

HiPerFET™ Power MOSFETs

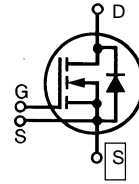
Single DieMOSFET

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

Preliminary data sheet

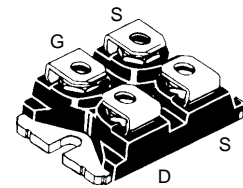
IXFN 34N80

$V_{DSS} = 800\text{ V}$
 $I_{D25} = 34\text{ A}$
 $R_{DS(on)} = 0.24\ \Omega$
 $t_{rr} \leq 250\text{ ns}$



| Symbol | Test Conditions | Maximum Ratings | |
|---------------|---|------------------|------------------------|
| V_{DSS} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$ | 800 | V |
| V_{DGR} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1\text{ M}\Omega$ | 800 | V |
| V_{GS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 34 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 136 | A |
| I_{AR} | | 34 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 64 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 3 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2\ \Omega$ | 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 | 300 | $^\circ\text{C}$ |
| V_{ISOL} | 50/60 Hz, RMS $t = 1\text{ min}$ $I_{ISOL} \leq 1\text{ mA}$ $t = 1\text{ s}$ | 2500 3000 | V~ V~ |
| M_d | Mounting torque Terminal connection torque | 1.5/13 1.5/13 | Nm/lb.in. Nm/lb.in. |
| Weight | | 30 | g |

miniBLOC, SOT-227 B
E153432



G = Gate D = Drain
S = Source

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

Features

- International standard packages
- 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

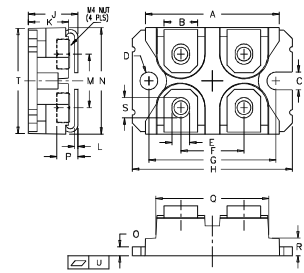
Advantages

- Easy to mount
- Space savings
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|---------------------------|
| | | min. | typ. | max. |
| V_{DSS} | $V_{GS} = 0\text{ V}$, $I_D = 3\text{ mA}$ V_{DSS} temperature coefficient | 800 | | V %/K |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8\text{ mA}$ $V_{GS(th)}$ temperature coefficient | 3.0 | | V %/K |
| I_{GSS} | $V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$ | | | 100 μA 2 mA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 0.24 Ω |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|------|
| | | min. | typ. | max. |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test | 20 | 35 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 7500 | pF |
| C_{oss} | | | 920 | pF |
| C_{rss} | | | 220 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External) | | 45 | ns |
| t_r | | | 45 | ns |
| $t_{d(off)}$ | | | 100 | ns |
| t_f | | | 40 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ | | 270 | nC |
| Q_{gs} | | | 60 | nC |
| Q_{gd} | | | 140 | nC |
| R_{thJC} | | | 0.22 | K/W |
| R_{thCK} | | 0.15 | | K/W |
| 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 ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|----------|---|---|------|---|
| | | min. | typ. | max. |
| I_S | $V_{GS} = 0\text{ V}$ | | | 34 A |
| I_{SM} | Repetitive; pulse width limited by T_{JM} | | | 136 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 1.5 V |
| t_{rr} | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$ | | | $T_J = 25^\circ\text{C}$ 250 ns |
| Q_{RM} | | | | $T_J = 125^\circ\text{C}$ 400 ns |
| I_{RM} | | | 1.4 | $T_J = 25^\circ\text{C}$ μC |
| | | | 10 | A |

