

# HiPerFET™

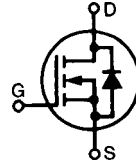
## Power MOSFETs

### Single MOSFET Die

## IXFN 120N20

$V_{DSS} = 200\text{ V}$   
 $I_{D25} = 120\text{ A}$   
 $R_{DS(on)} = 17\text{ m}\Omega$   
 $t_{rr} \leq 250\text{ ns}$

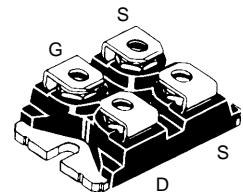
N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt, Low  $t_{rr}$



Preliminary data sheet

| Symbol        | Test Conditions   | Maximum Ratings  |                        |
|---------------|---|------------------|------------------------|
| $V_{DSS}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$   | 200              | V                      |
| $V_{DGR}$     | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$   | 200              | V                      |
| $V_{GS}$      | Continuous  | $\pm 20$         | V                      |
| $V_{GSM}$     | Transient   | $\pm 30$         | V                      |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$  | 120              | A                      |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 480              | A                      |
| $I_{AR}$      | $T_C = 25^\circ\text{C}$  | 120              | A                      |
| $E_{AR}$      | $T_C = 25^\circ\text{C}$  | 64               | mJ                     |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$  | 3                | J                      |
| <b>dv/dt</b>  | $I_S \leq I_{DM}$ , $di/dt \leq 100\text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<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     | $^\circ\text{C}$       |
| $T_L$         | 1.6 mm (0.063 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. |
| <b>Weight</b> |   | 30               | g                      |

miniBLOC, SOT-227 B (IXFN)  
E153432



G = Gate                      D = Drain  
S = Source

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

### Features

- Encapsulating epoxy meets UL 94 V-0, flammability classification
- 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
- Low voltage relays

### Advantages

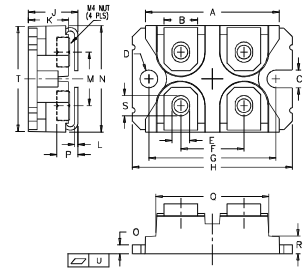
- Easy to mount
- Space savings
- High power density

| Symbol       | Test Conditions  | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|--------------|--|---|------|---------------------------|
|              |  | min.  | typ. | max.                      |
| $V_{DSS}$    | $V_{GS} = 0\text{ V}$ , $I_D = 3\text{ mA}$                  | 200   |      | V                         |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8\text{ mA}$                      | 2   |      | 4 V                       |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{ V}$ , $V_{DS} = 0$                    |   |      | $\pm 200\text{ nA}$       |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0\text{ V}$                  | $T_J = 25^\circ\text{C}$<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>Note 1 |   |      | 17 m $\Omega$             |

| Symbol       | Test Conditions  | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |      |
|--------------|--|---|------|------|
|              |  | min.  | typ. | max. |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ Note 1   | 40  | 77   | S    |
| $C_{iss}$    | } $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$  |   | 9100 | pF   |
| $C_{oss}$    |  |   | 2200 | pF   |
| $C_{rss}$    |  |   | 1000 | 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   |
| $t_f$        |  |   | 40   | ns   |
| $Q_{g(on)}$  | } $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$                                  |   | 360  | nC   |
| $Q_{gs}$     |  |   | 50   | nC   |
| $Q_{gd}$     |  |   | 160  | nC   |
| $R_{thJC}$   |  |   | 0.22 | K/W  |
| $R_{thCK}$   |  | 0.05  |      | K/W  |

| Source-Drain Diode |  | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|--------------------|--|---|------|---------------|
| Symbol             | Test Conditions  | min.  | typ. | max.          |
| $I_S$              | $V_{GS} = 0\text{ V}$  |   |      | 120 A         |
| $I_{SM}$           | Repetitive;<br>pulse width limited by $T_{JM}$                               |   |      | 480 A         |
| $V_{SD}$           | $I_F = I_S, V_{GS} = 0\text{ V}$ , Note 1                                    |   |      | 1.5 V         |
| $t_{rr}$           | } $I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ |   |      | 250 ns        |
| $Q_{RM}$           |  |   | 1.1  | $\mu\text{C}$ |
| $I_{RM}$           |  |   | 13   | A             |

Note: 1. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$

**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 |