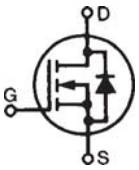
IXYS

HiPerFET™ Power MOSFET

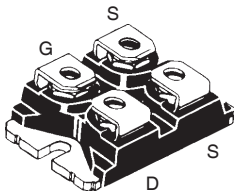
IXFN38N100Q2

V_{DSS} = 1000V
I_{D25} = 38A
$R_{DS(on)}$ ≤ 250mΩ
t_{rr} ≤ 300ns

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



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°C to 150°C	1000	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1 MΩ	1000	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	38	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	152	A
I_{AR}	T_C = 25°C	38	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	5	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	20	V/ns
P_D	T_C = 25°C	890	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°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.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (T_J = 25°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} = ±30V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$			50	μA
	V_{GS} = 0V, T_J = 125°C			3	mA
$R_{DS(on)}$	V_{GS} = 10V, $I_D = 0.5 \bullet I_{D25}$, Note 1			250	mΩ

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

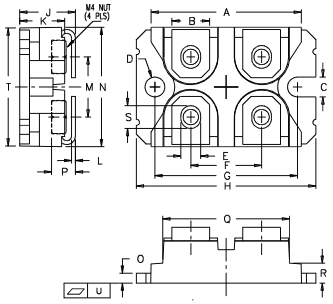
Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 0.5 • I_{D25} Note 1	24	40		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25V, f = 1MHz		13.5		nF
C_{oss}			1035		pF
C_{rss}			180		pF
$t_{d(on)}$	**Resistive Switching Time**		25		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		28		ns
$t_{d(off)}$	R_G = 1Ω (External)		57		ns
t_f			15		ns
$Q_{G(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		250		nC
Q_{GS}			60		nC
Q_{GD}			105		nC
R_{thJC}				0.14	°C/W
R_{thCK}			0.05		°C/W

Source-Drain Diode

Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			38	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			152	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 25A -di/dt = 100 A/µs V_R = 100V			300	ns
Q_{RM}			1.4		µC
I_{RM}			9		A

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

miniBLOC, SOT-227 B Outline



M4 screws (4x) supplied

Dim.	Millimeter Min.	Max.	Inches 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 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,306,728 B1 6,404,065 B1 6,259,123 B1 6,583,505 6,683,344 6,534,343 6,710,463 6,727,585 6,710,405 B2 6,771,478 B2 7,005,734 B2 6,759,692 7,157,338B2 7,063,975 B2 7,071,537