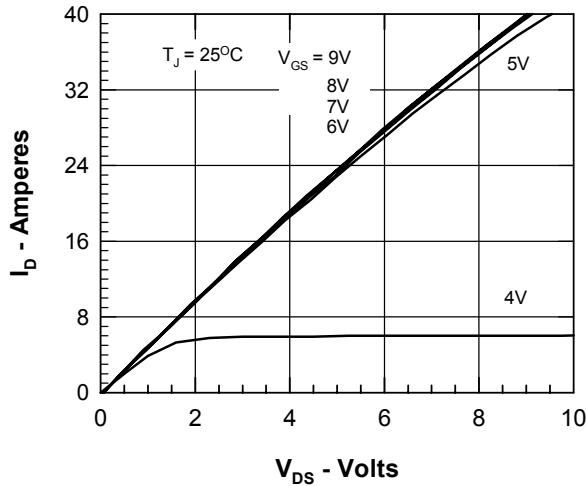


Figure 1. Output Characteristics at 25°C

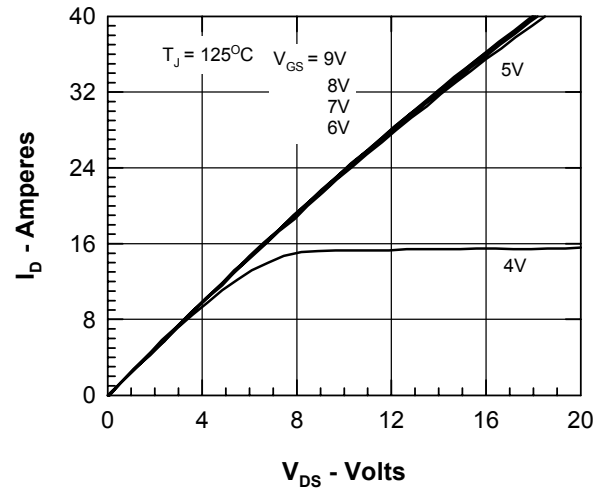


Figure 2. Output Characteristics at 125°C

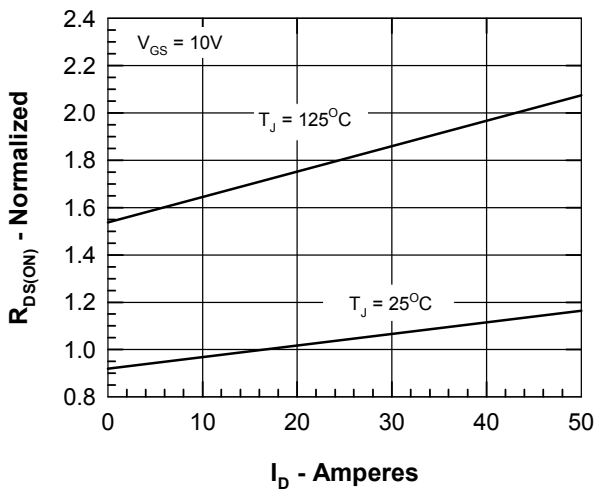


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

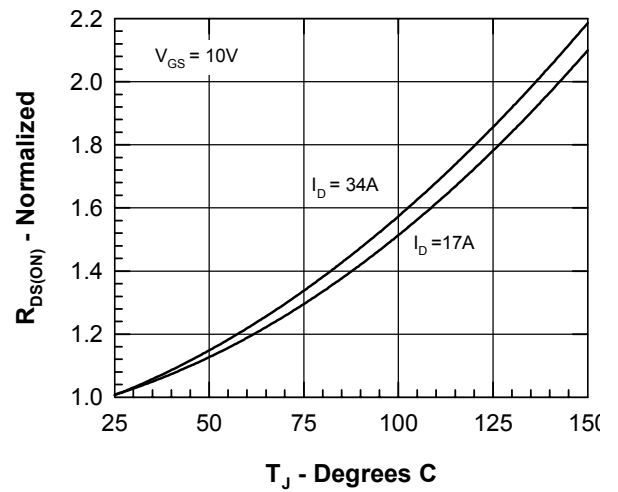


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

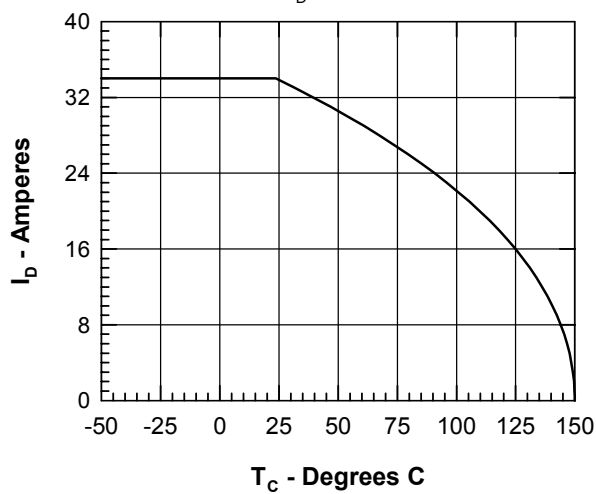


