

HiPerFET™

Power MOSFETs

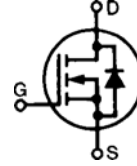
Q-Class

N-Channel Enhancement Mode
Avalanche Rated, Low Q_g , High dv/dt

IXFH/IXFT 24N50Q
IXFH/IXFT 26N50Q

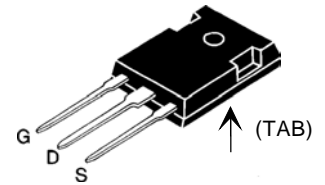
| V_{DSS} | I_{D25} | $R_{DS(on)}$ |
|-----------|-----------|---------------|
| 500 V | 24 A | 0.23 Ω |
| 500 V | 26 A | 0.20 Ω |

$t_{rr} \leq 250$ ns

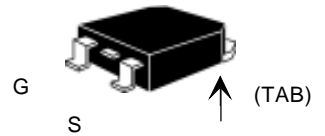


| Symbol | Test Conditions | Maximum Ratings | |
|-----------|---|-----------------|------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 500 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω | 500 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 24N50Q | 24 A |
| | | 26N50Q | 26 A |
| I_{DM} | $T_C = 25^\circ\text{C}$, Note 1 | 24N50Q | 96 A |
| | | 26N50Q | 104 A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 24N50Q | 24 A |
| | | 26N50Q | 26 A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 30 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.5 | J |
| 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 | $T_C = 25^\circ\text{C}$ | 300 | 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 | 1.13/10 | Nm/lb.in. |
| Weight | TO-247 | 6 | g |
| | TO-268 | 4 | g |

TO-247 AD (IXFH)



TO-268 (D3) (IXFT) Case Style



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

Features

- IXYS advanced low Q_g process
- International standard packages
- Low $R_{DS(on)}$
- Unclamped Inductive Switching (UIS) rated
- Fast switching
- Molding epoxies meet UL 94 V-0 flammability classification

Advantages

- Easy to mount
- Space savings
- High power density

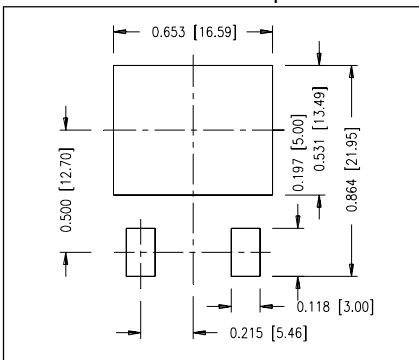
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0$ V, $I_D = 250$ μA | 500 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4$ mA | 2.5 | | 4.5 V |
| I_{GSS} | $V_{GS} = \pm 20$ V $_{DC}$, $V_{DS} = 0$ | | | ± 100 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0$ V | $T_J = 25^\circ\text{C}$ | | 25 μA |
| | | $T_J = 125^\circ\text{C}$ | | 1 mA |
| $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = 0.5$ I_{D25} Note 2 | 24N50Q | | 0.23 Ω |
| | | 26N50Q | | 0.20 Ω |

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|--|------|---------|
| | | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ | | |
| | | min. | typ. | max. |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, Note 2 | 14 | 24 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 3900 | pF |
| C_{oss} | | | 500 | pF |
| C_{rss} | | | 130 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 2\ \Omega$ (External), | | 28 | ns |
| t_r | | | 30 | ns |
| $t_{d(off)}$ | | | 55 | ns |
| t_f | | | 16 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 95 | nC |
| Q_{gs} | | | 27 | nC |
| Q_{gd} | | | 40 | nC |
| R_{thJC} | (TO-247) | | | 0.42 KW |
| R_{thCK} | | | 0.25 | KW |

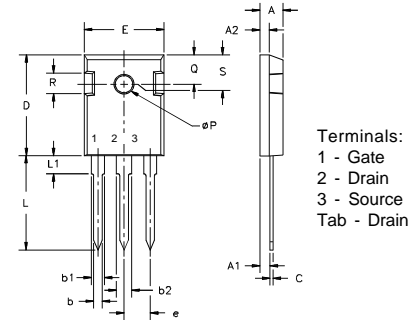
| Source-Drain Diode | | Characteristic Values | | |
|--------------------|--|--|------|---------------|
| | | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ | | |
| Symbol | Test Conditions | min. | typ. | max. |
| I_S | $V_{GS} = 0\text{ V}$ | 24N50Q 26N50Q | | 24 26 A |
| I_{SM} | Repetitive; Note 1 | 24N50Q 26N50Q | | 96 104 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 1.3 V |
| t_{rr} | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | 0.85 | 250 ns |
| Q_{RM} | | | | μC |
| I_{RM} | | | 8 | A |

