

HiPerFET™ Power MOSFET

IXFN 180N10

$$V_{DSS} = 100 \text{ V}$$

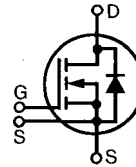
$$I_{D25} = 180 \text{ A}$$

$$R_{DS(on)} = 8 \text{ m}\Omega$$

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

Single MOSFET Die

Preliminary data sheet



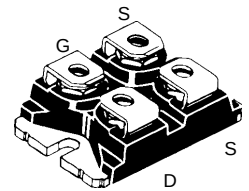
Symbol Test Conditions

Maximum Ratings

V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	100	V
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}, R_{GS} = 1\text{M}\Omega$	100	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	180	A
$I_{L(RMS)}$	Terminal (current limit)	100	A
I_{DM}	$T_C = 25^\circ\text{C}; \text{ Note 1}$	720	A
I_{AR}	$T_C = 25^\circ\text{C}$	180	A
E_{AR}	$T_C = 25^\circ\text{C}$	60	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	3	J
dv/dt	$I_S \leq I_{DM}, di/dt \leq 100 \text{ A}/\mu\text{s}, V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}, R_G = 2 \Omega$	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 Nm/lb.in. 1.5/13 Nm/lb.in.	
Weight		30	g

miniBLOC, SOT-227 B (IXFN)

 E153432



G = Gate
S = Source

D = Drain

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

Features

- International standard package
- Encapsulating epoxy meets UL 94 V-0, flammability classification
- 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
- Synchronous rectification
- 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 ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Characteristic Values

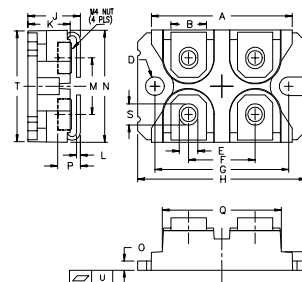
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0 \text{ V}, I_D = 3 \text{ mA}$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 8 \text{ mA}$	2		V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$			$100 \mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 0.5 \cdot I_{D25}$ Note 2			8 m Ω

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 60\text{ A}$, Note 2	60	90	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		9100	pF
C_{oss}			3200	pF
C_{rss}			1600	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),		50	ns
t_r			90	ns
$t_{d(off)}$			140	ns
t_f			65	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}			65	nC
Q_{gd}			190	nC
R_{thJC}	LOC, SOT-227 B		0.21	K/W
R_{thCK}	miniBLOC, SOT-227 B	0.05		K/W

Source-Drain Diode(T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0$			180 A
I_{SM}	Repetitive; pulse width limited by T _{JM}			720 A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 50\text{ V}$			250 ns
Q_{RM}		1.1		μC
I_{RM}		13		A

- Notes:
- Pulse width limited by T_{JM}.
 - Pulse test, $t \leq 300\text{ ms}$, 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

