

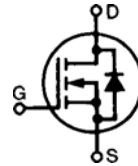
HiPerFET™ Power MOSFETs Q-Class

IXFH 40N50Q
IXFT 40N50Q

V_{DSS} = 500 V
I_{D25} = 40 A
R_{DS(on)} = 0.14 Ω

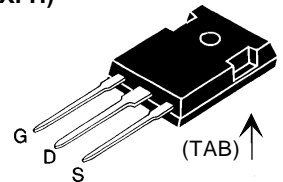
t_{rr} ≤ 250 ns

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

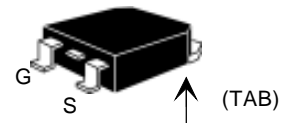


| Symbol | Test Conditions | Maximum Ratings | |
|------------------|---|-----------------|-----------|
| V _{DSS} | T _J = 25°C to 150°C | 500 | V |
| V _{DGR} | T _J = 25°C to 150°C; R _{GS} = 1 MΩ | 500 | V |
| V _{GS} | Continuous | ±30 | V |
| V _{GSM} | Transient | ±40 | V |
| I _{D25} | T _C = 25°C | 40 | A |
| I _{DM} | T _C = 25°C, pulse width limited by T _{JM} | 160 | A |
| I _{AR} | T _C = 25°C | 40 | A |
| E _{AR} | T _C = 25°C | 50 | mJ |
| E _{AS} | | 2.5 | mJ |
| dv/dt | I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 2 Ω | 20 | V/ns |
| P _D | T _C = 25°C | 500 | W |
| T _J | | -55 to +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 to +150 | °C |
| T _L | 1.6 mm (0.063 in) from case for 10 s | 300 | °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)



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

| 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 | 500 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 4 mA | 2.5 | | V |
| I _{GSS} | V _{GS} = ±30 V _{DC} , V _{DS} = 0 | | | ±100 nA |
| I _{DSS} | V _{DS} = V _{DSS} V _{GS} = 0 V | T _J = 25°C | | 25 μA |
| | | T _J = 125°C | | 1 mA |
| R _{DS(on)} | V _{GS} = 10 V, I _D = 0.5 I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | 0.14 Ω |

Features

- IXYS advanced low Q_g process
- Low gate charge and capacitances
 - easier to drive
 - faster switching
- International standard packages
- Low R_{DS(on)}
- Rated for unclamped Inductive load switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

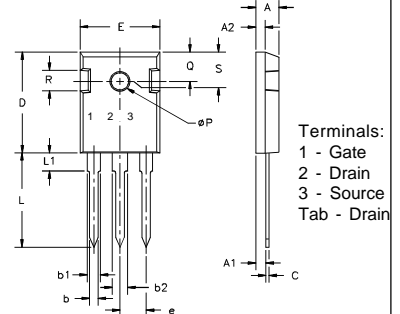
Advantages

- 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. |
| g_{fs} | $V_{DS} = 20\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test | 22 | 35 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 3800 | pF |
| C_{oss} | | | 660 | pF |
| C_{rss} | | | 180 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 2.0\ \Omega$ (External), | | 17 | ns |
| t_r | | | 20 | ns |
| $t_{d(off)}$ | | | 56 | ns |
| t_f | | | 14 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 130 | nC |
| Q_{gs} | | | 26 | nC |
| Q_{gd} | | | 58 | nC |
| R_{thJC} | (TO-247) | | | 0.25 K/W |
| R_{thCK} | | | 0.25 | K/W |

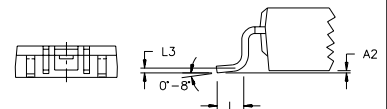
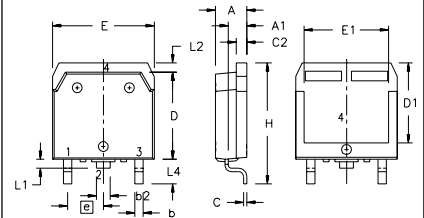
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|----------|---|---|------|---------------|
| | | min. | typ. | max. |
| I_S | $V_{GS} = 0\text{ V}$ | | 40 | A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | 160 | A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | 1.5 | V |
| t_{rr} | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | 1.0 | ns |
| Q_{RM} | | | 10 | μC |
| I_{RM} | | | | A |

TO-247 AD (IXFH) Outline



| 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 |
| L ₁ | | 4.50 | | .177 |
| $\varnothing P$ | 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



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

| SYM | INCHES | | MILLIMETERS | |
|----------------|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .193 | .201 | 4.90 | 5.10 |
| A ₁ | .106 | .114 | 2.70 | 2.90 |
| A ₂ | .001 | .010 | 0.02 | 0.25 |
| b | .045 | .057 | 1.15 | 1.45 |
| b ₂ | .075 | .083 | 1.90 | 2.10 |
| C | .016 | .026 | 0.40 | 0.65 |
| C ₂ | .057 | .063 | 1.45 | 1.60 |
| D | .543 | .551 | 13.80 | 14.00 |
| D ₁ | .488 | .500 | 12.40 | 12.70 |
| E | .624 | .632 | 15.85 | 16.05 |
| E ₁ | .524 | .535 | 13.30 | 13.60 |
| e | .215 BSC | | 5.45 BSC | |
| H | .736 | .752 | 18.70 | 19.10 |
| L | .094 | .106 | 2.40 | 2.70 |
| L ₁ | .047 | .055 | 1.20 | 1.40 |
| L ₂ | .039 | .045 | 1.00 | 1.15 |
| L ₃ | .010 BSC | | 0.25 BSC | |
| L ₄ | .150 | .161 | 3.80 | 4.10 |

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