IXYS

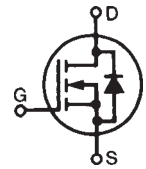
HiPerFET™ Power MOSFETs Q-Class

IXFE 44N50Q
IXFE 48N50Q

V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	39 A	120 mΩ
500 V	41 A	110 mΩ

$t_{rr} \leq 250$ ns

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

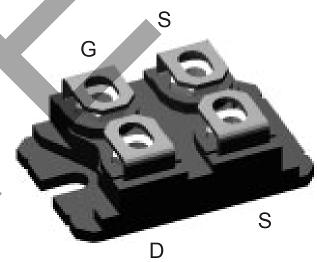


Preliminary data sheet

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	44N50Q 48N50Q	39 41	A A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	44N50Q 48N50Q	176 192	A A
I_{AR}	T_C = 25°C		48	A
E_{AR} E_{AS}	T_C = 25°C		60 2.5	mJ 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		400	W
T_J T_{JM} T_{stg}			-40 to +150 150 -40 to +150	°C °C °C
V_{ISOL}	50/60 Hz, RMS t = 1 min $I_{ISOL} \leq$ 1 mA t = 1 s		2500 3000	V~ V~
M_d	Mounting torque Terminal connection torque		1.5/13 1.5/13	Nm/lb.in. Nm/lb.in.
Weight			19	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} V_{GS} = 0 V	T_J = 25°C T_J = 125°C			100 2	µA mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = I_T Notes 1, 2	44N50Q 48N50Q			120 110	mΩ mΩ

ISOPLUS 227™ (IXFE)



G = Gate D = Drain
S = Source

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

Features
- Conforms to SOT-227B outline
- 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
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

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

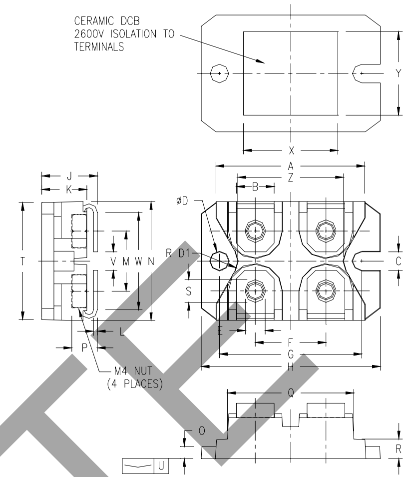
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 20 V; $I_D = I_T$, Notes 1, 2	30	42		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		7000		pF
C_{oss}			960		pF
C_{rss}			230		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, $I_D = I_T$ 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}, $I_D = I_T$		190		nC
Q_{gs}			40		nC
Q_{gd}			86		nC
R_{thJC}				0.31	K/W
R_{thCK}			0.07		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, Note:1			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

Note: 1. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %
2. I_T Test current:
44N50Q: I_T = 22A
48N50Q: I_T = 24A

ISOPLUS-227 B



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.240	1.270	31.50	32.26
B	.310	.330	7.87	8.38
C	.155	.165	3.94	4.19
D	.155	.165	3.94	4.19
D1	.150	.157	3.81	3.98
E	.160	.168	4.06	4.27
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.489	1.505	37.80	38.23
J	.465	.481	11.81	12.22
K	.370	.380	9.40	9.65
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.100	.105	2.54	2.67
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.160	.170	4.06	4.32
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.001	.002	-0.03	0.05
V	.130	.160	3.30	4.06
W	.780	.830	19.81	21.08
X	.770	.810	19.56	20.57
Y	.680	.720	17.27	18.29
Z	.885	.892	22.48	22.66