Figure 1. Output Characteristics at 25°C

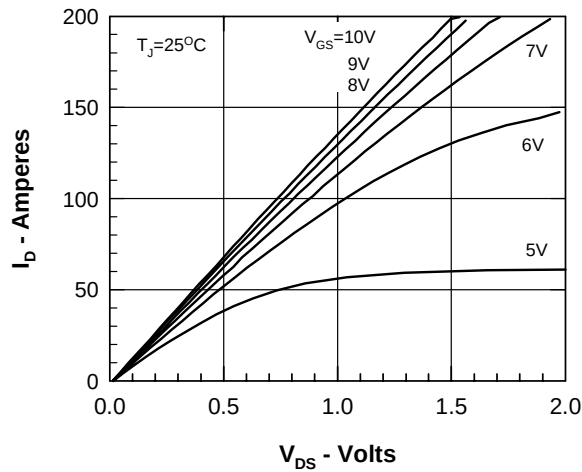


Figure 2. Output Characteristics at 125°C

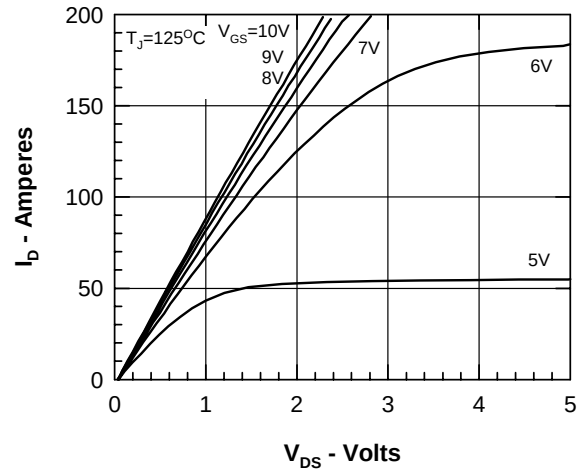
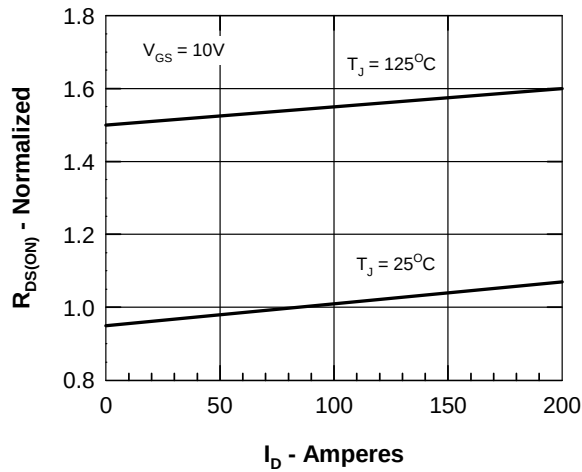
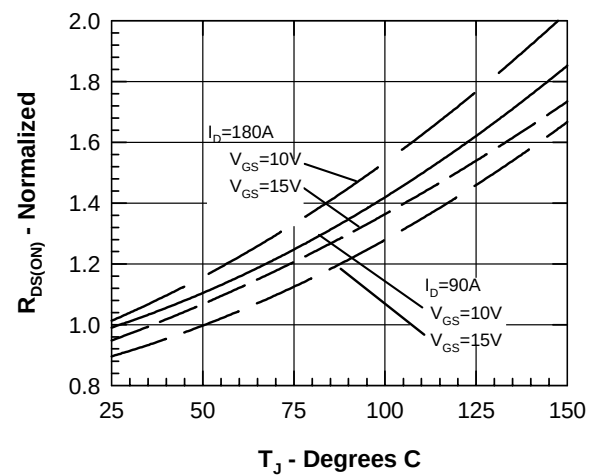

 Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

 Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J


Figure 5. Drain Current vs. Case Temperature

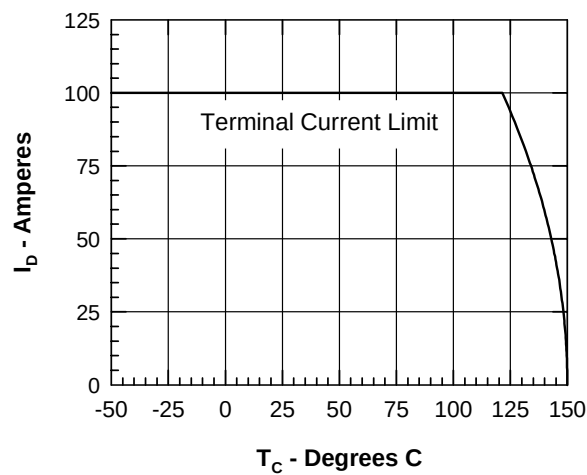


Figure 6. Admittance Curves

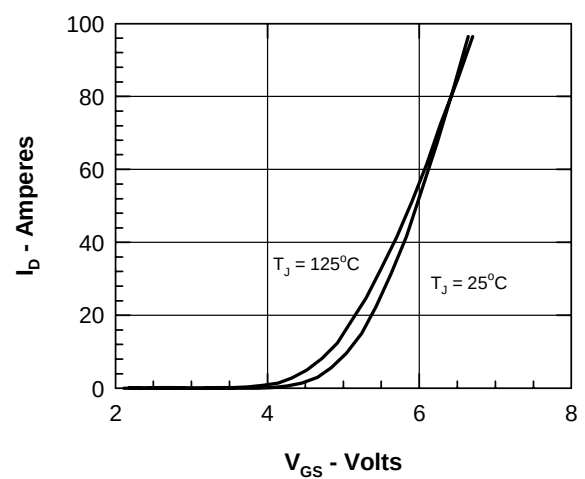
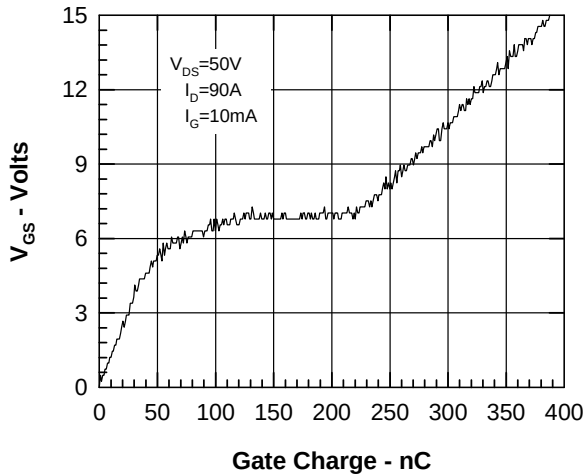
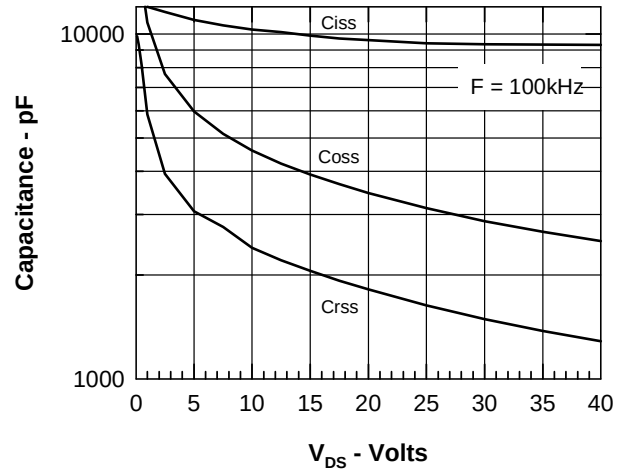
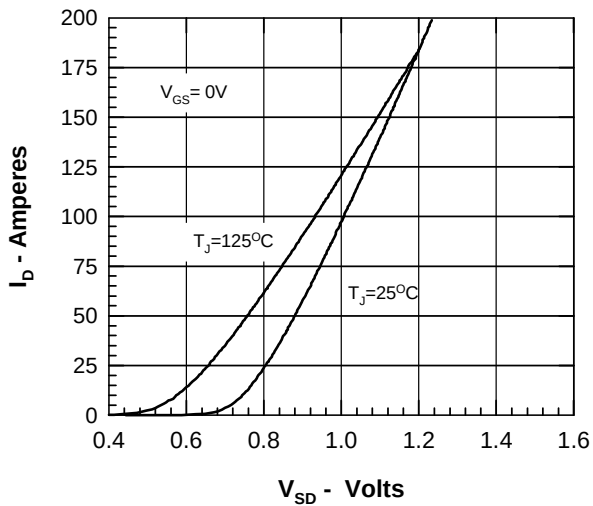
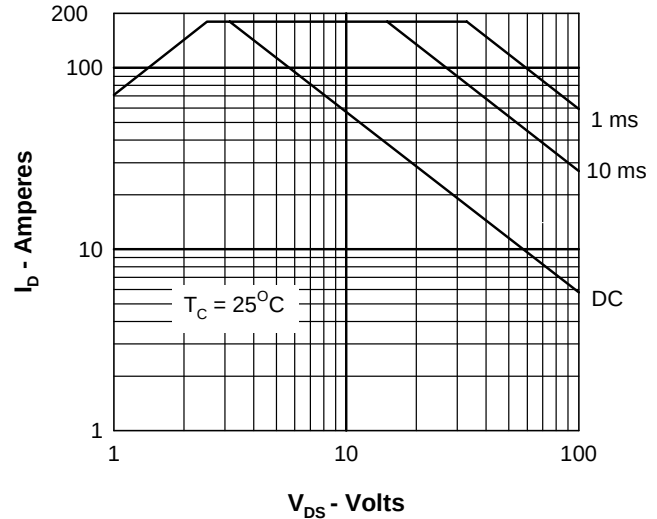


Figure 7. Gate Charge

Figure 8. Capacitance Curves

Figure 9. Forward Voltage Drop of the Intrinsic Diode

Figure 10. Forward Bias Safe Operating Area

Figure 11. Transient Thermal Resistance
