

HiPerFET™ Power MOSFETs

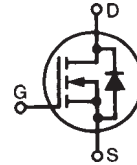
ISOPLUS247™ Q CLASS

| | | | |
|--------------|-----------|-----------|---------------|
| | V_{DSS} | I_{D25} | $R_{DS(on)}$ |
| IXFR 12N100Q | 1000 V | 10 A | 1.1 Ω |
| IXFR 10N100Q | 1000 V | 9 A | 1.20 Ω |

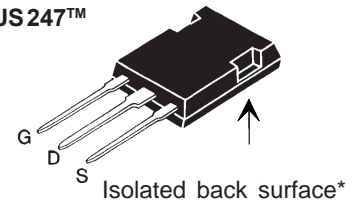
(Electrically Isolated Back Surface)

$t_{rr} \leq 300 \mu s$

N-Channel Enhancement Mode
Avalanche Rated, High dV/dt
Low Gate Charge and Capacitances



ISOPLUS247™



G = Gate D = Drain
S = Source

* Patent pending

| Symbol | Test Conditions | Maximum Ratings | |
|------------|---|-----------------|------------|
| V_{DSS} | $T_J = 25^\circ C$ to $150^\circ C$ | 1000 | V |
| V_{DGR} | $T_J = 25^\circ C$ to $150^\circ C$; $R_{GS} = 1 M\Omega$ | 1000 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ C$ | 12N100 | 10 A |
| | | 10N100 | 9 A |
| I_{DM} | $T_C = 25^\circ C$, Pulse width limited by T_{JM} | 12N100 | 48 A |
| | | 10N100 | 40 A |
| I_{AR} | $T_C = 25^\circ C$ | 12N100 | 12 A |
| | | 10N100 | 10 A |
| E_{AR} | $T_C = 25^\circ C$ | 30 | mJ |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100 A/\mu s$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ C$, $R_G = 2 \Omega$ | 5 | V/ns |
| P_D | $T_C = 25^\circ C$ | 250 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | 1.6 mm (0.063 in.) from case for 10 s | 300 | $^\circ C$ |
| V_{ISOL} | 50/60 Hz, RMS $t = 1$ min | 2500 | V~ |
| Weight | | 5 | g |

Features

- Silicon chip on Direct-Copper-Bond substrate
 - High power dissipation
 - Isolated mounting surface
 - 2500V electrical isolation
- Low drain to tab capacitance (<50pF)
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic Rectifier

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

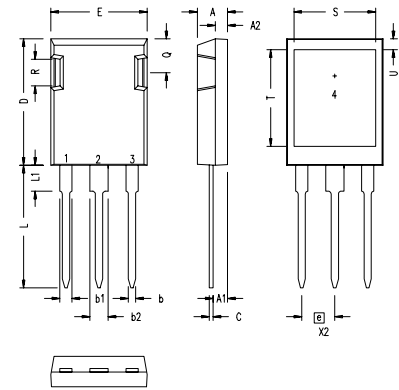
- Easy assembly
- Space savings
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ C$, unless otherwise specified) | | |
|--------------|--|---|------|------------------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0 V$, $I_D = 3mA$ | 1000 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4mA$ | 2.5 | | V |
| I_{GSS} | $V_{GS} = \pm 20 V_{DC}$, $V_{DS} = 0$ | | | ± 100 nA |
| I_{DSS} | $V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 V$ | $T_J = 25^\circ C$ $T_J = 125^\circ C$ | | 50 μA 1 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 V$, $I_D = I_T$ Notes 1 & 2 | 12N100 10N100 | | 1.1 Ω 1.2 Ω |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | |
|--------------|--|---|-----------------------|------|------|
| | | | min. | typ. | max. |
| g_{fs} | $V_{DS} = 15\text{ V}; I_D = I_T$ | Note 1 | 4 | 10 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | | 2900 | pF |
| C_{oss} | | | | 315 | pF |
| C_{rss} | | | | 50 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External), | | | 20 | ns |
| t_r | | | | 23 | ns |
| $t_{d(off)}$ | | | | 40 | ns |
| t_f | | | | 15 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ | | | 90 | nC |
| Q_{gs} | | | | 30 | nC |
| Q_{gd} | | | | 40 | nC |
| R_{thJC} | | | | 0.50 | K/W |
| R_{thCK} | | | 0.15 | | K/W |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | | |
|----------|--|---|------|-------|---------------|
| | | min. | typ. | max. | |
| I_S | $V_{GS} = 0\text{ V}$ | | | 12 A | |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | | 48 A | |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$, Note 1 | | | 1.3 V | |
| t_{rr} | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | | 200 | 300 ns |
| Q_{RM} | | | | 1.6 | μC |
| I_{RM} | | | | 7 | A |

Note: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$
 2. I_T test current: IXFR10N100 $I_T = 5\text{ A}$
 IXFR12N100 $I_T = 6\text{ A}$

ISOPLUS 247 OUTLINE


| SYM | INCHES | | MILLIMETERS | |
|-----|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .090 | .100 | 2.29 | 2.54 |
| A2 | .075 | .085 | 1.91 | 2.16 |
| b | .045 | .055 | 1.14 | 1.40 |
| b1 | .075 | .084 | 1.91 | 2.13 |
| b2 | .115 | .123 | 2.92 | 3.12 |
| C | .024 | .031 | 0.61 | 0.80 |
| D | .819 | .840 | 20.80 | 21.34 |
| E | .620 | .635 | 15.75 | 16.13 |
| e | .215 BSC | | 5.45 BSC | |
| L | .780 | .800 | 19.81 | 20.32 |
| L1 | .150 | .170 | 3.81 | 4.32 |
| Q | .220 | .244 | 5.59 | 6.20 |
| R | .170 | .190 | 4.32 | 4.83 |
| S | .520 | .540 | 13.21 | 13.72 |
| T | .620 | .640 | 15.75 | 16.26 |
| U | .065 | .080 | 1.65 | 2.03 |

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

Note: Please see IXFH12N100Q Data Sheet for characteristic curves.



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