IXYS

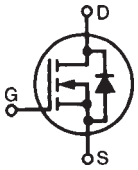
HiPerFET™ Power MOSFETs Q-Class

IXFN 44N50Q
IXFN 48N50Q

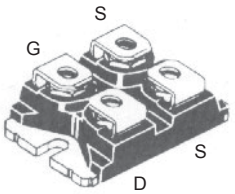
V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	44 A	120 mΩ
500 V	48 A	100 mΩ

$t_{rr} \leq 250$ ns

N-Channel Enhancement Mode
Avalanche Rated, Low Q_g, High dv/dt



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		500	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ		500	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	44N50	44	A
		48N50	48	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	44N50	176	A
		48N50	192	A
I_{AR}	T_C = 25°C		48	A
E_{AR}	T_C = 25°C		60	mJ
E_{AS}			2.5	mJ
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$, $T_J \leq 150$°C, R_G = 2 Ω		15	V/ns
P_D	T_C = 25°C		500	W
T_J			-55 to +150	°C
T_{JM}			150	°C
T_{stg}			-55 to +150	°C
V_{ISOL}	50/60 Hz, RMS t = 1 min		2500	V~
	$I_{ISOL} \leq$ 1 mA t = 1 s		3000	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 = 1 mA		500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4 mA		2.0		4.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$	T_J = 25°C			100	µA
	V_{GS} = 0 V	T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25}	44N50			120	Ω
		48N50			100	Ω
	Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %					

Features
- IXYS advanced low Q_g process
- Low gate charge and capacitances
  - easier to drive
  - faster switching
- Unclamped Inductive Switching (UIS) rated
- Low $R_{DS\ (on)}$
- Fast intrinsic diode
- International standard package
- miniBLOC with Aluminium nitride isolation for low thermal resistance
- Low terminal inductance (<10 nH) and stray capacitance to heatsink (<35pf)
- Molding epoxies meet UL 94 V-0 flammability classification

Applications
- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

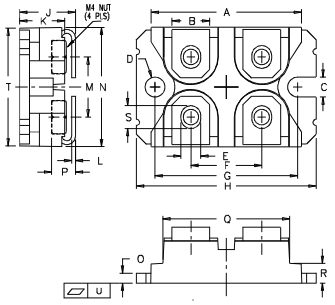
Advantages
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 20 V; I_D = 0.5 • I_{D25}, pulse test	30	42		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		7000		pF
C_{oss}			960		pF
C_{rss}			230		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 4.7 Ω (External),		33		ns
t_r			22		ns
$t_{d(off)}$			75		ns
t_f			10		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		190		nC
Q_{gs}			40		nC
Q_{gd}			86		nC
R_{thJC}				0.26	K/W
R_{thCK}			0.05		K/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			48	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			192	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			1.5	V
t_{rr}	I_F = 25A, -di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			1.0		µC
I_{RM}			10		A

miniBLOC, SOT-227 B



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.