Fig. 1. Output Characteristics
@ 25 Deg. C

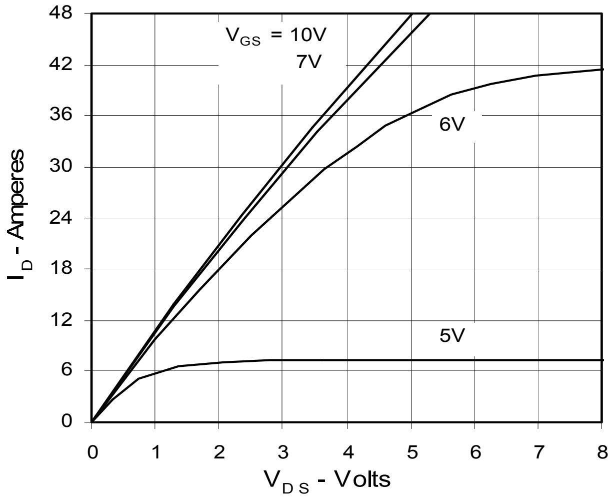


Fig. 2. Extended Output Characteristics
@ 25 deg. C

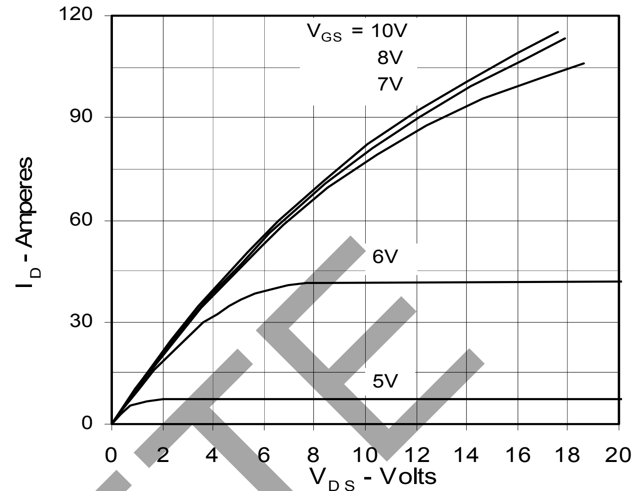


Fig. 3. Output Characteristics
@ 125 Deg. C

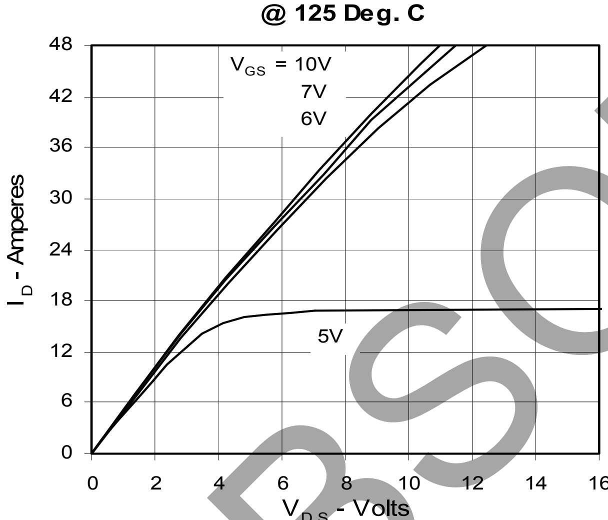


Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs. Junction Temperature

