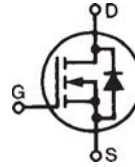


# HiPerFET™ Power MOSFET

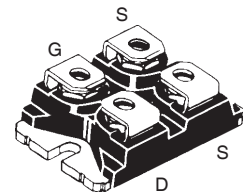
## IXFN38N100Q2

N-Channel Enhancement Mode  
Avalanche Rated, Low  $Q_g$ , Low Intrinsic  $R_g$   
High  $dV/dt$ , Low  $t_{rr}$

$V_{DSS} = 1000V$   
 $I_{D25} = 38A$   
 $R_{DS(on)} \leq 250m\Omega$   
 $t_{rr} \leq 300ns$



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

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	1000	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1 M\Omega$	1000	V
$V_{GSS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ C$	38	A
$I_{DM}$	$T_C = 25^\circ C$ , pulse width limited by $T_{JM}$	152	A
$I_{AR}$	$T_C = 25^\circ C$	38	A
$E_{AR}$	$T_C = 25^\circ C$	60	mJ
$E_{AS}$	$T_C = 25^\circ C$	5	J
$dv/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ C$	20	V/ns
$P_D$	$T_C = 25^\circ C$	890	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$V_{ISOL}$	50/60 Hz, RMS, $t = 1$ minute	2500	V
$M_d$	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque	1.5/11.5	Nm/lb.in.
<b>Weight</b>		30	g

### Features

- Double metal process for low gate resistance
- miniBLOC, with Aluminium nitride isolation
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

### Applications

- DC-DC converters
- Switched-mode and resonant-mode power supplies
- DC choppers
- Pulse generators

### Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ C$ , unless otherwise specified)		
		Min.	Typ.	Max.
$V_{DSS}$	$V_{GS} = 0V$ , $I_D = 1mA$	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8mA$	3.0		5.5 V
$I_{GSS}$	$V_{GS} = \pm 30V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 125^\circ C$			50 $\mu A$ 3 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1			250 m $\Omega$

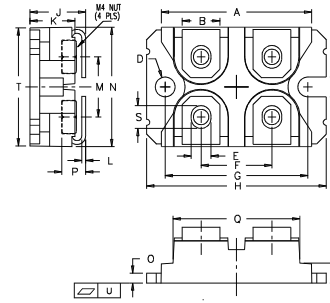
Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		Min.	Typ.	Max.
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 20V, I <sub>D</sub> = 0.5 • I <sub>D25</sub> Note 1	24	40	S
<b>C<sub>iss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25V, f = 1MHz		13.5	nF
<b>C<sub>oss</sub></b>			1035	pF
<b>C<sub>rss</sub></b>			180	pF
<b>t<sub>d(on)</sub></b>	<b>Resistive Switching Time</b> V <sub>GS</sub> = 10V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub> R <sub>G</sub> = 1Ω (External)		25	ns
<b>t<sub>r</sub></b>			28	ns
<b>t<sub>d(off)</sub></b>			57	ns
<b>t<sub>f</sub></b>			15	ns
<b>Q<sub>G(on)</sub></b>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub>		250	nC
<b>Q<sub>GS</sub></b>			60	nC
<b>Q<sub>GD</sub></b>			105	nC
<b>R<sub>thJC</sub></b>			0.14	°C/W
<b>R<sub>thCK</sub></b>		0.05		°C/W

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		Min.	Typ.	Max.
<b>I<sub>S</sub></b>	V <sub>GS</sub> = 0V			38 A
<b>I<sub>SM</sub></b>	Repetitive, pulse width limited by T <sub>JM</sub>			152 A
<b>V<sub>SD</sub></b>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0V, Note 1			1.5 V
<b>t<sub>rr</sub></b>	I <sub>F</sub> = 25A -di/dt = 100 A/μs V <sub>R</sub> = 100V			300 ns
<b>Q<sub>RM</sub></b>			1.4	μC
<b>I<sub>RM</sub></b>			9	A