Fig. 1. Output Characteristics @ 25 Deg. C

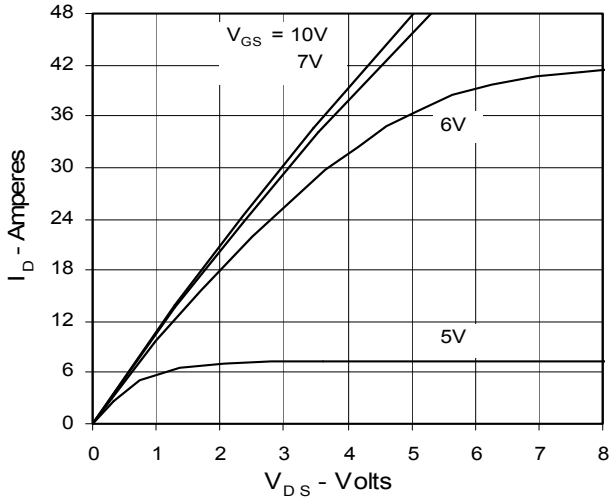


Fig. 2. Extended Output Characteristics @ 25 deg. C

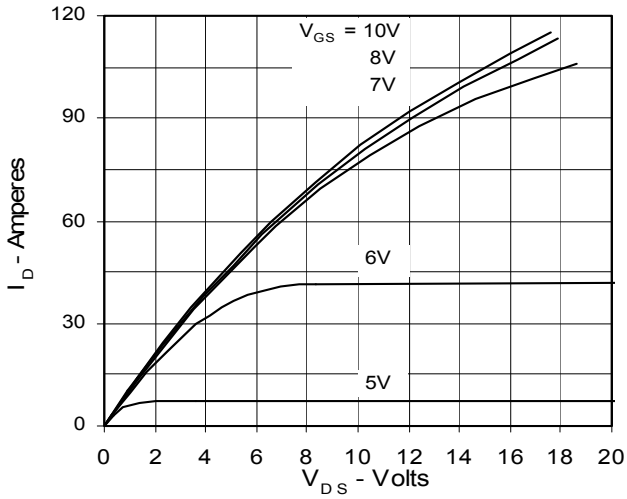


Fig. 3. Output Characteristics @ 125 Deg. C

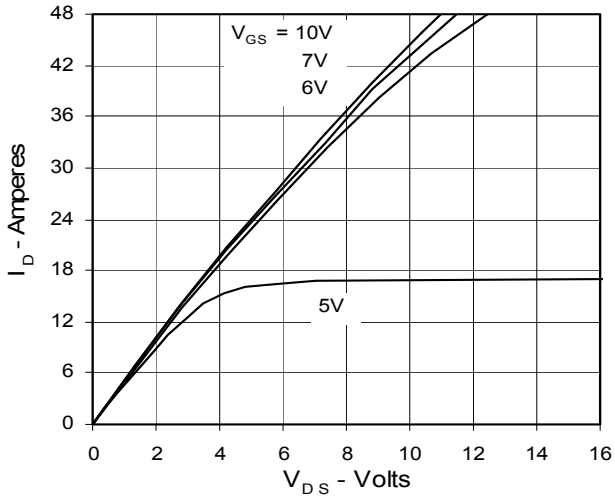


Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs. Junction Temperature

