

HiPerFET™

Power MOSFETs ISOPLUS247™, Q-Class

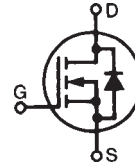
IXFR 44N50Q

IXFR 48N50Q

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

(Electrically Isolated Backside)

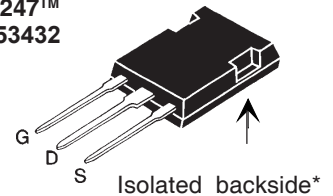
N-Channel Enhancement Mode
Avalanche Rated, Low Q_g , High dv/dt



$t_{rr} \leq 250$ ns

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	$^\circ\text{C}$	
T_{JM}		150	$^\circ\text{C}$	
T_{stg}		-55 ... +150	$^\circ\text{C}$	
T_L	1.6 mm (0.063 in.) from case for 10 s	300	$^\circ\text{C}$	
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

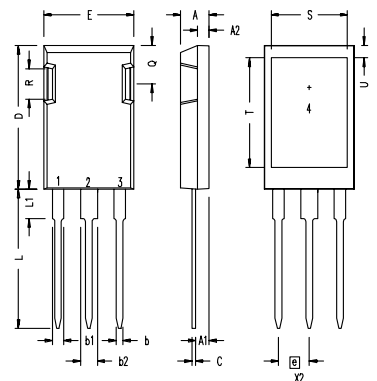
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 250$ μA	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4$ mA	2.0		4.0 V
I_{GSS}	$V_{GS} = \pm 20$ V, $V_{DS} = 0$			±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS}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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		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}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		1.0	250 ns
Q_{RM}				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