Fig. 1. Output Characteristics @ 25ºC

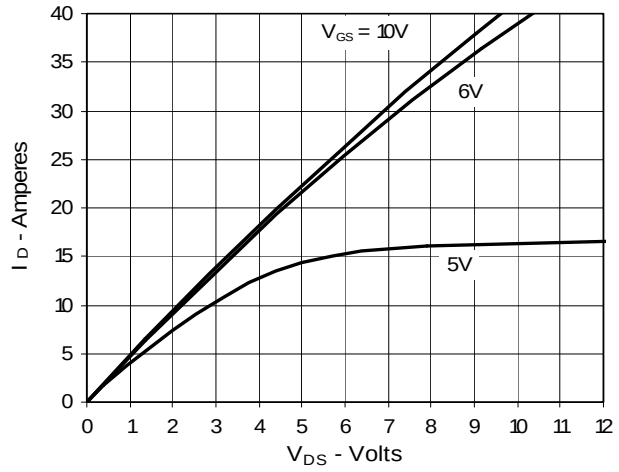


Fig. 2. Extended Output Characteristics @ 25ºC

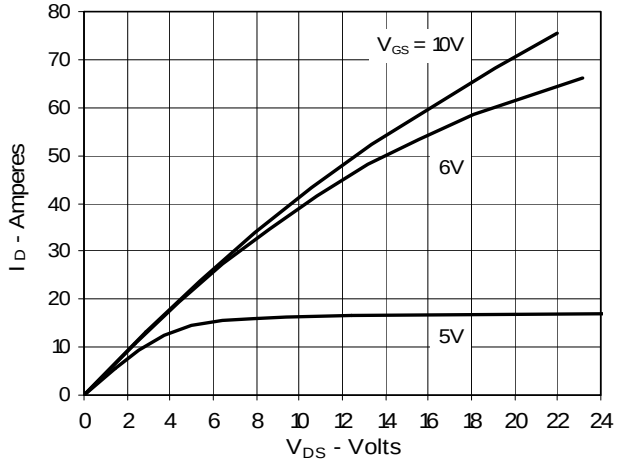


Fig. 3. Output Characteristics @ 125ºC

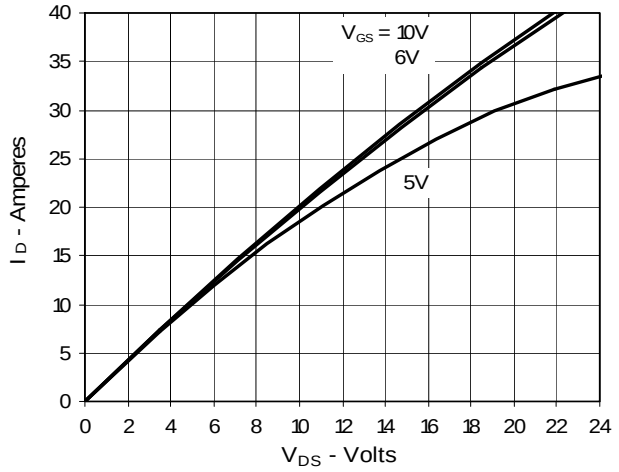


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 19A Value vs. Junction Temperature

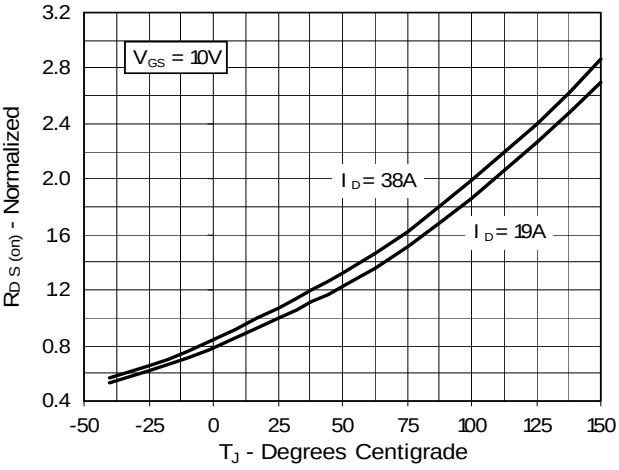


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 19A Value vs. Drain Current

