

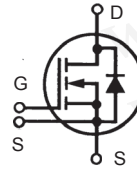
# HiPerFET™

## Power MOSFETs

### Single Die MOSFET

IXFN 80N50

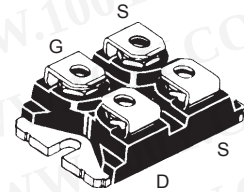
N-Channel Enhancement Mode  
 Avalanche Rated, High dv/dt, Low  $t_{rr}$



$$\begin{aligned} V_{DSS} &= 500 \text{ V} \\ I_{D25} &= 80 \text{ A} \\ R_{DS(on)} &= 55 \text{ m}\Omega \\ t_{rr} &\leq 250 \text{ ns} \end{aligned}$$

| 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 $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$                                                          | 500              | V                      |
| $V_{GS}$   | Continuous                                                                                                                              | $\pm 20$         | V                      |
| $V_{GSM}$  | Transient                                                                                                                               | $\pm 30$         | V                      |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$ , Chip capability                                                                                              | 80               | A                      |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                                              | 320              | A                      |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                                | 80               | A                      |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                                | 64               | mJ                     |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                                                                                                | 6                | 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                   |
| $P_D$      | $T_C = 25^\circ\text{C}$                                                                                                                | 780              | W                      |
| $T_J$      |                                                                                                                                         | -55 ... +150     | $^\circ\text{C}$       |
| $T_{JM}$   |                                                                                                                                         | 150              | $^\circ\text{C}$       |
| $T_{stg}$  |                                                                                                                                         | -55 ... +150     | $^\circ\text{C}$       |
| $V_{ISOL}$ | 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 (IXFN)  
 E153432



G = Gate  
 S = Source  
 D = Drain

Either Source terminal of 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

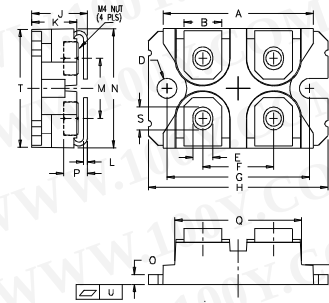
#### Advantages

- 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.                      |
| $V_{DSS}$    | $V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$                                                                             | 500                                                                               |      | V                         |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$                                                                                  | 2.5                                                                               |      | 4.5 V                     |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$                                                                           |                                                                                   |      | $\pm 200 \text{ nA}$      |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $V_{GS} = 0 \text{ V}$<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, $t \leq 300 \mu\text{s}$ ,<br>duty cycle $d \leq 2 \%$ |                                                                                   |      | 55 m $\Omega$             |

| Symbol       | Test Conditions                                                                                              | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |      |
|--------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|
|              |                                                                                                              | min.                                                                              | typ. | max. |
| $g_{fs}$     | $V_{DS} = 15\text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test                                                 | 50                                                                                | 70   | S    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                                                |                                                                                   | 9890 | pF   |
| $C_{oss}$    |                                                                                                              |                                                                                   | 1750 | pF   |
| $C_{rss}$    |                                                                                                              |                                                                                   | 460  | 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), |                                                                                   | 61   | ns   |
| $t_r$        |                                                                                                              |                                                                                   | 70   | ns   |
| $t_{d(off)}$ |                                                                                                              |                                                                                   | 102  | ns   |
| $t_f$        |                                                                                                              |                                                                                   | 27   | ns   |
| $Q_{G(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$                                  |                                                                                   | 380  | nC   |
| $Q_{GS}$     |                                                                                                              |                                                                                   | 80   | nC   |
| $Q_{GD}$     |                                                                                                              |                                                                                   | 173  | nC   |
| $R_{thJC}$   |                                                                                                              |                                                                                   | 0.16 | 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 |