Note: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %

### miniBLOC, SOT-227 B Outline



M4 screws (4x) supplied

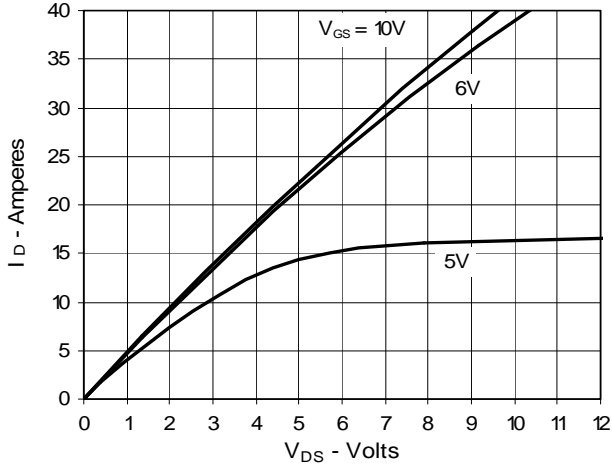
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	38.00	38.23	1.496	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	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

IXYS reserves the right to change limits, test conditions, and dimensions.

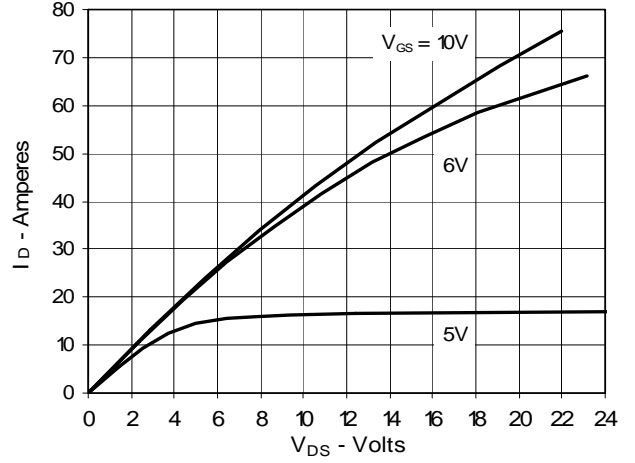
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065	B1	6,683,344	6,727,585	7,005,734	B2	7,157,338	B2
4,850,072	5,017,508	5,063,307	5,381,025	6,259,123	B1	6,534,343	6,710,405	B26	7,559,692	7,063,975	B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728	B1	6,583,505	6,710,463	6,771,478	B27	7,071,537		

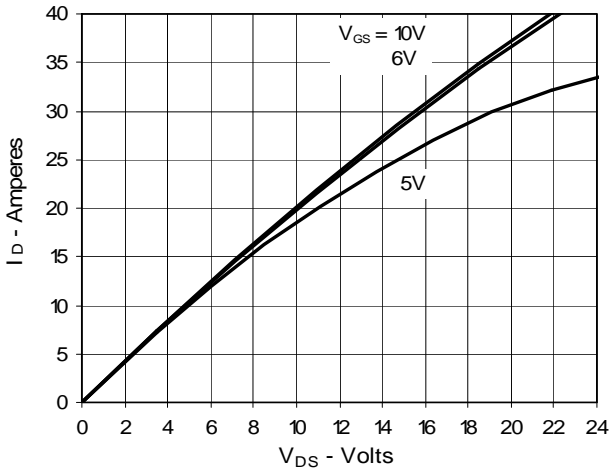
**Fig. 1. Output Characteristics  
@ 25°C**



