

HiPerFET™

Power MOSFETs

ISOPLUS247™, Q-Class

IXFR 44N50Q

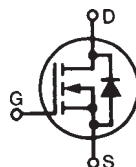
IXFR 48N50Q

V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	34 A	120 mΩ
500 V	40 A	110 mΩ

$t_{rr} \leq 250$ ns

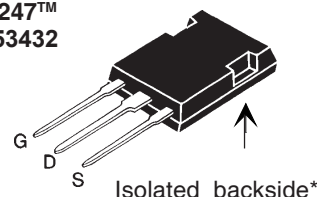
N-Channel Enhancement Mode

Avalanche Rated, Low Q_g , High dv/dt



Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500		V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ MΩ	500		V
V_{GS}	Continuous	±20		V
V_{GSM}	Transient	±30		V
I_{D25}	$T_C = 25^\circ\text{C}$	44N50Q	34	A
		48N50Q	40	A
I_{DM}	$T_C = 25^\circ\text{C}$, Note 1	44N50Q	176	A
		48N50Q	192	A
I_{AR}	$T_C = 25^\circ\text{C}$	44N50Q	44	A
		48N50Q	48	A
E_{AR}	$T_C = 25^\circ\text{C}$	60		mJ
E_{AS}	$T_C = 25^\circ\text{C}$	2.5		J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/μs, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω	15		V/ns
P_D	$T_C = 25^\circ\text{C}$	310		W
T_J		-55 ... +150		°C
T_{JM}		150		°C
T_{stg}		-55 ... +150		°C
T_L	1.6 mm (0.063 in.) from case for 10 s	300		°C
V_{ISOL}	50/60 Hz, RMS $t = 1$ min	2500		V~
Weight		5		g

ISOPLUS247™
E153432



G = Gate D = Drain
S = Source

* Patent pending

Features

- Silicon chip on Direct-Copper-Bond substrate
- High power dissipation
- Isolated mounting surface
- 2500V electrical isolation
- Low drain to tab capacitance(<30pF)
- IXYS advanced low Q_g process
- Rugged polysilicon gate cell structure
- Rated for Unclamped Inductive Load Switching (UIS)
- Fast intrinsic diode

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

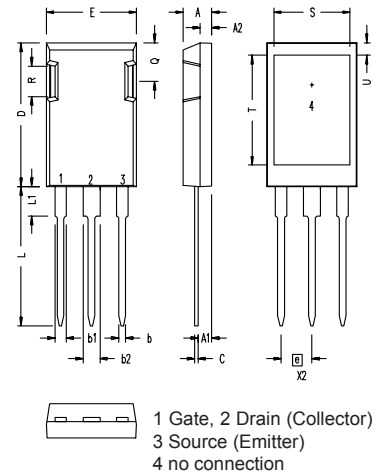
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 250$ μA	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4$ mA	2.0		4.0 V
I_{GSS}	$V_{GS} = \pm 20$ V, $V_{DS} = 0$			±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0$ V			100 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = I_T$ Notes 2, 3	44N50Q		120 mΩ
		48N50Q		110 mΩ

Symbol	Test Conditions		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
			min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = I_T$	Notes 2, 3	30	42	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$			7000	pF
C_{oss}				960	pF
C_{rss}				230	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External), Notes 2, 3			33	ns
t_r				22	ns
$t_{d(off)}$				75	ns
t_f				10	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ Notes 2, 3			190	nC
Q_{gs}				40	nC
Q_{gd}				86	nC
R_{thJC}				0.40	K/W
R_{thCK}				0.15	K/W

Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			48 A
I_{SM}	Repetitive; Note 1			192 A
V_{SD}	$I_F = I_T, V_{GS} = 0\text{ V}$, Notes 2, 3			1.5 V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250 ns
Q_{RM}				1.0 μC
I_{RM}				10 A