Figure 5. Drain Current vs. Case Temperature

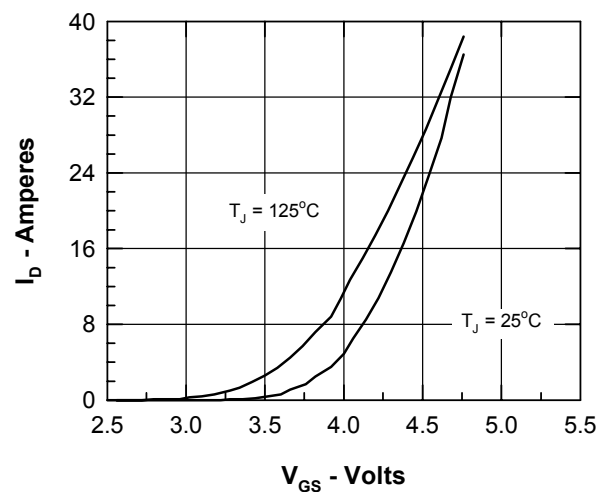


Figure 6. Admittance Curves

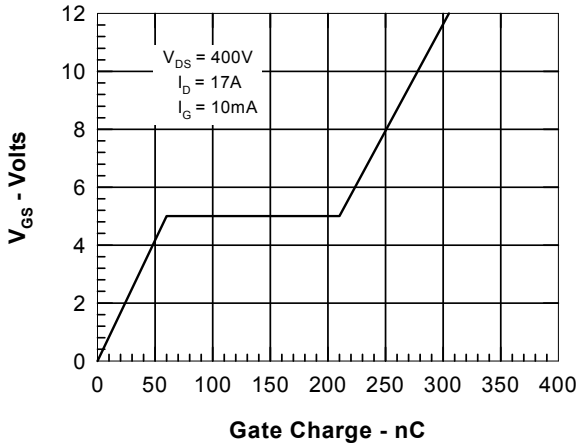


Figure 7. Gate Charge

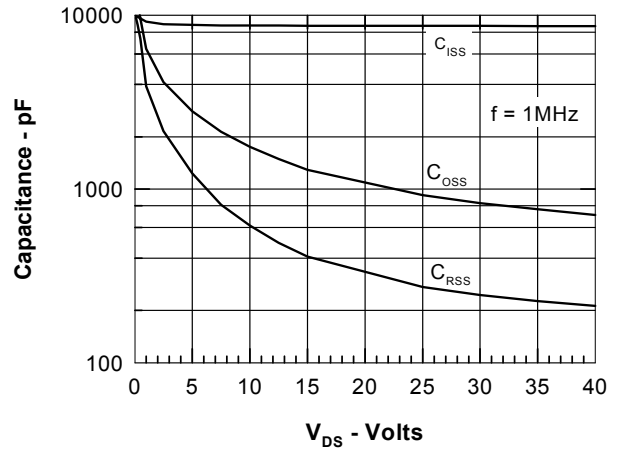


Figure 8. Capacitance Curves

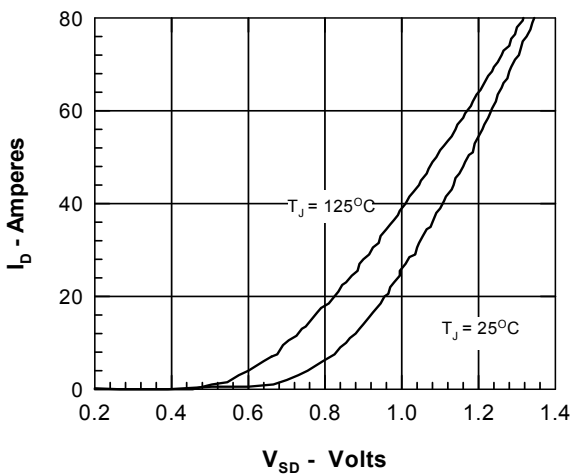


Figure 8. Forward Voltage Drop of the Intrinsic Diode

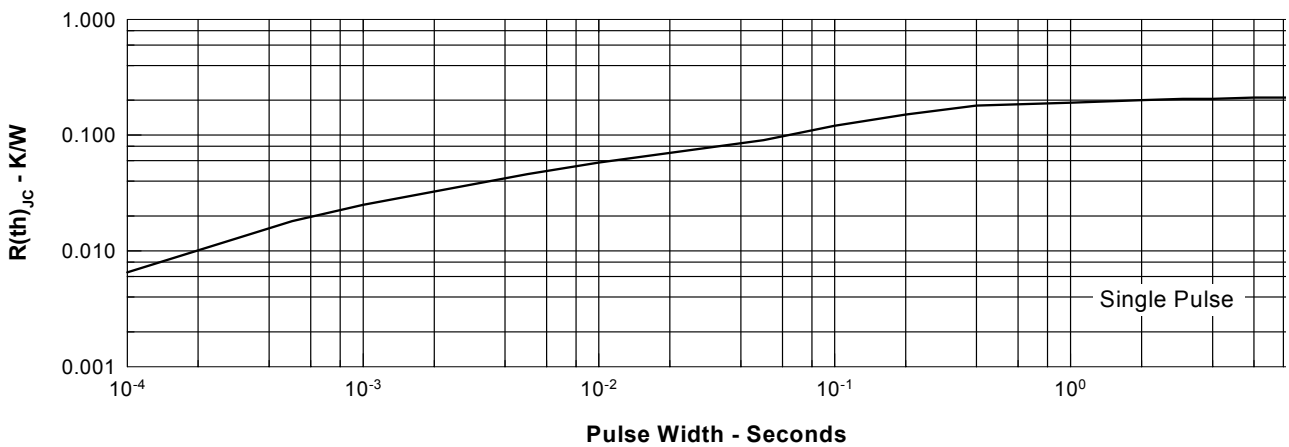


Figure 9. Transient Thermal Resistance