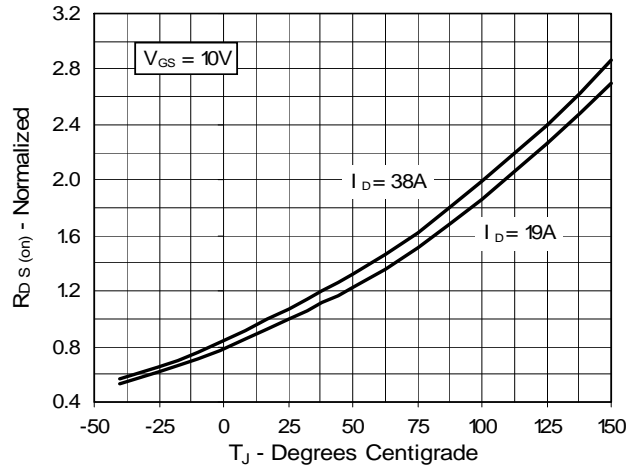
**Fig. 2. Extended Output Characteristics  
@ 25°C**



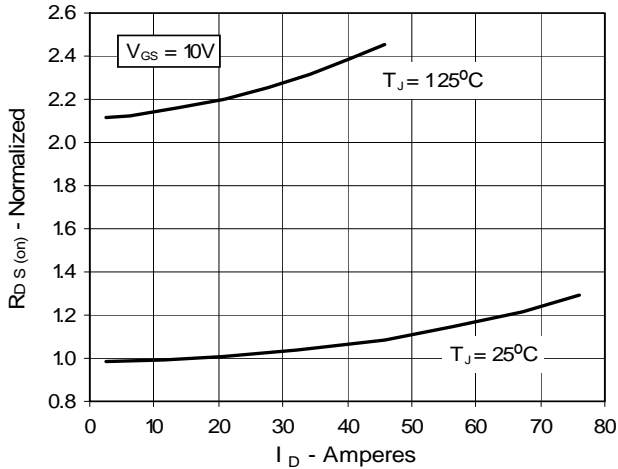
**Fig. 3. Output Characteristics  
@ 125°C**



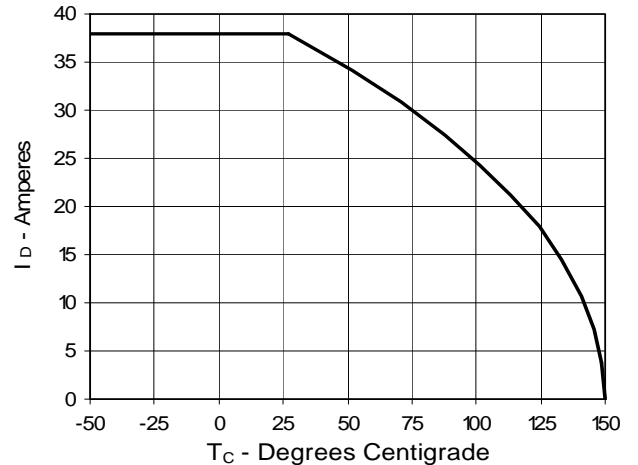
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 19A$   
Value vs. Junction Temperature**



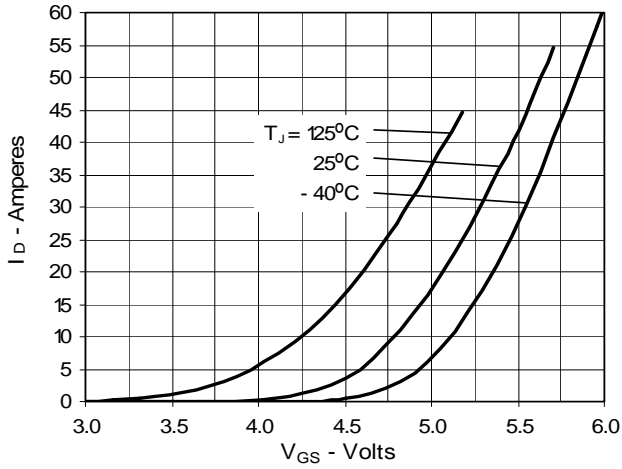
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 19A$   
Value vs. Drain Current**