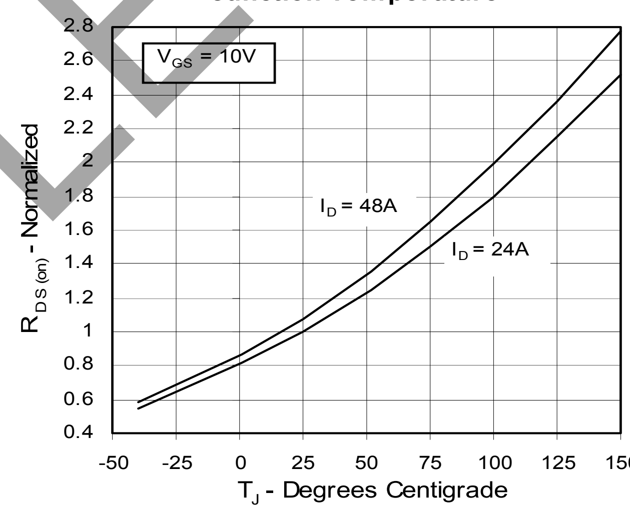


Fig. 5. $R_{DS(on)}$ Normalized to I_{D25} Value vs. I_D

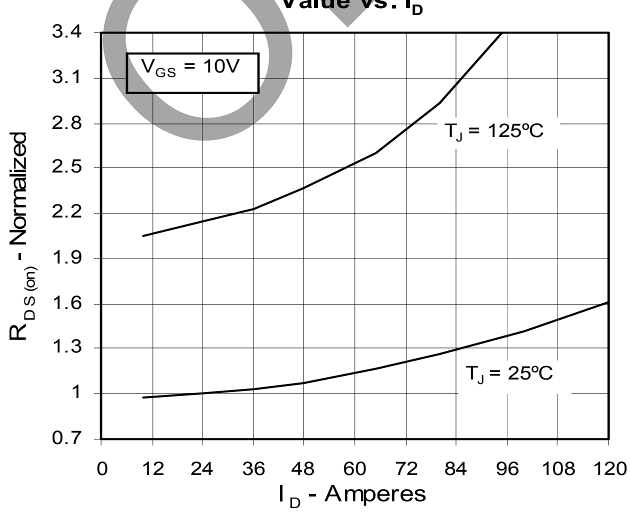


Fig. 6. Drain Current vs. Case Temperature

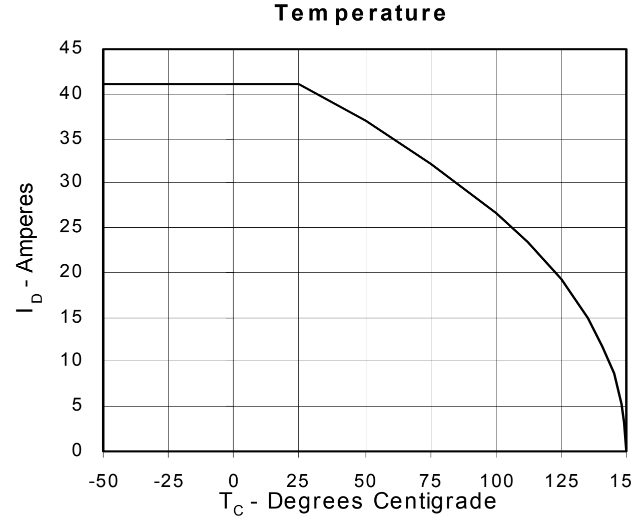


Fig. 7. Input Admittance

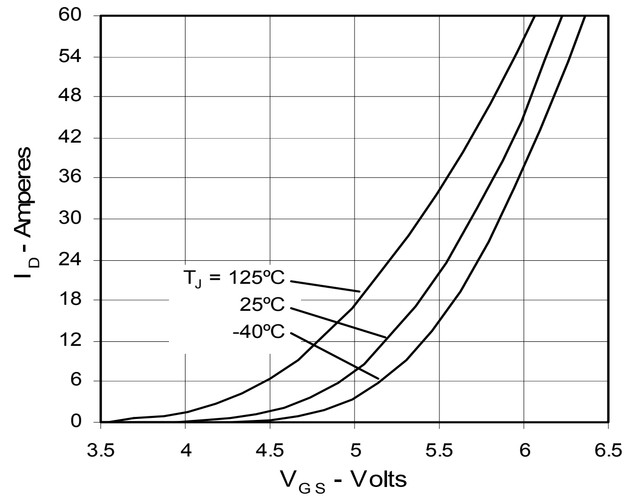


Fig. 8. Transconductance

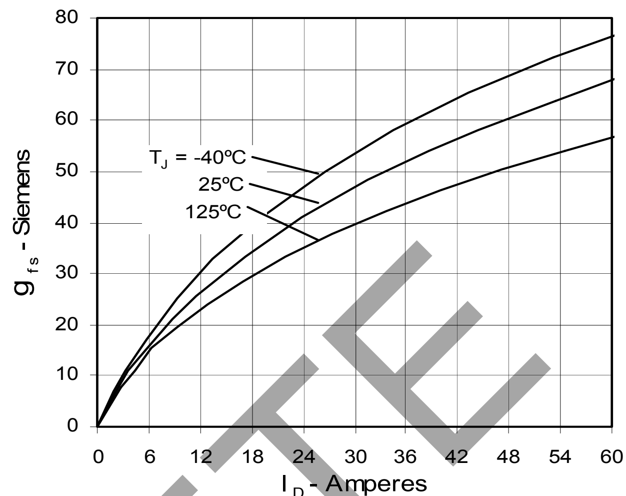