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

Min Recommended Footprint



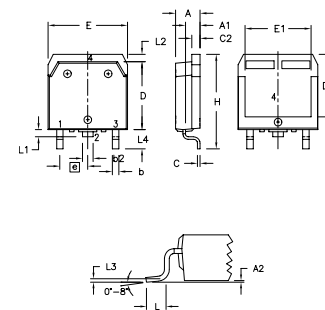
TO-247 AD Outline



Terminals:
 1 - Gate
 2 - Drain
 3 - Source
 Tab - Drain

| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.7 | 5.3 | .185 | .209 |
| A ₁ | 2.2 | 2.54 | .087 | .102 |
| A ₂ | 2.2 | 2.6 | .059 | .098 |
| b | 1.0 | 1.4 | .040 | .055 |
| b ₁ | 1.65 | 2.13 | .065 | .084 |
| b ₂ | 2.87 | 3.12 | .113 | .123 |
| C | .4 | .8 | .016 | .031 |
| D | 20.80 | 21.46 | .819 | .845 |
| E | 15.75 | 16.26 | .610 | .640 |
| e | 5.20 | 5.72 | 0.205 | 0.225 |
| L | 19.81 | 20.32 | .780 | .800 |
| L1 | | 4.50 | | .177 |
| ØP | 3.55 | 3.65 | .140 | .144 |
| Q | 5.89 | 6.40 | 0.232 | 0.252 |
| R | 4.32 | 5.49 | .170 | .216 |
| S | 6.15 | BSC | 242 | BSC |

TO-268 Outline



| 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 ₁ | 1.9 | 2.1 | .075 | .083 |
| b ₂ | .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 |
| L1 | 1.20 | 1.40 | .047 | .055 |
| L2 | 1.00 | 1.15 | .039 | .045 |
| L3 | 0.25 | BSC | .010 | BSC |
| L4 | 3.80 | 4.10 | .150 | .161 |

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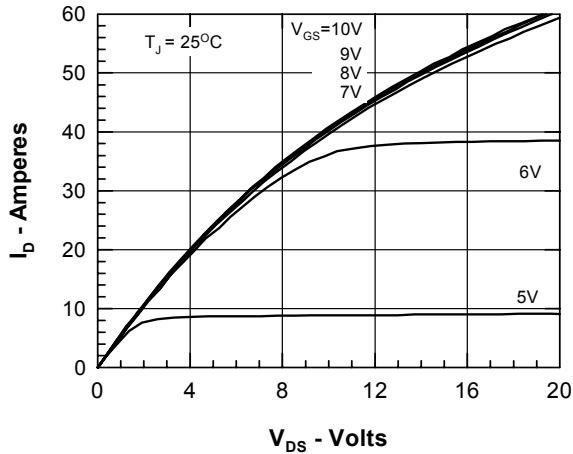