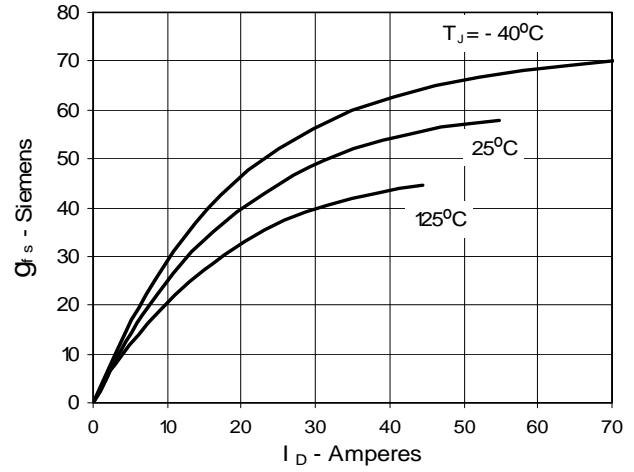
**Fig. 6. Drain Current vs.  
Case Temperature**



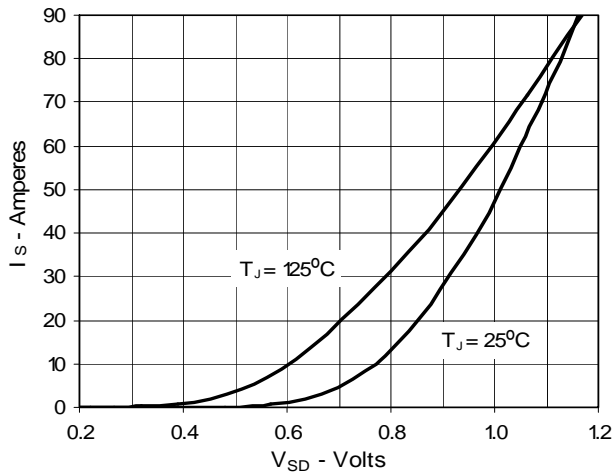
**Fig. 7. Input Admittance**



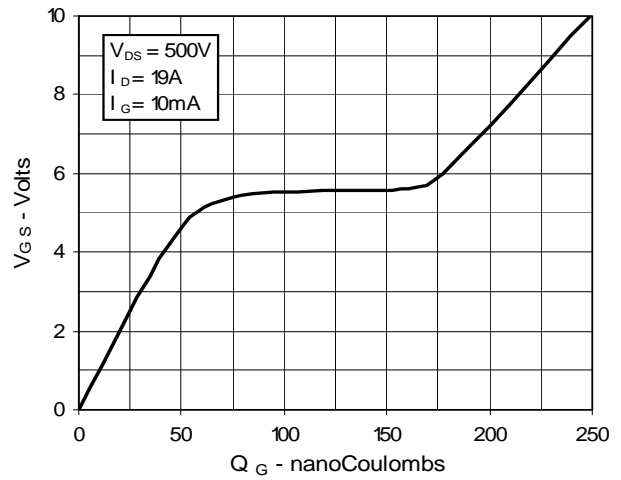
**Fig. 8. Transconductance**



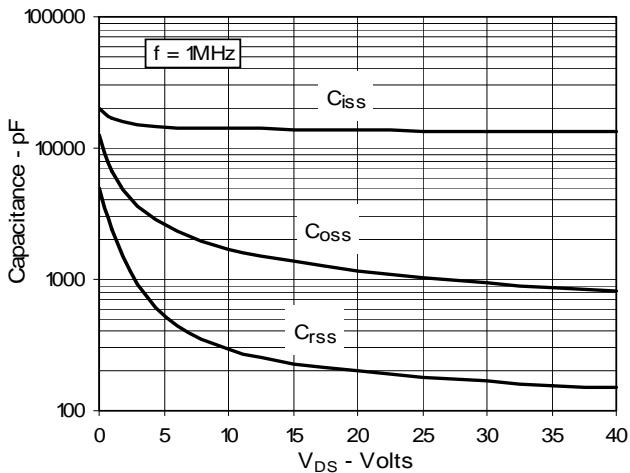
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Maximum Transient Thermal Impedance**