Fig. 9. Source Current vs. Source-To-Drain Voltage

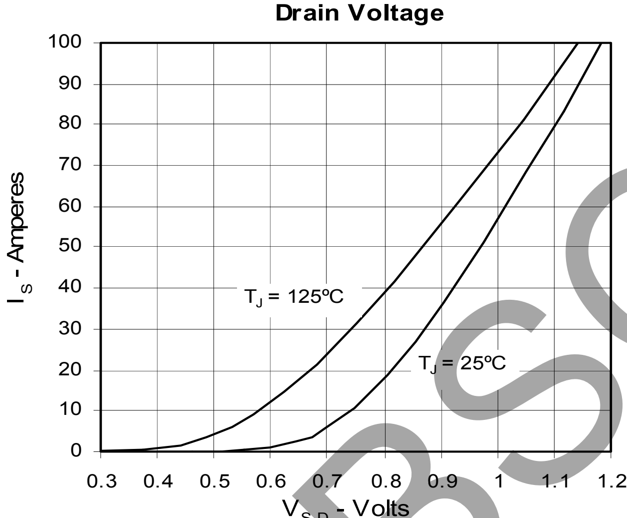


Fig. 10. Gate Charge

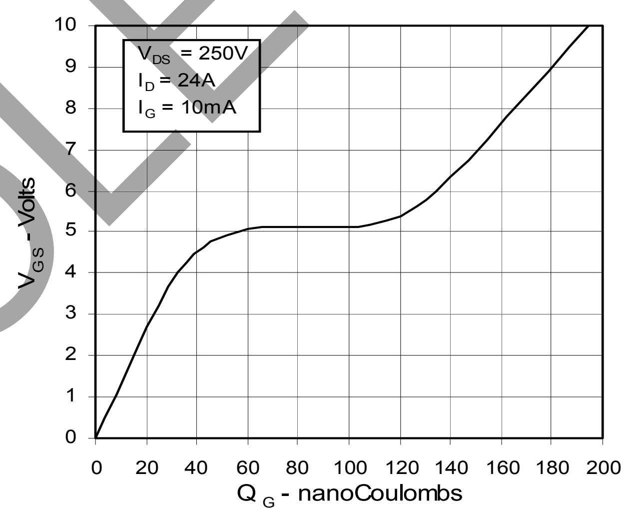


Fig. 11. Capacitance

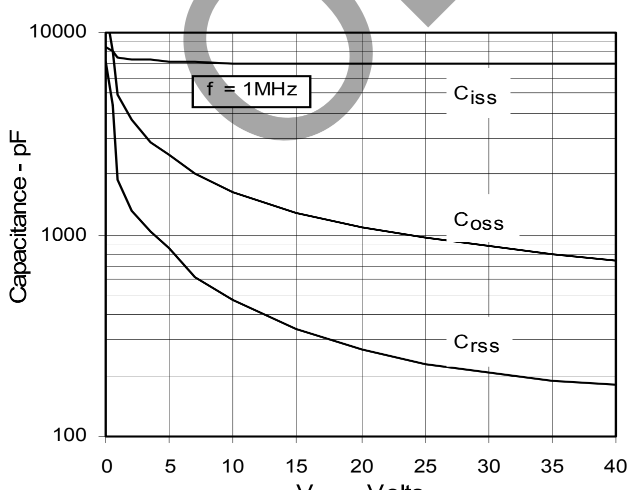
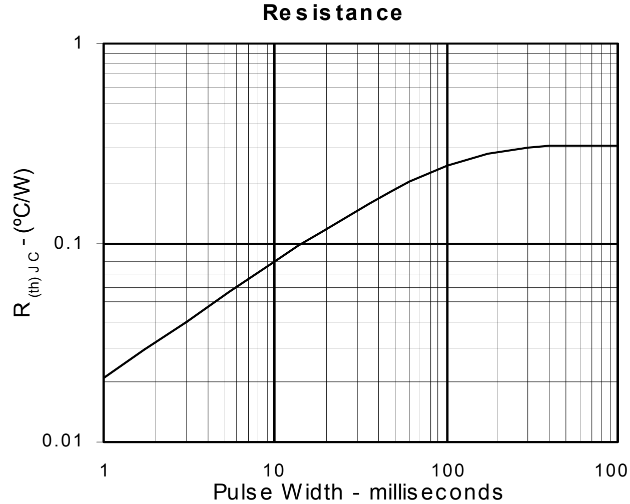


Fig. 12. Maximum Transient Thermal Resistance



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