

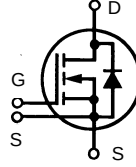
# HiPerFET™

## Power MOSFETs

### Single Die MOSFET

N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt, Low  $t_{rr}$

## IXFN 48N55



$$V_{DSS} = 550 \text{ V}$$

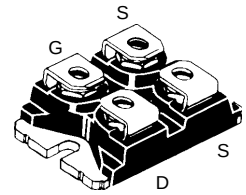
$$I_{D25} = 48 \text{ A}$$

$$R_{DS(on)} = 110 \text{ m}\Omega$$

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

| Symbol     | Test Conditions                                                                                                                         | Maximum Ratings  |                        |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                                                                                         | 550              | V                      |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$                                                          | 550              | V                      |
| $V_{GS}$   | Continuous                                                                                                                              | $\pm 20$         | V                      |
| $V_{GSM}$  | Transient                                                                                                                               | $\pm 30$         | V                      |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                                                                                                | 48               | A                      |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                                              | 192              | A                      |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                                | 44               | A                      |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                                | 60               | mJ                     |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                                                                                                | 3                | J                      |
| dv/dt      | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 5                | V/ns                   |
| $P_D$      | $T_C = 25^\circ\text{C}$                                                                                                                | 600              | W                      |
| $T_J$      |                                                                                                                                         | -55 ... +150     | $^\circ\text{C}$       |
| $T_{JM}$   |                                                                                                                                         | 150              | $^\circ\text{C}$       |
| $T_{stg}$  |                                                                                                                                         | -55 ... +150     | $^\circ\text{C}$       |
| $T_J$      | 1.6 mm (0.63 in) from case for 10 s                                                                                                     | -                | $^\circ\text{C}$       |
| $V_{ISOL}$ | 50/60 Hz, RMS $t = 1 \text{ min}$<br>$I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$                                                     | 2500<br>3000     | V~<br>V~               |
| $M_d$      | Mounting torque<br>Terminal connection torque                                                                                           | 1.5/13<br>1.5/13 | Nm/lb.in.<br>Nm/lb.in. |
| Weight     |                                                                                                                                         | 30               | g                      |

miniBLOC, SOT-227 B  
E153432



G = Gate  
S = Source  
D = Drain

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

#### Features

- International standard package
- miniBLOC, with Aluminium nitride isolation
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

#### Applications

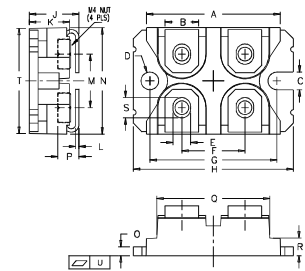
- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

#### Advantages

- Easy to mount
- Space savings
- High power density

| Symbol       | Test Conditions                                                                                                        | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|--------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------------------|
|              |                                                                                                                        | min.                                                                              | typ. | max.                      |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$                                                                          | 550                                                                               |      | V                         |
| $V_{GH(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$                                                                               | 2.5                                                                               |      | 4.5 V                     |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$                                                                        |                                                                                   |      | $\pm 100 \text{ nA}$      |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $V_{GS} = 0 \text{ V}$<br>$T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$                   |                                                                                   |      | 100 $\mu\text{A}$<br>2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2 \%$ |                                                                                   |      | 110 m $\Omega$            |

| Symbol       | Test Conditions                                                                                              | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |      |
|--------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|
|              |                                                                                                              | min.                                                                              | typ. | max. |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test                                                 | 30                                                                                | 45   | S    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                                                |                                                                                   | 8900 | pF   |
| $C_{oss}$    |                                                                                                              |                                                                                   | 1000 | pF   |
| $C_{rss}$    |                                                                                                              |                                                                                   | 330  | pF   |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$<br>$R_G = 1\ \Omega$ (External), |                                                                                   | 42   | ns   |
| $t_r$        |                                                                                                              |                                                                                   | 55   | ns   |
| $t_{d(off)}$ |                                                                                                              |                                                                                   | 110  | ns   |
| $t_f$        |                                                                                                              |                                                                                   | 45   | ns   |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$                                  |                                                                                   | 330  | nC   |
| $Q_{gs}$     |                                                                                                              |                                                                                   | 60   | nC   |
| $Q_{gd}$     |                                                                                                              |                                                                                   | 65   | nC   |
| $R_{thJC}$   |                                                                                                              |                                                                                   | 0.21 | K/W  |
| $R_{thCK}$   |                                                                                                              |                                                                                   | 0.05 | K/W  |

**miniBLOC, SOT-227 B**


M4 screws (4x) supplied

| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | Min.       | Max.  | Min.   | Max.  |
| A    | 31.50      | 31.88 | 1.240  | 1.255 |
| B    | 7.80       | 8.20  | 0.307  | 0.323 |
| C    | 4.09       | 4.29  | 0.161  | 0.169 |
| D    | 4.09       | 4.29  | 0.161  | 0.169 |
| E    | 4.09       | 4.29  | 0.161  | 0.169 |
| F    | 14.91      | 15.11 | 0.587  | 0.595 |
| G    | 30.12      | 30.30 | 1.186  | 1.193 |
| H    | 38.00      | 38.23 | 1.496  | 1.505 |
| J    | 11.68      | 12.22 | 0.460  | 0.481 |
| K    | 8.92       | 9.60  | 0.351  | 0.378 |
| L    | 0.76       | 0.84  | 0.030  | 0.033 |
| M    | 12.60      | 12.85 | 0.496  | 0.506 |
| N    | 25.15      | 25.42 | 0.990  | 1.001 |
| O    | 1.98       | 2.13  | 0.078  | 0.084 |
| P    | 4.95       | 5.97  | 0.195  | 0.235 |
| Q    | 26.54      | 26.90 | 1.045  | 1.059 |
| R    | 3.94       | 4.42  | 0.155  | 0.174 |
| S    | 4.72       | 4.85  | 0.186  | 0.191 |
| T    | 24.59      | 25.07 | 0.968  | 0.987 |
| U    | -0.05      | 0.1   | -0.002 | 0.004 |

| Symbol   | Test Conditions                                                                                       | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|----------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------|
|          |                                                                                                       | min.                                                                              | typ. | max.          |
| $I_S$    | $V_{GS} = 0\text{ V}$                                                                                 |                                                                                   |      | 48 A          |
| $I_{SM}$ | Repetitive;<br>pulse width limited by $T_{JM}$                                                        |                                                                                   |      | 192 A         |
| $V_{SD}$ | $I_F = I_S, V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |                                                                                   |      | 1.3 V         |
| $t_{rr}$ | $I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                            |                                                                                   |      | 250 ns        |
| $Q_{RM}$ |                                                                                                       | 1.4                                                                               |      | $\mu\text{C}$ |
| $I_{RM}$ |                                                                                                       | 8                                                                                 |      | A             |