1 Gate, 2 Drain (Collector)
 3 Source (Emitter)
 4 no connection

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

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

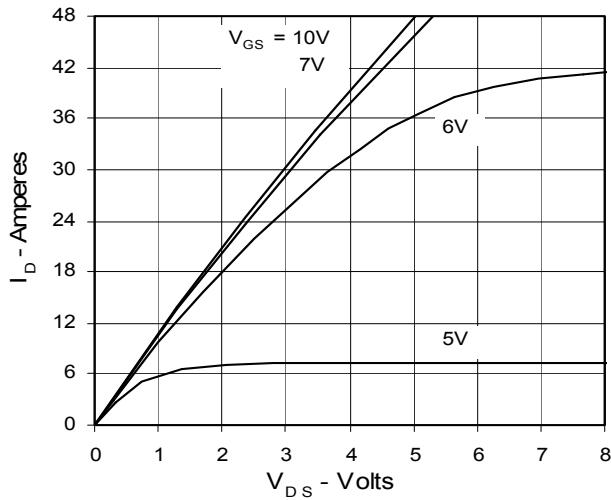


Fig. 2. Extended Output Characteristics @ 25 deg. C

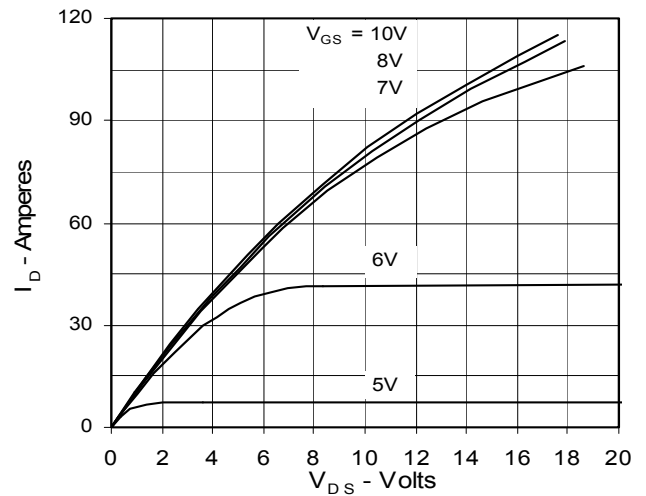


Fig. 3. Output Characteristics @ 125 Deg. C

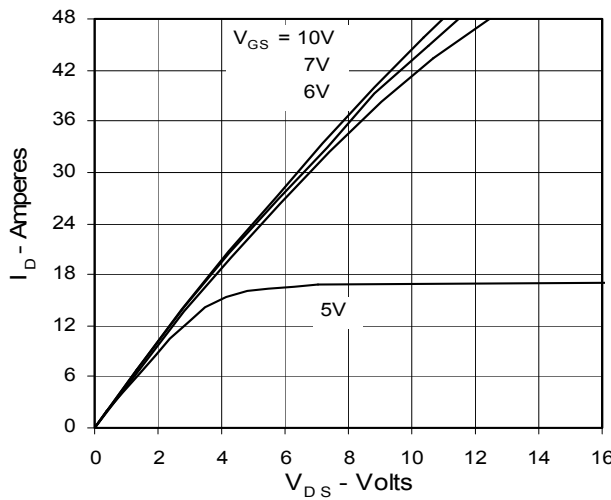


Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs. Junction Temperature

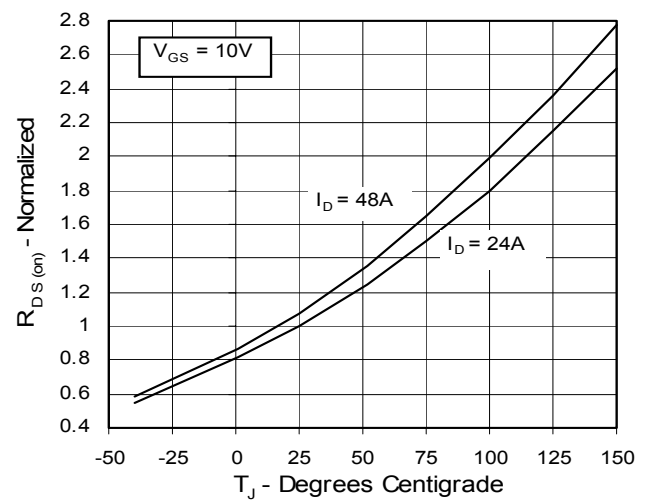