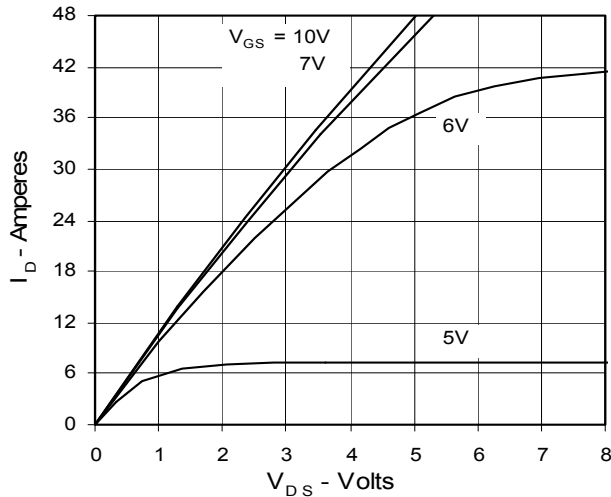
- Note: 1. Pulse width limited by T_{JM}
 2. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$
 3. IXFR44N50Q: $I_T = 22\text{ A}$
 IXFR48N50Q: $I_T = 24\text{ A}$

ISOPLUS 247 OUTLINE

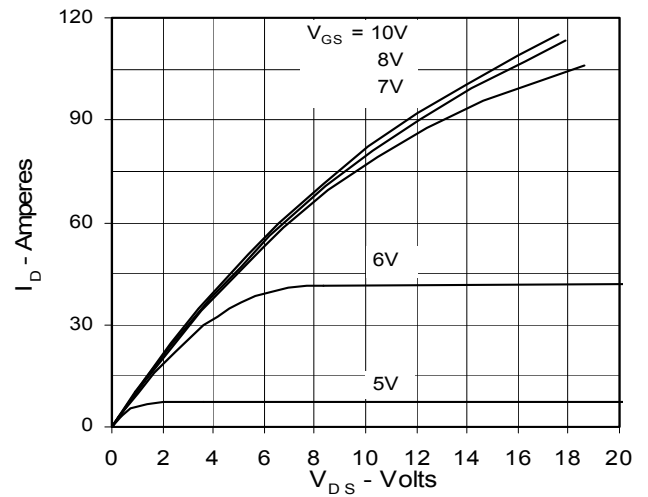


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

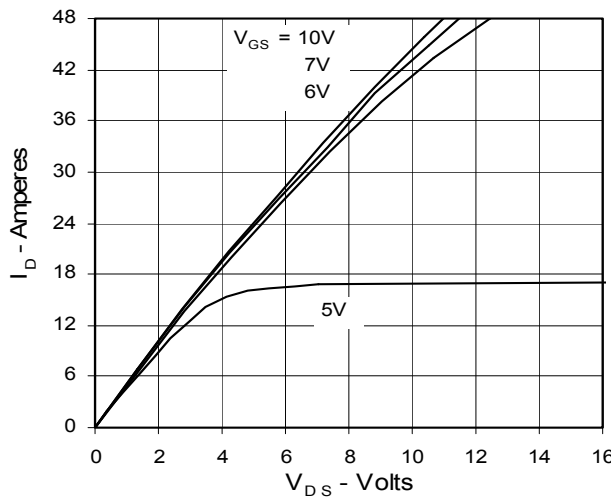
**Fig. 1. Output Characteristics
@ 25 Deg. C**



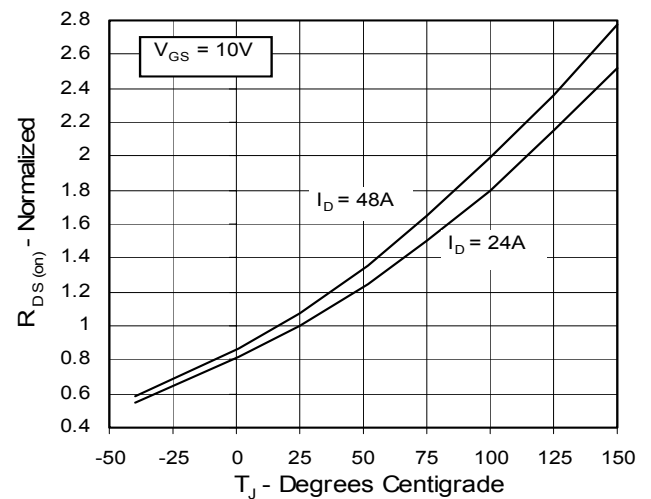
**Fig. 2. Extended Output Characteristics
@ 25 deg. C**