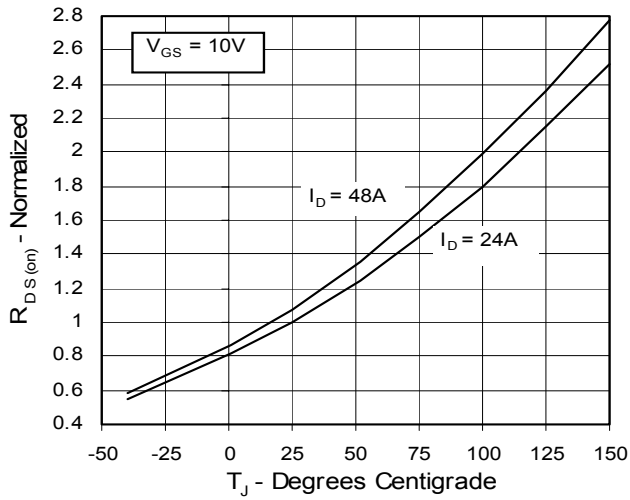


Fig. 5. $R_{DS(on)}$ Normalized to I_{D25} Value vs. I_D

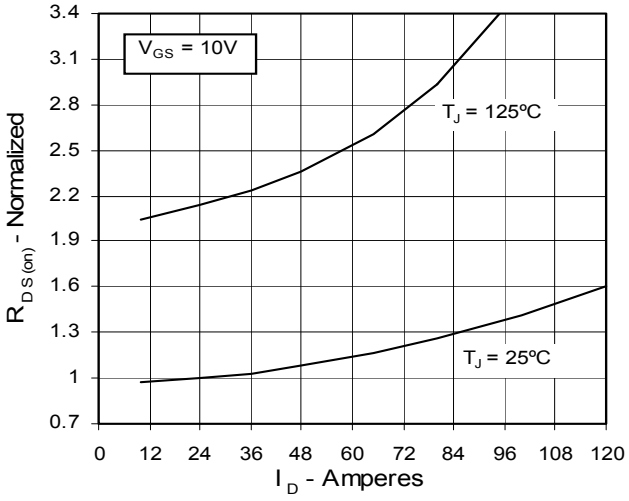


Fig. 6. Drain Current vs. Case Temperature

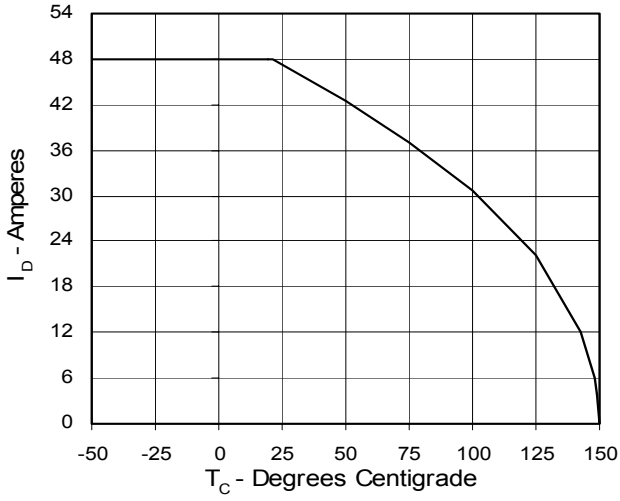


Fig. 7. Input Admittance

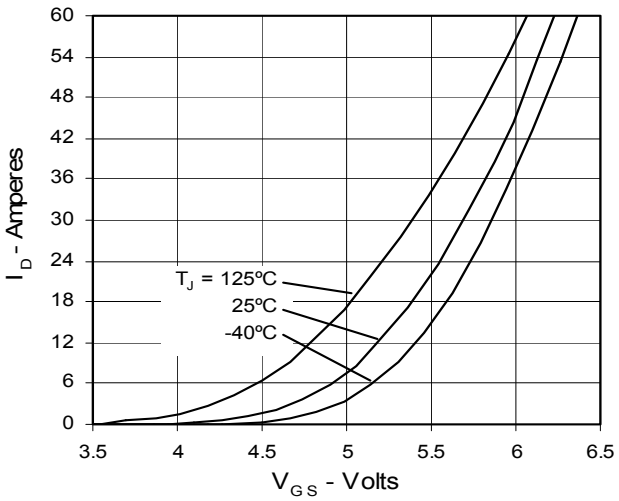


Fig. 8. Transconductance

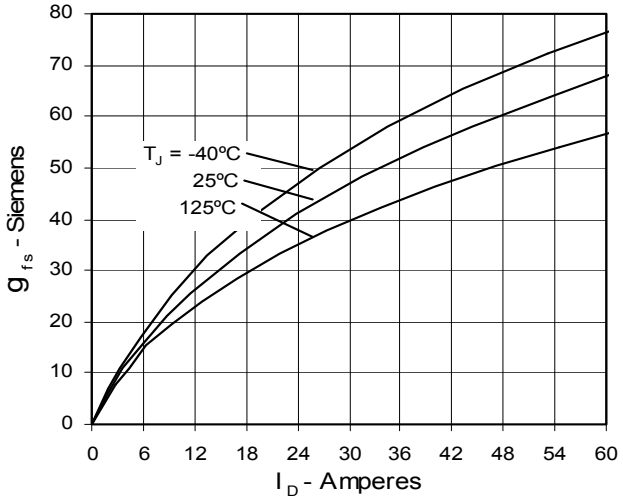


