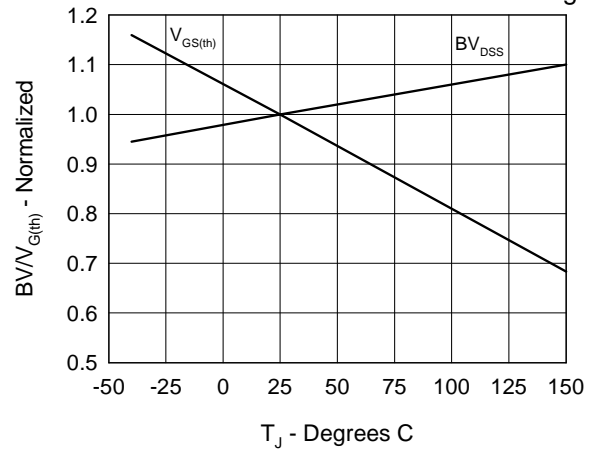


Fig.7. Gate Charge Characteristic Curve

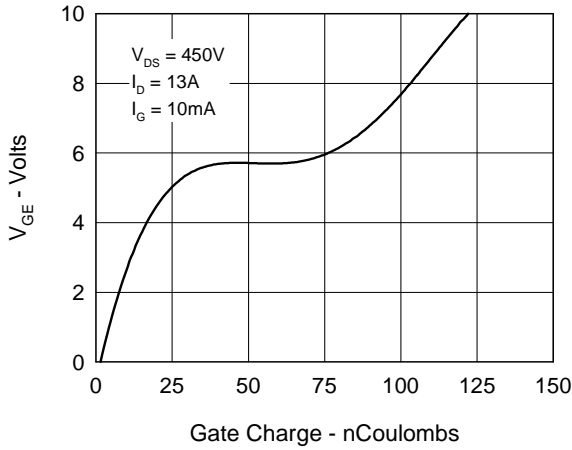


Fig.8. Capacitance Curves

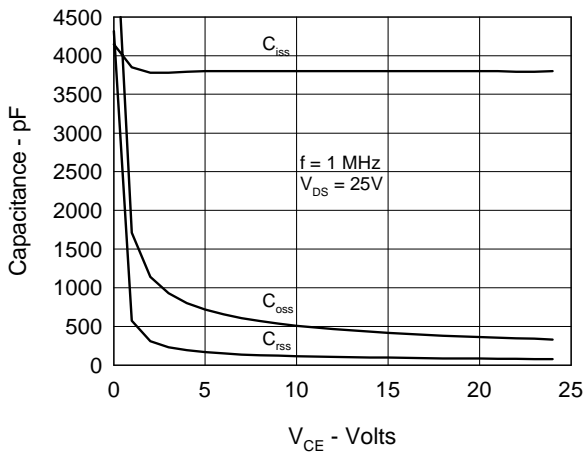


Fig.9. Source Current vs. Source to Drain Voltage

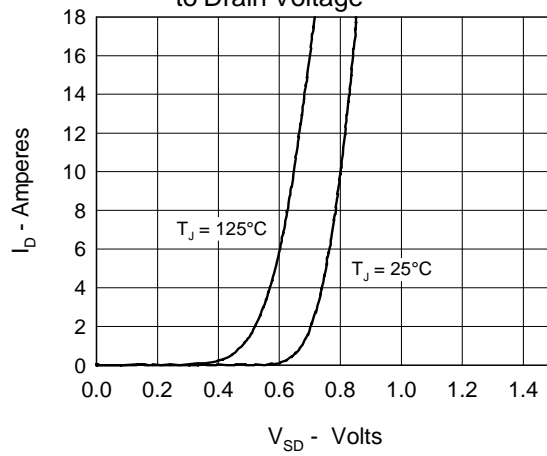
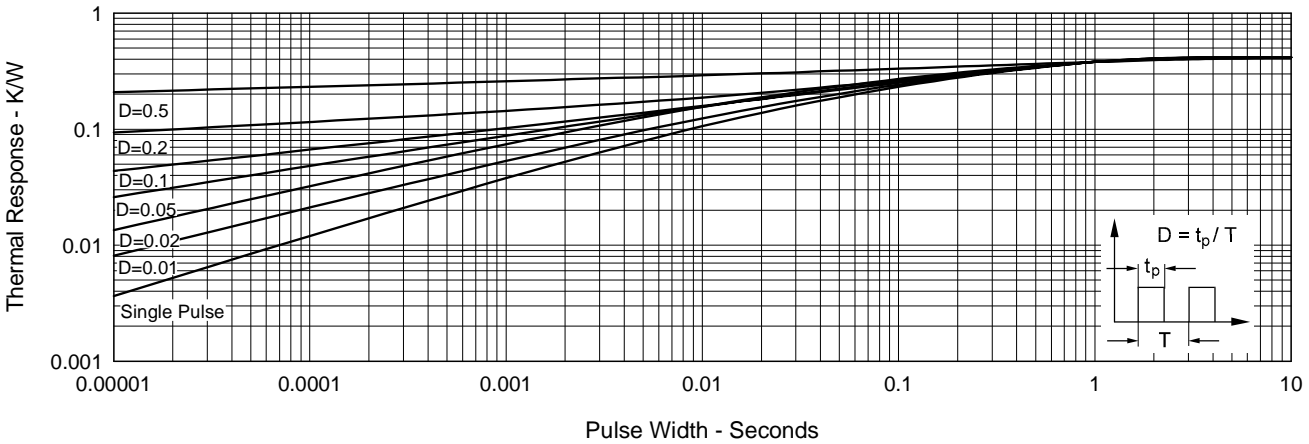


Fig.10. Transient Thermal Impedance



IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

| | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| 4,835,592 | 4,881,106 | 5,017,508 | 5,049,961 | 5,187,117 | 5,486,715 | 6,306,728B1 |
| 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 | |



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