IXYS

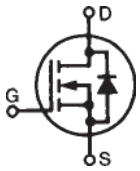
HiPerFET™ Power MOSFET

IXFN 70N60Q2

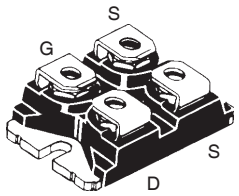
V_{DSS} = 600 V
I_{D25} = 70 A
$R_{DS(on)}$ = 80 mΩ
t_{rr} ≤ 250 ns

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

Preliminary Data Sheet



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	600	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	600	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	70	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	280	A
I_{AR}	T_C = 25°C	70	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	5.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$ $T_J \le 150°C$, R_G = 2 Ω	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	1.5/13	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} = 0 V, I_D = 1mA	600		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA	2.5		5.0 V
I_{GSS}	V_{GS} = ±30 V, V_{DS} = 0			±200 nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V	T_J = 25°C		50 µA
		T_J = 125°C		3 mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5 \bullet I_{D25}$ Note 1			80 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

© 2003 IXYS All rights reserved

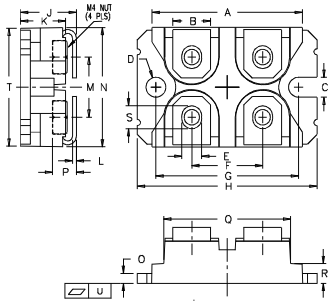
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 • I_{D25} Note 1	36	50		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		7200		pF
C_{oss}			1300		pF
C_{rss}			290		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 1 Ω (External)		26		ns
t_r			25		ns
$t_{d(off)}$			60		ns
t_f			12		ns
$Q_{G(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		265		nC
Q_{GS}			57		nC
Q_{GD}			120		nC
R_{thJC}				0.14	K/W
R_{thCK}			0.05		K/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
I_S	V_{GS} = 0 V			70	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			280	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 25A -di/dt = 100 A/µs V_R = 100 V			250	ns
Q_{RM}			1.2		µC
I_{RM}			8		A