## Source-Drain Diode

| Symbol   | Test Conditions                                                                              | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|----------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------|
|          |                                                                                              | min.                                                                              | typ. | max.          |
| $I_S$    | $V_{GS} = 0\text{ V}$                                                                        |                                                                                   |      | 80 A          |
| $I_{SM}$ | Repetitive;<br>pulse width limited by $T_{JM}$                                               |                                                                                   |      | 320 A         |
| $V_{SD}$ | $I_F = I_S, V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t < 300\text{ ms}$ , duty cycle $d < 2\%$ |                                                                                   |      | 1.3 V         |
| $t_{rr}$ | $I_F = 30\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                   |                                                                                   |      | 250 ns        |
| $Q_{RM}$ |                                                                                              | 1.2                                                                               |      | $\mu\text{C}$ |
| $I_{RM}$ |                                                                                              | 8                                                                                 |      | A             |

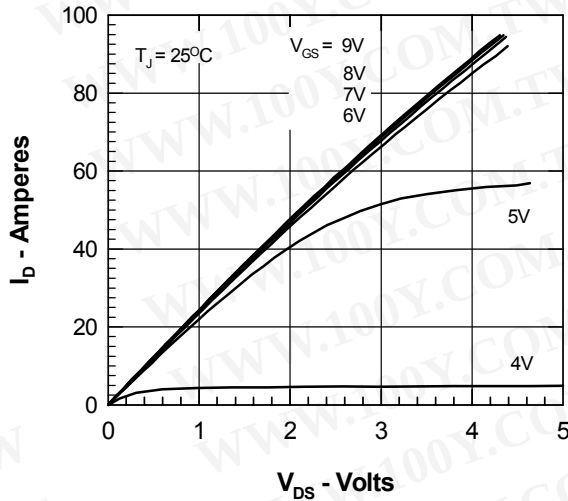