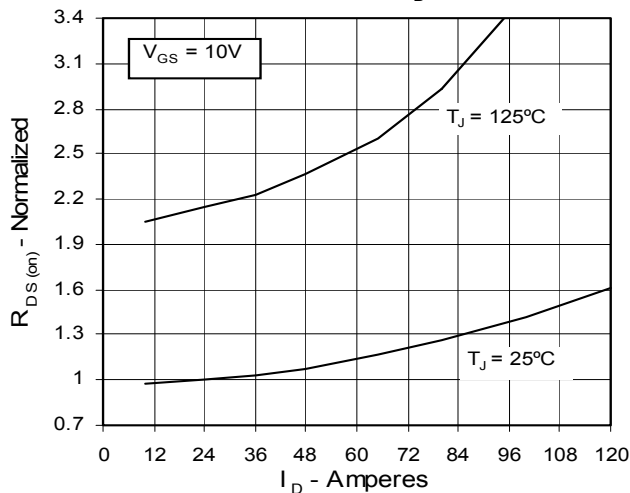
**Fig. 3. Output Characteristics
@ 125 Deg. C**



**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**

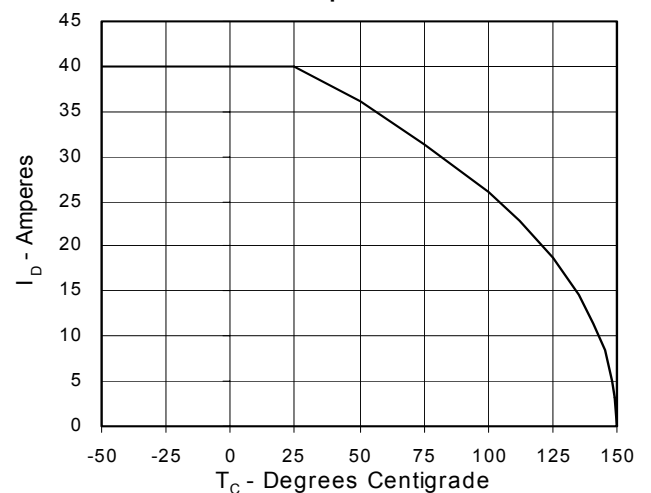


Fig. 7. Input Admittance

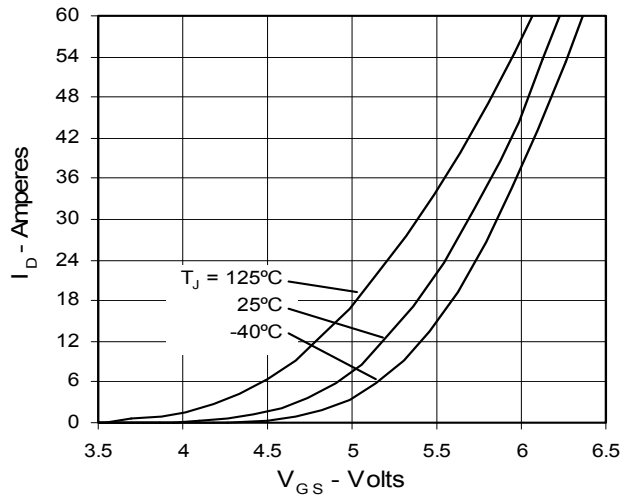


Fig. 8. Transconductance

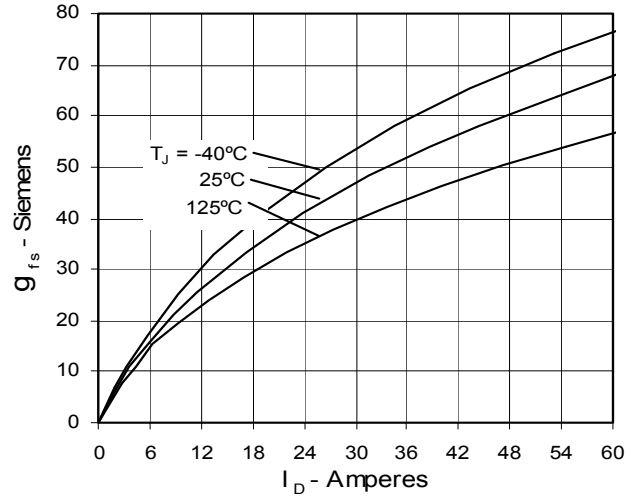


Fig. 9. Source Current vs. Source-To-Drain Voltage