Fig. 9. Source Current vs. Source-To-Drain Voltage

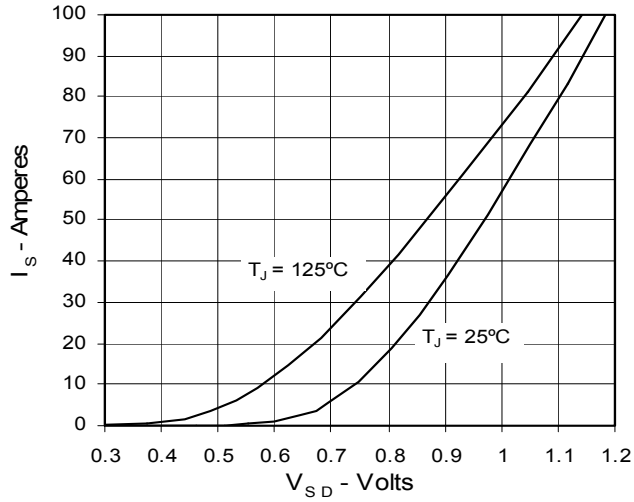


Fig. 10. Gate Charge

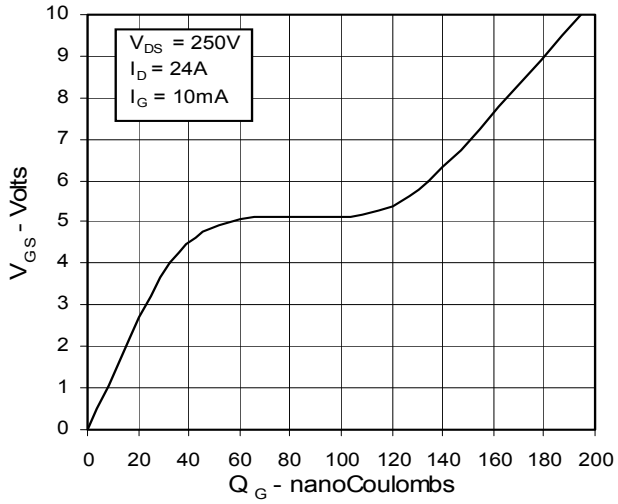


Fig. 11. Capacitance

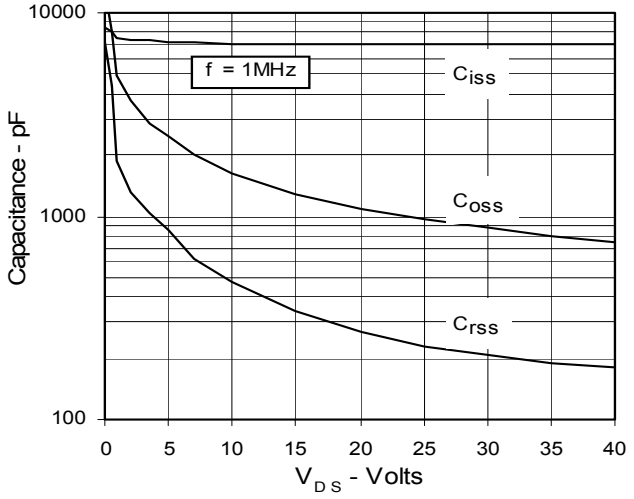
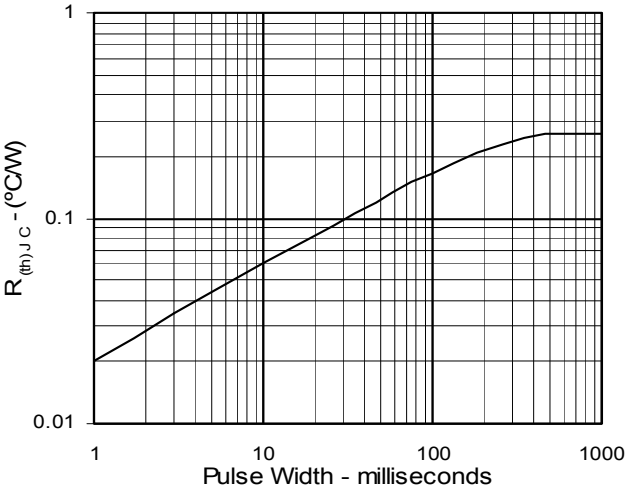


Fig. 12. Maximum Transient Thermal Resistance



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