Fig. 1. Output Characteristics

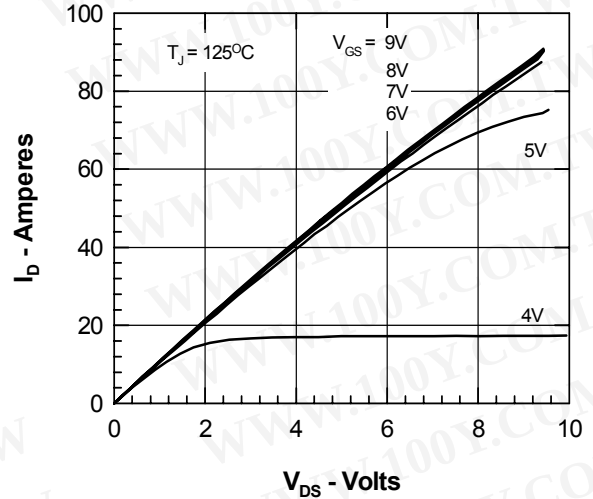


Fig. 2. High Temperature Output Characteristics

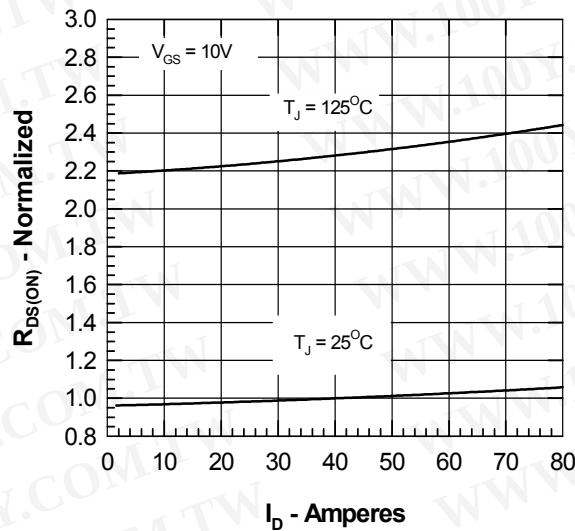


Fig. 3. Normalized  $R_{DS(on)}$  vs. Drain Current

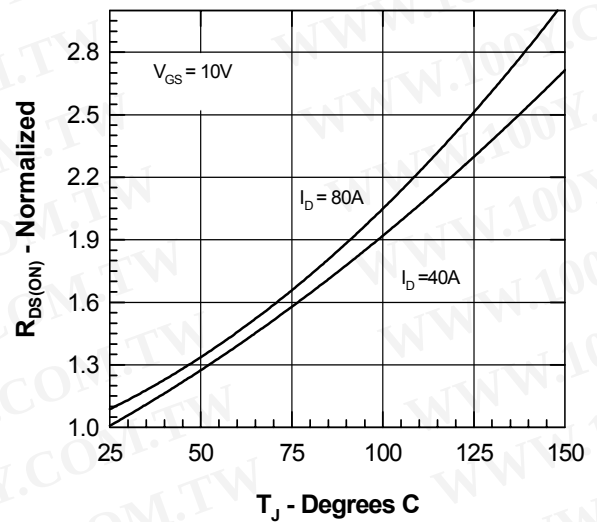


Fig. 4. Temperature Dependence of  $R_{DS(on)}$

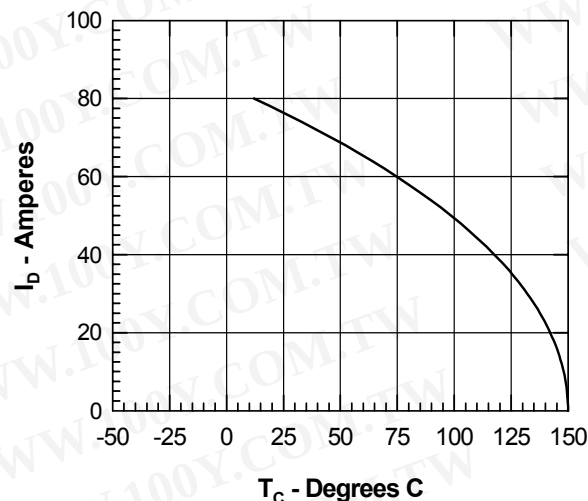


Fig. 5. Drain Current vs. Case Temperature

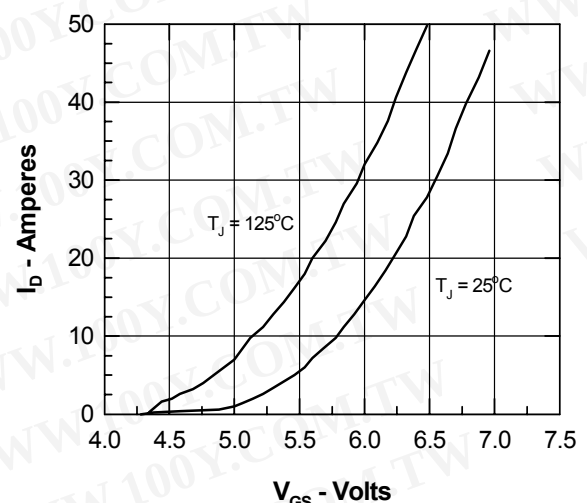


Fig. 6. Input Admittance

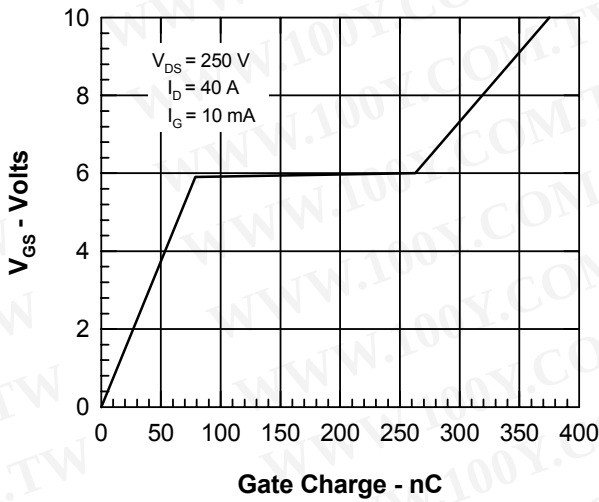


Fig. 7 Gate Charge Characteristic Curve

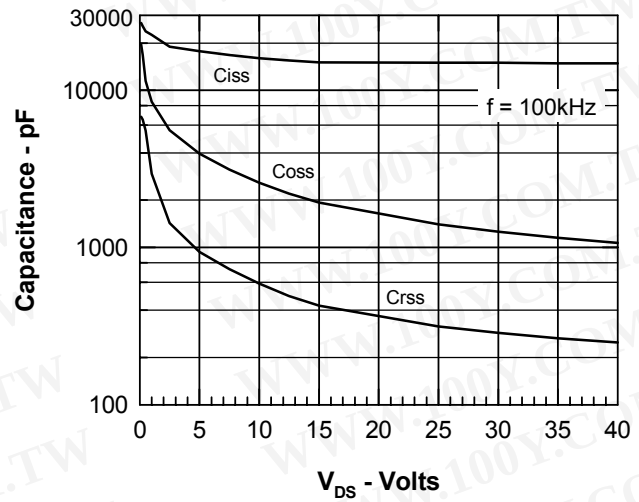


Fig. 8 Capacitance Curves

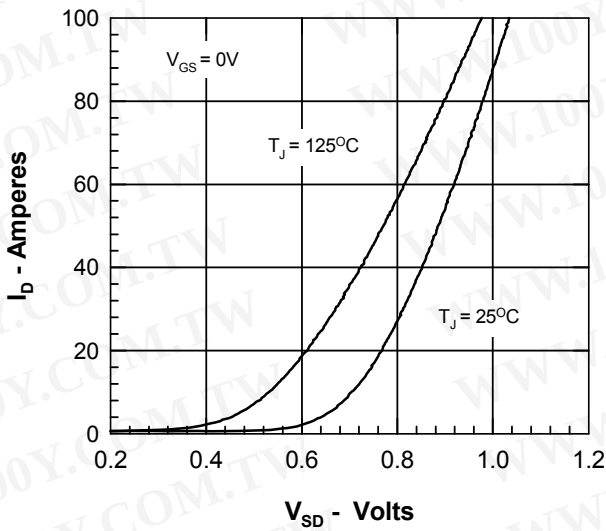


Fig. 9. Source-to-Drain Voltage Drop

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-34970699  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

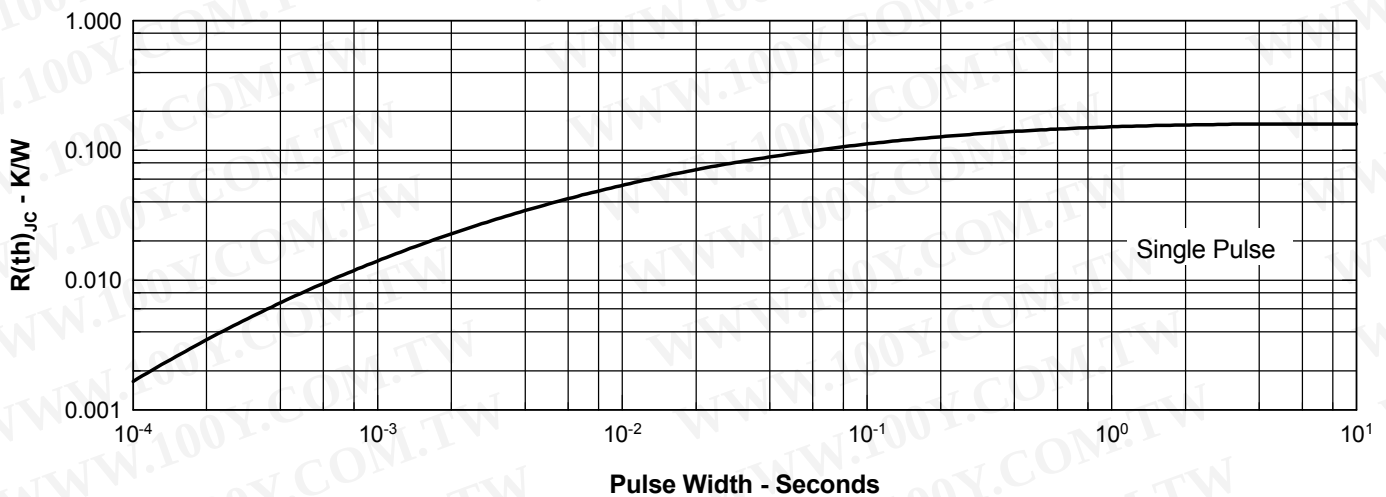


Fig.10. Transient Thermal Resistance