Fig.1 Output Characteristics @ $T_J = 25^\circ\text{C}$

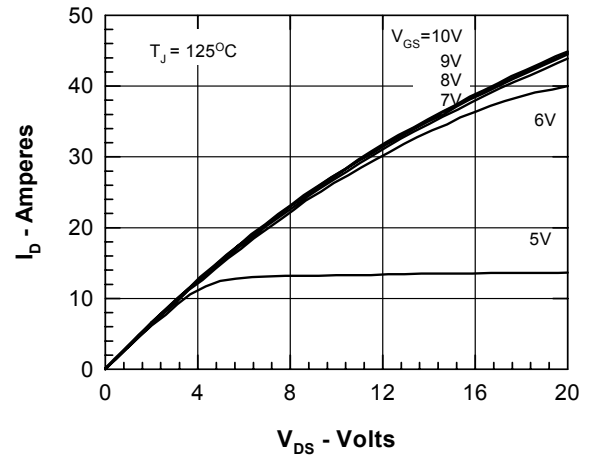


Fig.2 Output Characteristics @ $T_J = 125^\circ\text{C}$

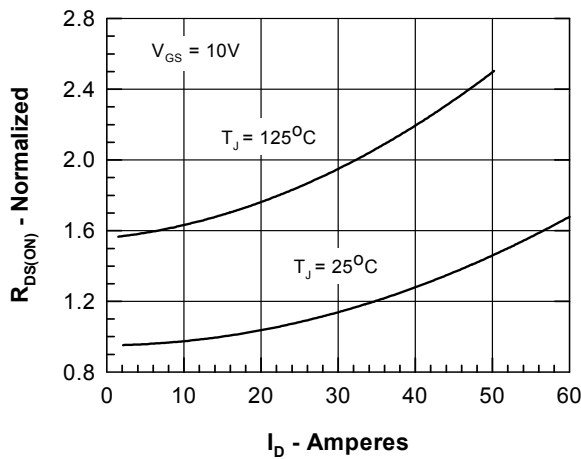


Fig.3 $R_{DS(on)}$ vs. Drain Current

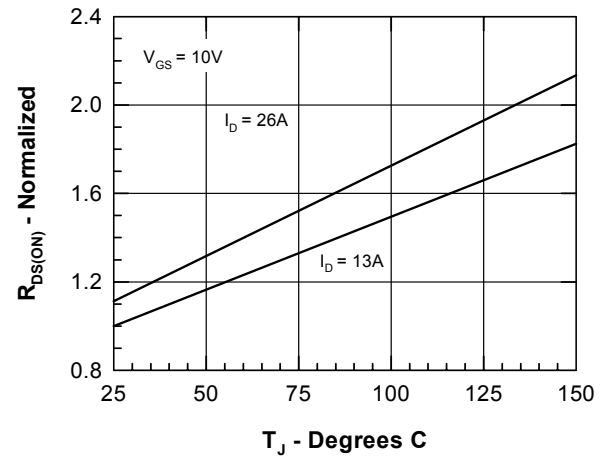


Fig.4 Temperature Dependence of Drain to Source Resistance

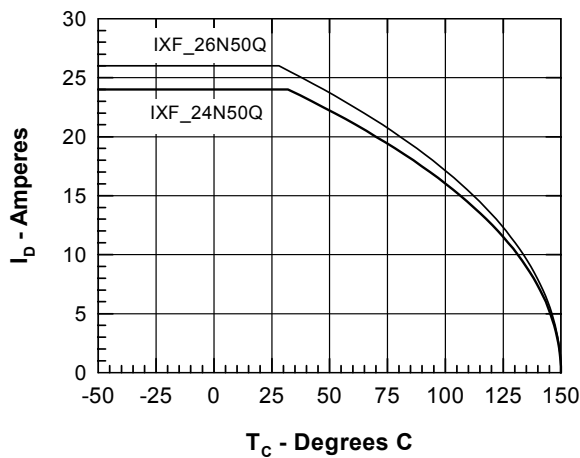


Fig.5 Drain Current vs. Case Temperature

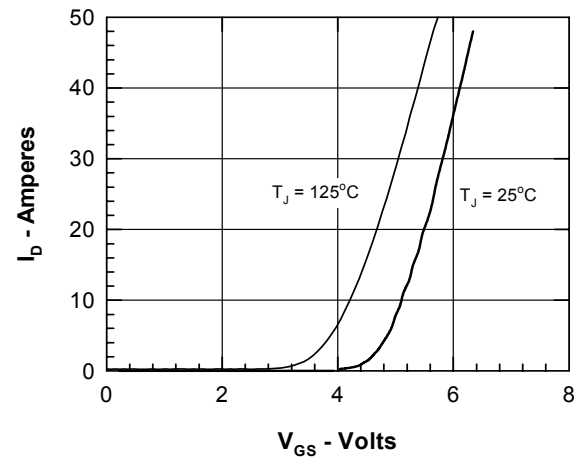


