

HiPerRF™

Power MOSFETs

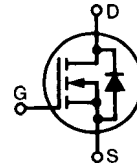
F-Class: MegaHertz Switching

N-Channel Enhancement Mode
 Avalanche Rated, Low Q_g , Low Intrinsic R_g
 High dV/dt , Low t_{rr}

IXFH12N100F
IXFT 12N100F

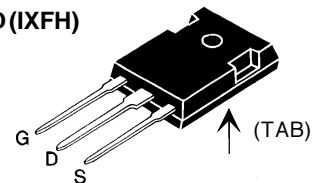
$V_{DSS} = 1000 \text{ V}$
 $I_{D25} = 12 \text{ A}$
 $R_{DS(on)} = 1.05 \Omega$

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

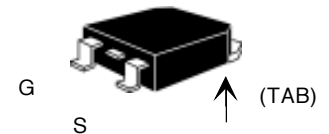


| Symbol | Test Conditions | Maximum Ratings | |
|-----------|---|-----------------|-------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 1000 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$ | 1000 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 12 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 48 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 12 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 30 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.0 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$ | 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 | TO-247 | 1.13/10 Nm/lb.in. |
| Weight | | TO-247 | 6 g |
| | | TO-268 | 4 g |

TO-247 AD (IXFH)



TO-268 (IXFT) Case Style



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

Features

- RF capable MOSFETs
- Double metal process for low gate resistance
- 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
- Switched-mode and resonant-mode power supplies, >500kHz switching
- DC choppers
- 13.5 MHz industrial applications
- Pulse generation
- Laser drivers
- RF amplifiers

Advantages

- Space savings
- High power density

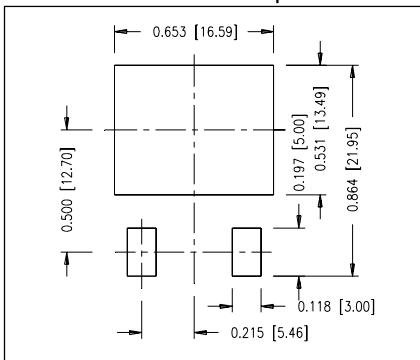
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|----------------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ mA}$ | 1000 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$ | 3.0 | | 5.5 V |
| I_{GSS} | $V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$ | | | $\pm 100 \text{ nA}$ |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$ | | | 50 μA 1.5 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Note 1 | | | 1.05 Ω |

| Symbol | Test Conditions | Characteristic Values | | |
|---------------------------|---|---|------|------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| g_{fs} | V _{DS} = 10 V; I _D = 0.5 I _{D25} Note 1 | 8 | 12 | S |
| C_{iss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 2700 | pF |
| C_{oss} | | | 305 | pF |
| C_{rss} | | | 93 | pF |
| t_{d(on)} | V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} , I _D = 0.5 I _{D25} R _G = 2.0 Ω (External) | | 12 | ns |
| t_r | | | 9.8 | ns |
| t_{d(off)} | | | 31 | ns |
| t_f | | | 12 | ns |
| Q_{g(on)} | V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} , I _D = 0.5 I _{D25} | | 77 | nC |
| Q_{gs} | | | 16 | nC |
| Q_{gd} | | | 42 | nC |
| R_{thJC} | | | 0.42 | K/W |
| R_{thCK} | (TO-247) | | 0.25 | K/W |

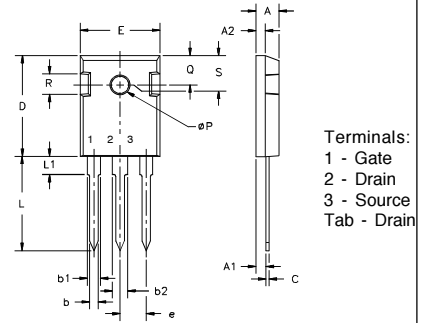
| Symbol | Test Conditions | Characteristic Values | | |
|-----------------------|---|---|------|--------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| I_S | V _{GS} = 0 V | | | 12 A |
| I_{SM} | Repetitive; pulse width limited by T _{JM} | | | 48 A |
| V_{SD} | I _F = I _S , V _{GS} = 0 V, Note 1 | | | 1.5 V |
| t_{rr} | I _F = I _S , -di/dt = 100 A/μs, V _R = 100 V | | | 250 ns |
| Q_{RM} | | | 0.8 | μC |
| I_{RM} | | | 7 | A |

Note: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %

Min Recommended Footprint

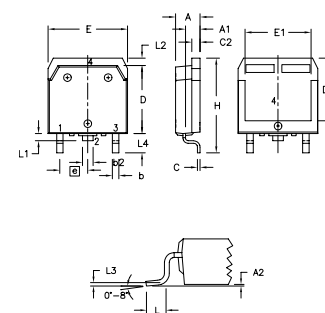


TO-247 AD Outline



| 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 |
| 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 ₂ | 1.9 | 2.1 | .75 | .83 |
| C | .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 |

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
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025