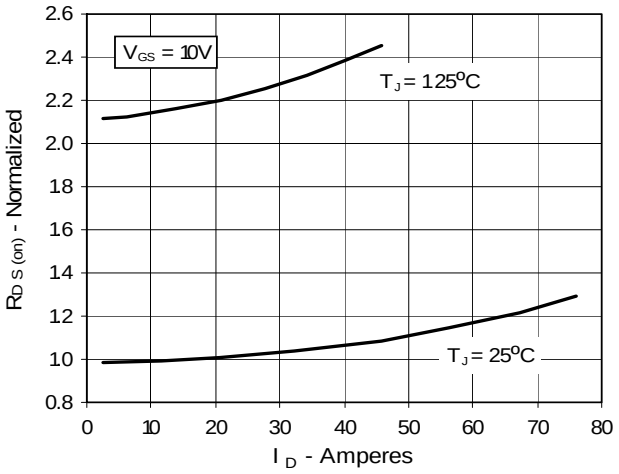


Fig. 6. Drain Current vs. Case Temperature

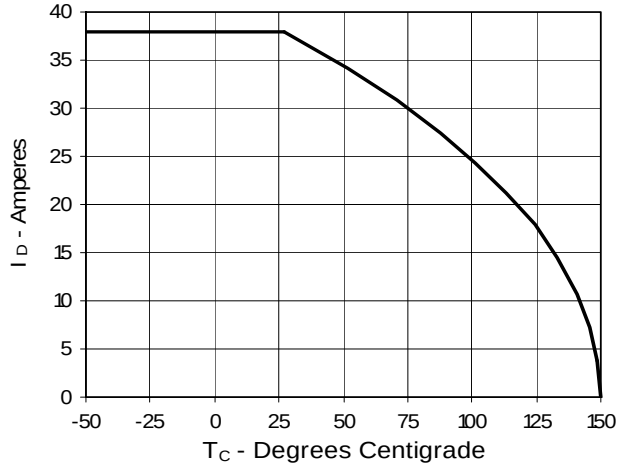


Fig. 7. Input Admittance

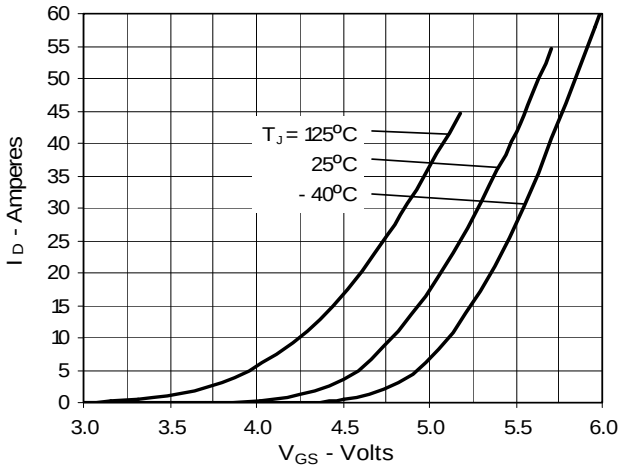


Fig. 8. Transconductance

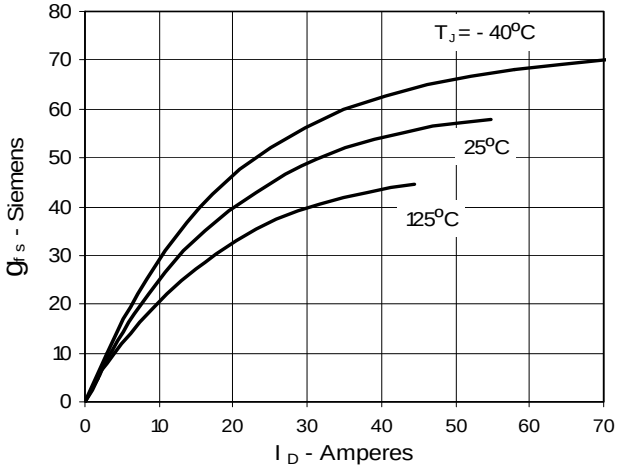


Fig. 9. Source Current vs. Source-To-Drain Voltage

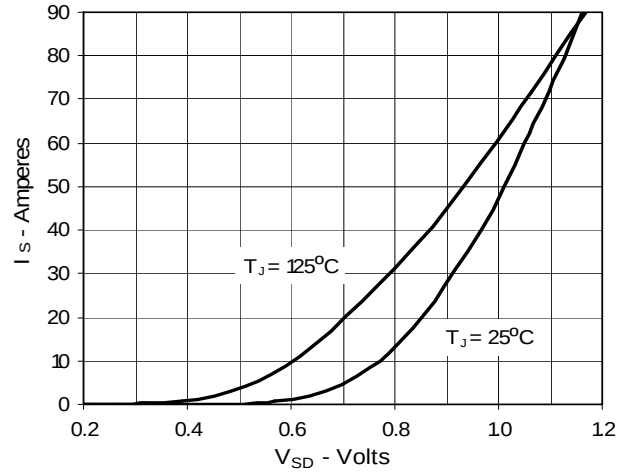


Fig. 10. Gate Charge

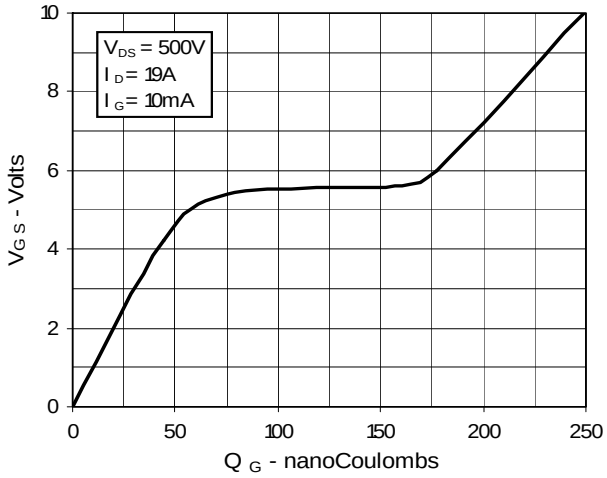


Fig. 11. Capacitance

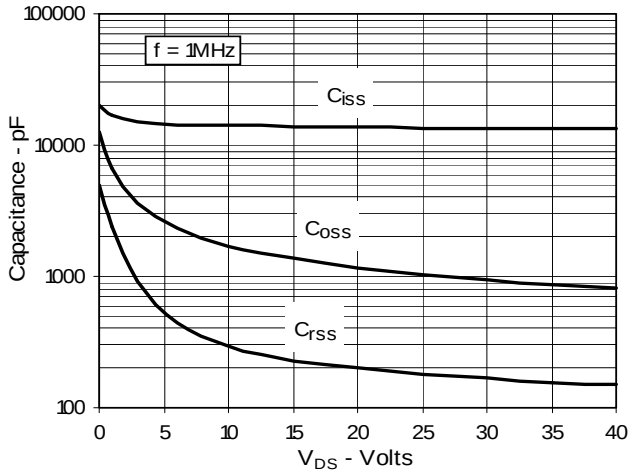


Fig. 12. Maximum Transient Thermal Impedance