Fig.6 Drain Current vs. Gate Source Voltage

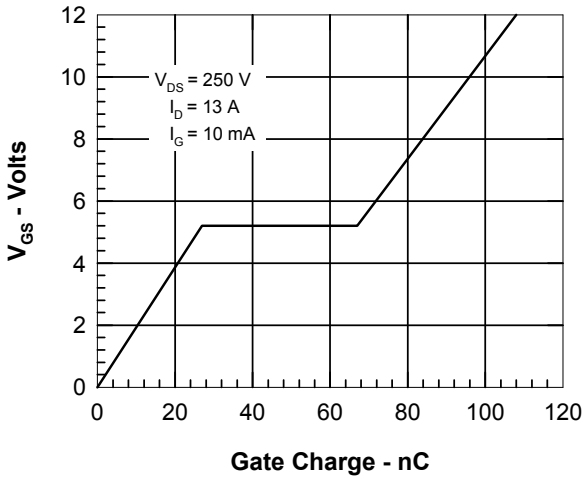


Fig.7 Gate Charge Characteristic Curve

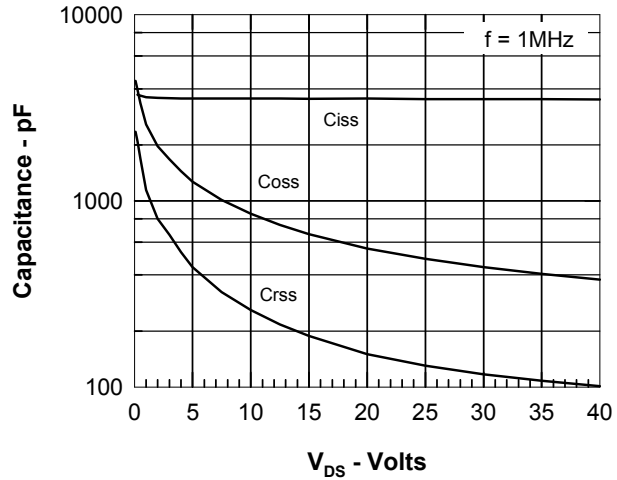


Fig.8 Capacitance Curves

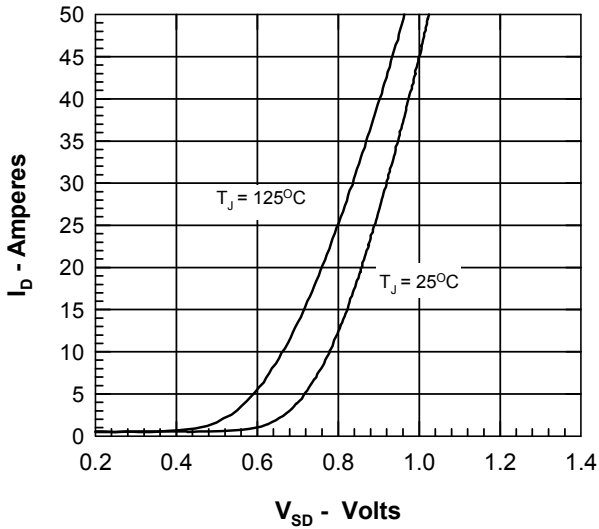


Fig.9 Drain Current vs Drain to Source Voltage

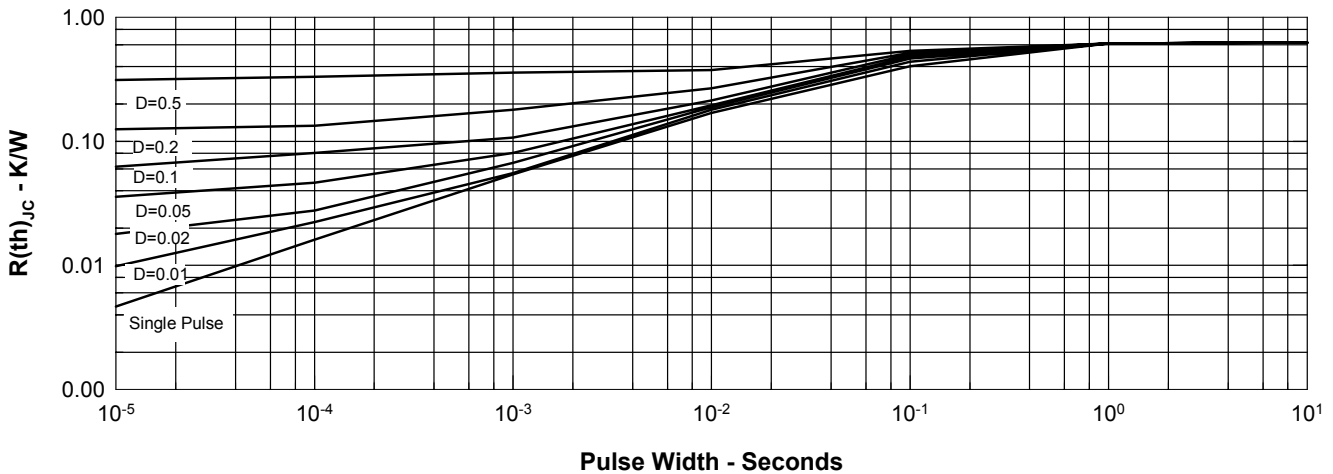


Fig.10 Transient Thermal Impedance

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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