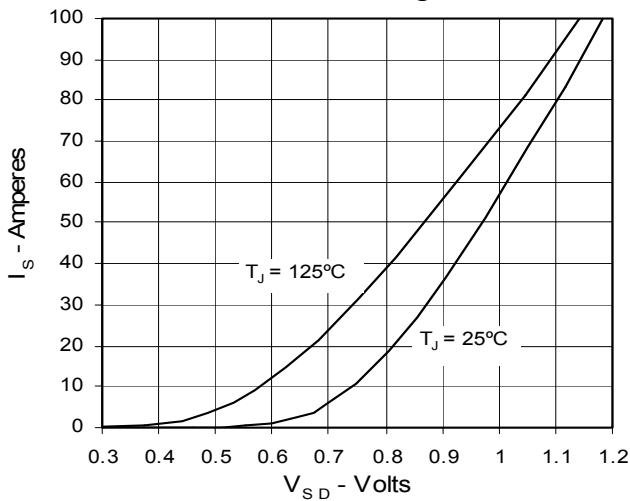


Fig. 10. Gate Charge

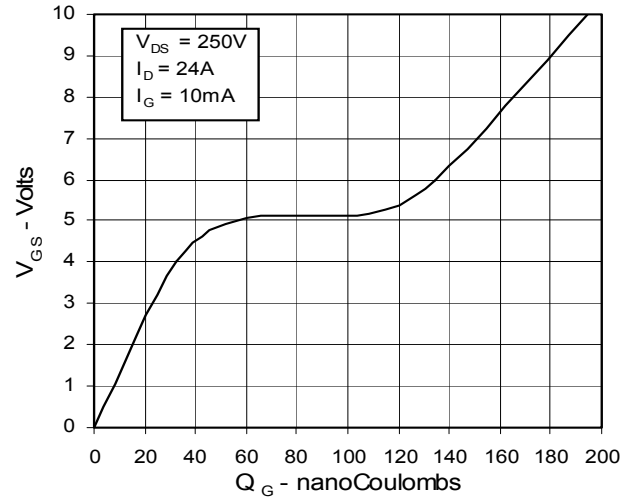


Fig. 11. Capacitance

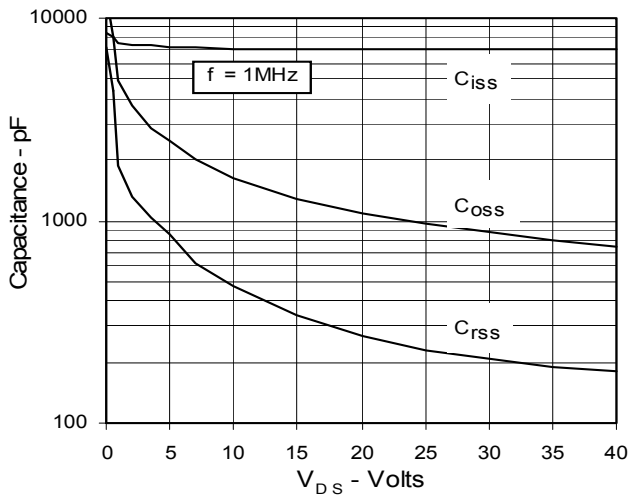
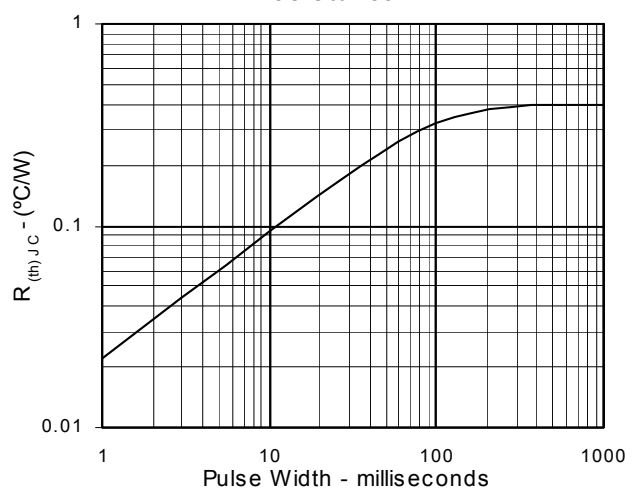


Fig. 12. Maximum Transient Thermal Resistance



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

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