

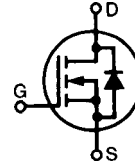
# HiPerFET™ Power MOSFETs

## ISOPLUS247™

IXFR 26N50Q  
IXFR 24N50Q

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode  
High dV/dt, Low  $t_{rr}$ , HDMOS™ Family



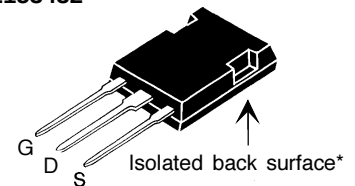
| $V_{DSS}$ | $I_{D25}$ | $R_{DS(on)}$  |
|-----------|-----------|---------------|
| 500 V     | 24 A      | 0.20 $\Omega$ |
| 500 V     | 22 A      | 0.23 $\Omega$ |

$t_{rr} \leq 250$  ns

| Symbol     | Test Conditions                                                                                                                    | Maximum Ratings         |                  |
|------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                                                                                    | 500                     | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1$ M $\Omega$                                                          | 500                     | V                |
| $V_{GS}$   | Continuous                                                                                                                         | $\pm 20$                | V                |
| $V_{GSM}$  | Transient                                                                                                                          | $\pm 30$                | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                                                                                           | 26N50Q 24<br>24N50Q 22  | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , Pulse width limited by $T_{JM}$                                                                         | 26N50Q 104<br>24N50Q 96 | A                |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                           | 26N50Q 26<br>24N50Q 24  | 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/ $\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2$ $\Omega$ | 5                       | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$                                                                                                           | 250                     | 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 (0.062 in.) from case for 10 s                                                                                              | 300                     | $^\circ\text{C}$ |
| $V_{ISOL}$ | 50/60 Hz, RMS $t = 1$ minute leads-to-tab                                                                                          | 2500                    | V~               |
| Weight     |                                                                                                                                    | 5                       | g                |

ISOPLUS 247™

® E153432



G = Gate D = Drain  
S = Source

\* Patent pending

### Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<35pF)
- 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: no screws, or isolation foils required
- Space savings
- High power density
- Low collector capacitance to ground (low EMI)

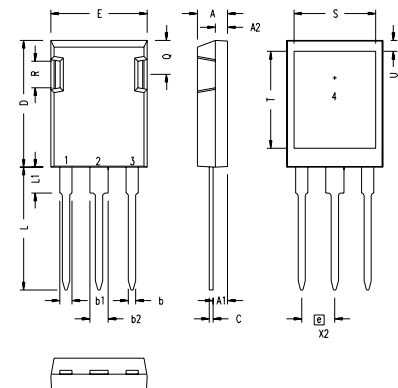
| Symbol       | Test Conditions                             | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                                |
|--------------|---------------------------------------------|-----------------------------------------------------------------------------------|------|--------------------------------|
|              |                                             | min.                                                                              | typ. | max.                           |
| $V_{DSS}$    | $V_{GS} = 0$ V, $I_D = 250$ $\mu\text{A}$   | 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, $V_{DS} = 0$           |                                                                                   |      | $\pm 100$ nA                   |
| $I_{DSS}$    | $V_{DS} = 0.8$ $V_{DSS}$<br>$V_{GS} = 0$ V  |                                                                                   |      | 25 $\mu\text{A}$<br>1 mA       |
| $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = I_T$<br>Notes 1 & 2 | 26N50Q<br>24N50Q                                                                  |      | 0.20 $\Omega$<br>0.23 $\Omega$ |

| Symbol       | Test Conditions                                                                                 |        | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |          |
|--------------|-------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------|------|----------|
|              |                                                                                                 |        | min.                                                                              | typ. | max.     |
| $g_{fs}$     | $V_{DS} = 15\text{ V}; I_D = I_T$                                                               | Note 1 | 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       |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5\text{ V}_{DSS}, I_D = I_T$<br>$R_G = 1\ \Omega$ (External), |        |                                                                                   | 28   | ns       |
| $t_r$        |                                                                                                 |        |                                                                                   | 30   | ns       |
| $t_{d(off)}$ |                                                                                                 |        |                                                                                   | 55   | ns       |
| $t_f$        |                                                                                                 |        |                                                                                   | 16   | ns       |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5\text{ V}_{DSS}, I_D = I_T$                                  |        |                                                                                   | 95   | nC       |
| $Q_{gs}$     |                                                                                                 |        |                                                                                   | 27   | nC       |
| $Q_{gd}$     |                                                                                                 |        |                                                                                   | 40   | nC       |
| $R_{thJC}$   |                                                                                                 |        |                                                                                   |      | 0.50 K/W |
| $R_{thCK}$   |                                                                                                 |        |                                                                                   | 0.15 | K/W      |

| Symbol   | Test Conditions                                                          |                          | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                   |
|----------|--------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------|------|-------------------|
|          |                                                                          |                          | min.                                                                              | typ. | max.              |
| $I_S$    | $V_{GS} = 0\text{ V}$                                                    |                          |                                                                                   |      | 26 A              |
| $I_{SM}$ | Repetitive; pulse width limited by $T_{JM}$                              |                          |                                                                                   |      | 104 A             |
| $V_{SD}$ | $I_F = I_S, V_{GS} = 0\text{ V}$ , Note 1                                |                          |                                                                                   |      | 1.3 V             |
| $t_{rr}$ | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}$ ,<br>$V_R = 100\text{ V}$ | $T_J = 25^\circ\text{C}$ | 0.85                                                                              |      | 250 ns            |
| $Q_{RM}$ |                                                                          | $T_J = 25^\circ\text{C}$ |                                                                                   |      | 1.5 $\mu\text{C}$ |
| $I_{RM}$ |                                                                          | $T_J = 25^\circ\text{C}$ |                                                                                   |      | 8 A               |

- Note: 1. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$   
 2.  $I_T$  test current: IXFR26N50Q  $I_T = 13\text{ A}$   
 IXFR24N50Q  $I_T = 12\text{ A}$   
 3. See IXFH26N50Q data sheet for characteristic curves.

### 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.