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

miniBLOC, SOT-227 B Outline



M4 screws (4x) supplied

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343

Fig. 1. Output Characteristics @ 25 Deg. C

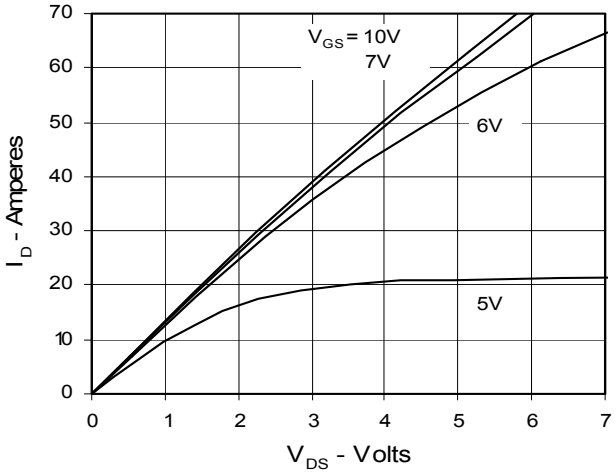


Fig. 2. Extended Output Characteristics @ 25 deg. C

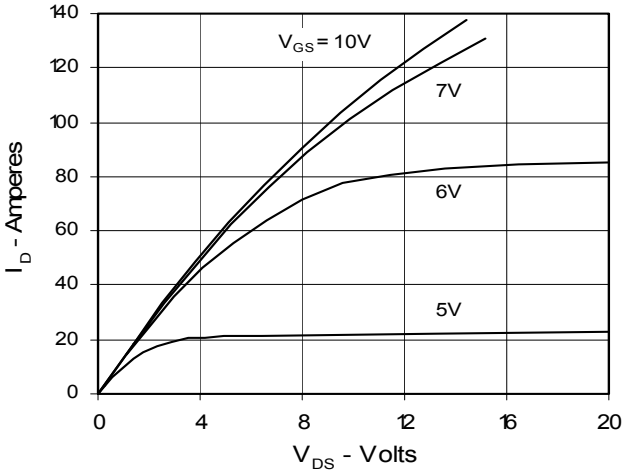


Fig. 3. Output Characteristics @ 125 Deg. C

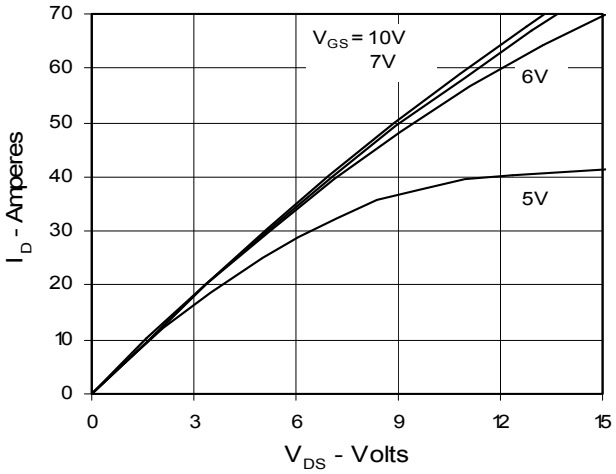


Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs. Junction Temperature

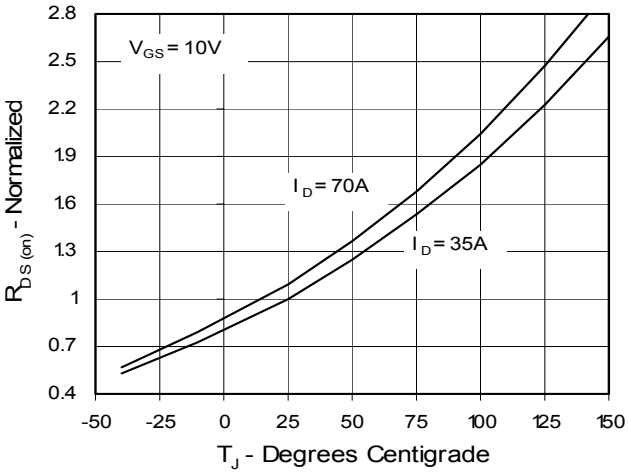


Fig. 5. $R_{DS(on)}$ Normalized to I_{D25} Value vs. I_D

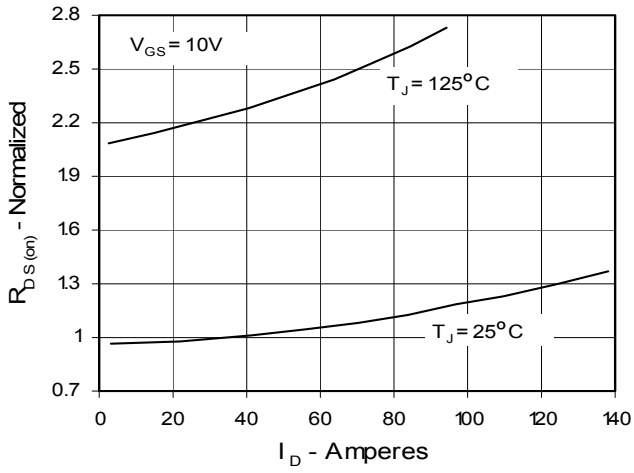
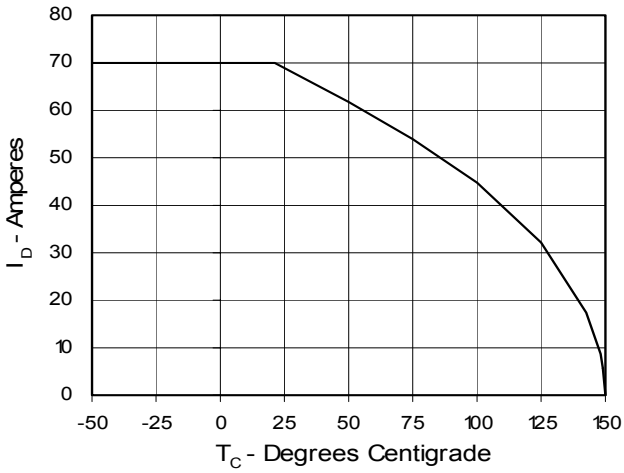


