



**THE DATASHEET OF
IXFH20N80Q**



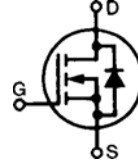
HiPerFET™ Power MOSFETs Q-Class

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

IXFH20N80Q
IXFK20N80Q
IXFT20N80Q

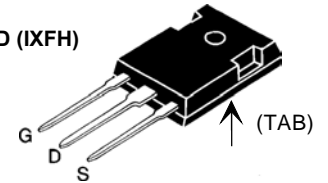
$V_{DSS} = 800 \text{ V}$
 $I_{D25} = 20 \text{ A}$
 $R_{DS(on)} = 0.42 \text{ } \Omega$

$t_{rr} \leq 250 \text{ ns}$

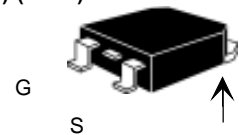


| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|----------------------------|--------------------------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 800 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$ | 800 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 20 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 80 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 20 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 45 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.5 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2 \text{ } \Omega$ | 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 (0.063 in) from case for 10 s | 300 | $^\circ\text{C}$ |
| M_d | Mounting torque | TO-247 TO-264 | 1.13/10 Nm/lb.in. 0.9/6 Nm/lb.in. |
| Weight | | TO-247 TO-268 TO-264 | 6 4 10 g |

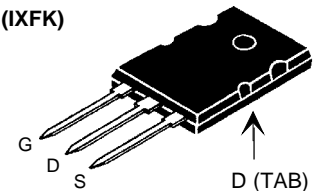
TO-247 AD (IXFH)



TO-268 (D3) (IXFT)



TO-264 AA (IXFK)



G = Gate
S = Source

TAB = Drain

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|--------------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0 \text{ V}$, $I_D = 250 \text{ } \mu\text{A}$ | 800 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$ | 2.5 | | V |
| I_{GSS} | $V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$ | | | $\pm 200 \text{ nA}$ |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0 \text{ V}$ | | | 25 μA 1 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \text{ } \mu\text{s}$, duty cycle $d \leq 2 \%$ | | | 0.42 Ω |

Features

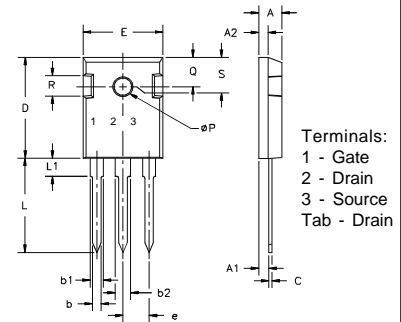
- IXYS advanced low Q_g process
- International standard packages
- Epoxy meet UL 94 V-0, flammability classification
- Low $R_{DS(on)}$ low Q_g
- Avalanche energy and current rated
- Fast intrinsic rectifier

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} | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test | 11 | 19 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 5100 | pF |
| C_{oss} | | | 500 | pF |
| C_{rss} | | | 170 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1.5\ \Omega$ (External), | | 28 | ns |
| t_r | | | 27 | ns |
| $t_{d(off)}$ | | | 74 | ns |
| t_f | | | 14 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 150 | nC |
| Q_{gs} | | | 34 | nC |
| Q_{gd} | | | 80 | nC |
| R_{thJC} | | | 0.35 | K/W |
| R_{thCK} | TO-247 | | 0.25 | K/W |
| | TO-264 | | 0.15 | K/W |

TO-247 AD (IXFH) Outline



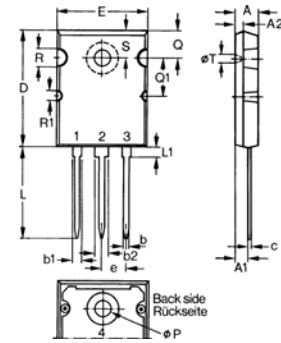
| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.7 | 5.3 | .185 | .209 |
| A ₁ | 2.2 | 2.54 | .087 | .102 |
| A ₂ | 2.2 | 2.6 | .059 | .098 |
| b | 1.0 | 1.4 | .040 | .055 |
| b ₁ | 1.65 | 2.13 | .065 | .084 |
| b ₂ | 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 |
| ∅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 |

Source-Drain Diode

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

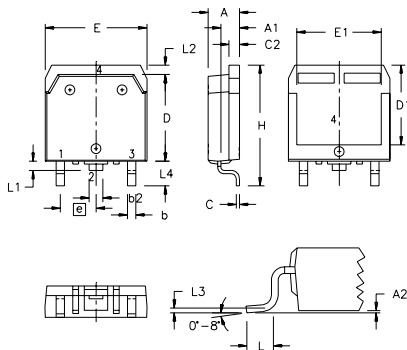
| Symbol | Test Conditions | min. | typ. | max. |
|----------|---|------|------|---------------|
| I_S | $V_{GS} = 0\text{ V}$ | | | 20 A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | | 80 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 1.5 V |
| t_{rr} | $I_F = I_S - di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | 1 | 250 ns |
| Q_{RM} | | | 9 | μC |
| I_{RM} | | | | A |

TO-264 AA Outline



| Dim. | Millimeter | | Inches | |
|----------------|------------|----------|--------|----------|
| | Min. | Max. | Min. | Max. |
| A | 4.82 | 5.13 | .190 | .202 |
| A ₁ | 2.54 | 2.89 | .100 | .114 |
| A ₂ | 2.00 | 2.10 | .079 | .083 |
| b | 1.12 | 1.42 | .044 | .056 |
| b ₁ | 2.39 | 2.69 | .094 | .106 |
| b ₂ | 2.90 | 3.09 | .114 | .122 |
| c | 0.53 | 0.83 | .021 | .033 |
| D | 25.91 | 26.16 | 1.020 | 1.030 |
| E | 19.81 | 19.96 | .780 | .786 |
| e | | 5.46 BSC | | .215 BSC |
| J | 0.00 | 0.25 | .000 | .010 |
| K | 0.00 | 0.25 | .000 | .010 |
| L | 20.32 | 20.83 | .800 | .820 |
| L ₁ | 2.29 | 2.59 | .090 | .102 |
| P | 3.17 | 3.66 | .125 | .144 |
| Q | 6.07 | 6.27 | .239 | .247 |
| Q ₁ | 8.38 | 8.69 | .330 | .342 |
| R | 3.81 | 4.32 | .150 | .170 |
| R ₁ | 1.78 | 2.29 | .070 | .090 |
| S | 6.04 | 6.30 | .238 | .248 |
| T | 1.57 | 1.83 | .062 | .072 |

TO-268 Outline



| 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.



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