Fig. 6. Drain Current vs. Case Temperature



© 2003 IXYS All rights reserved

Fig. 7. Input Admittance

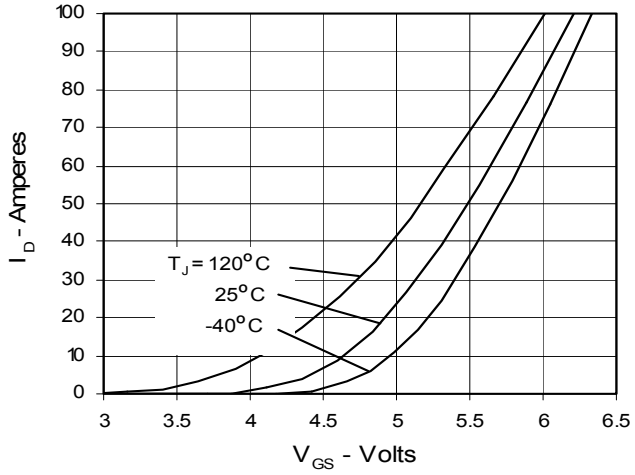


Fig. 8. Transconductance

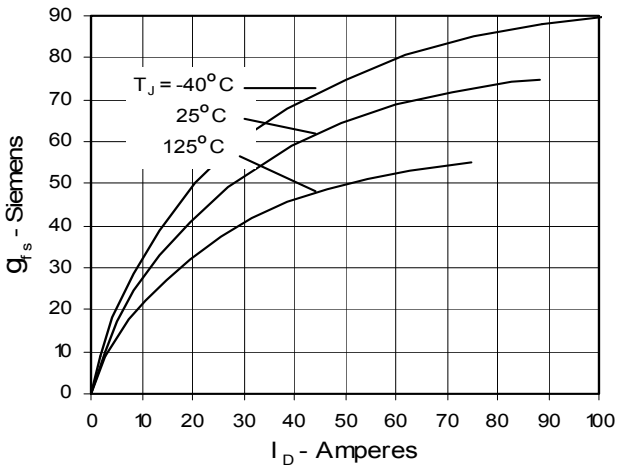


Fig. 9. Source Current vs. Source-To-Drain Voltage

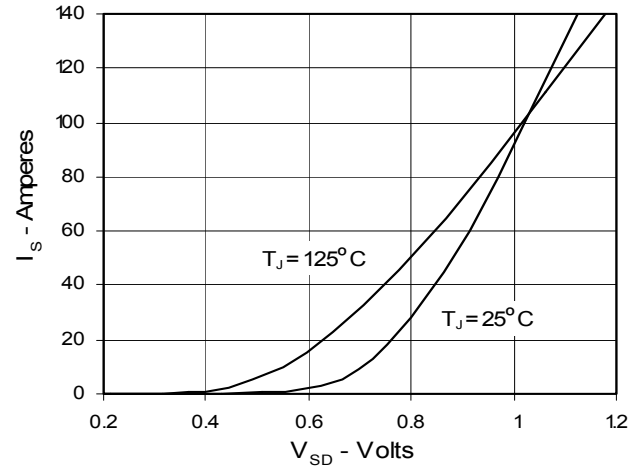


Fig. 10. Gate Charge

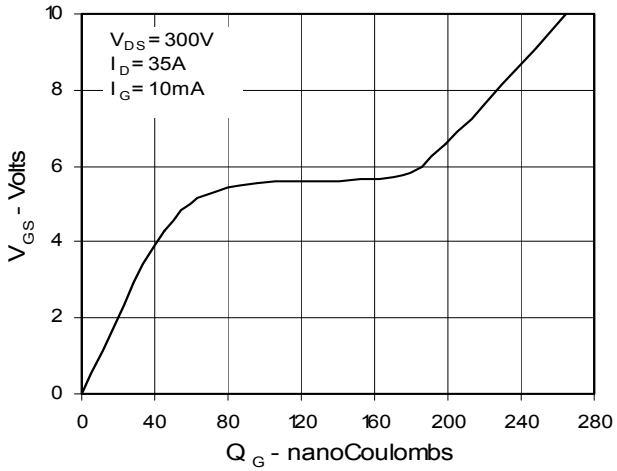


Fig. 11. Capacitance

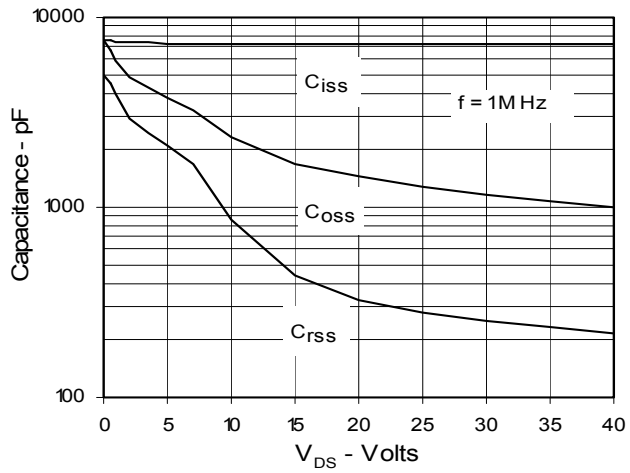
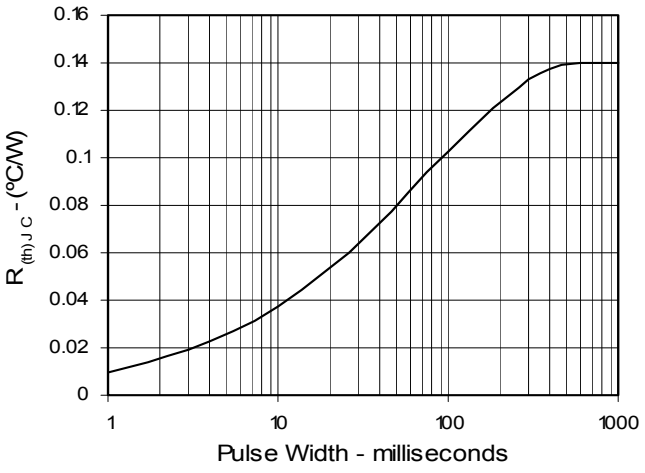


Fig. 12. Maximum Transient Thermal Resistance



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 5,486,715 5,381,025 6,306,728B1 6,404,065B1 6,259,123B1 6,162,665 6,306,728B1 6,534,343