Fig. 5. $R_{DS(on)}$ Normalized to I_{D25} Value vs. I_D

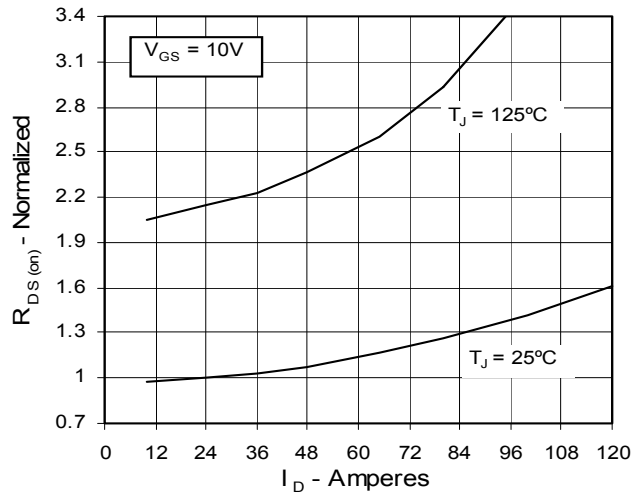


Fig. 6. Drain Current vs. Case Temperature

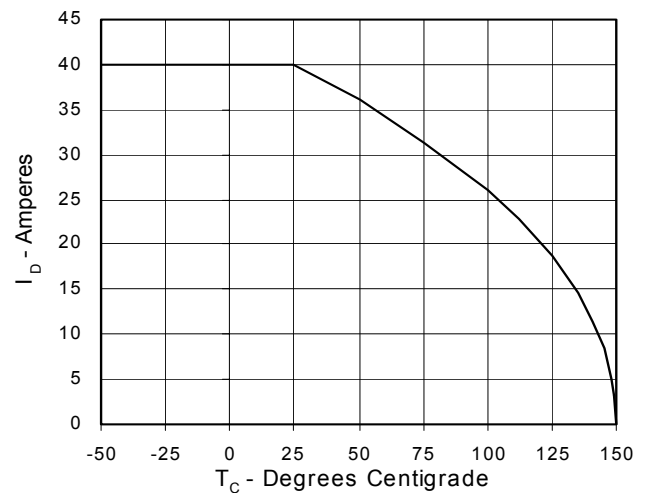


Fig. 7. Input Admittance

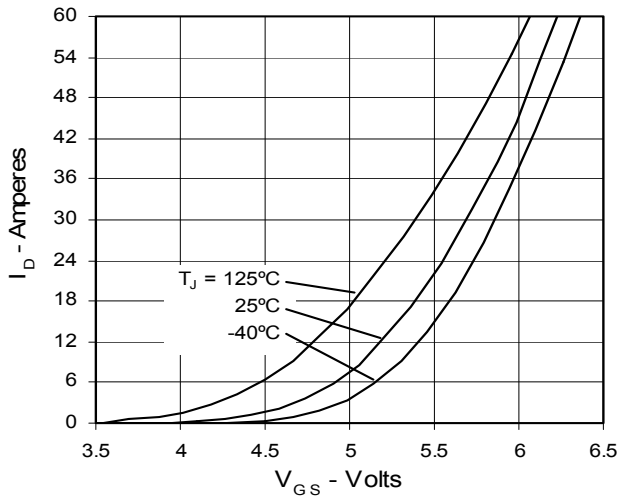


Fig. 8. Transconductance

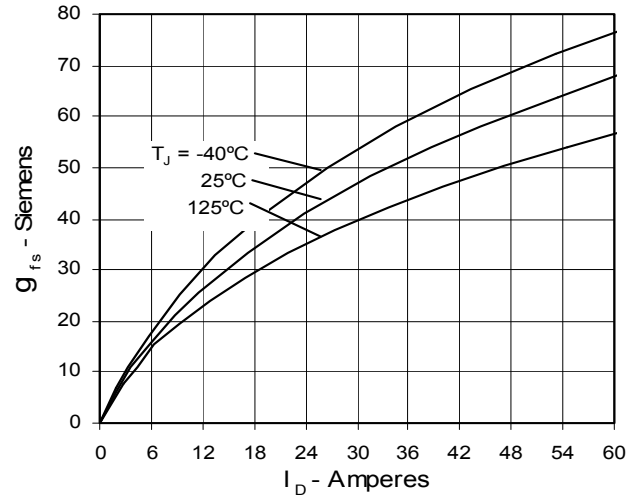


Fig. 9. Source Current vs. Source-To-Drain Voltage

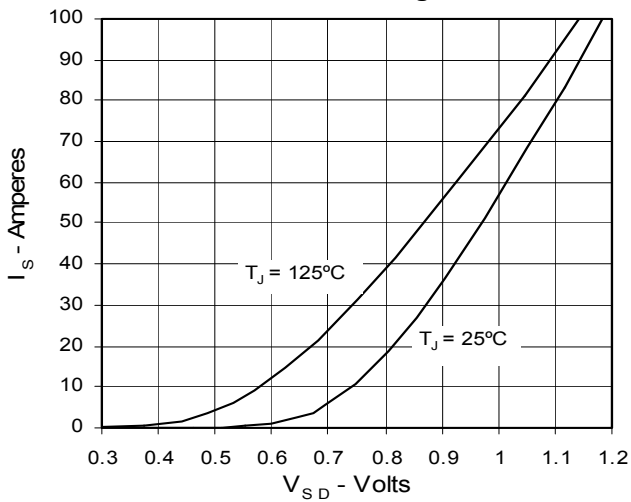


Fig. 10. Gate Charge

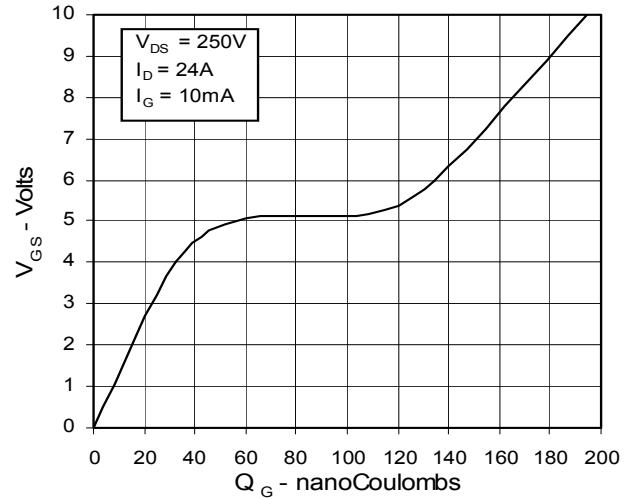


Fig. 11. Capacitance

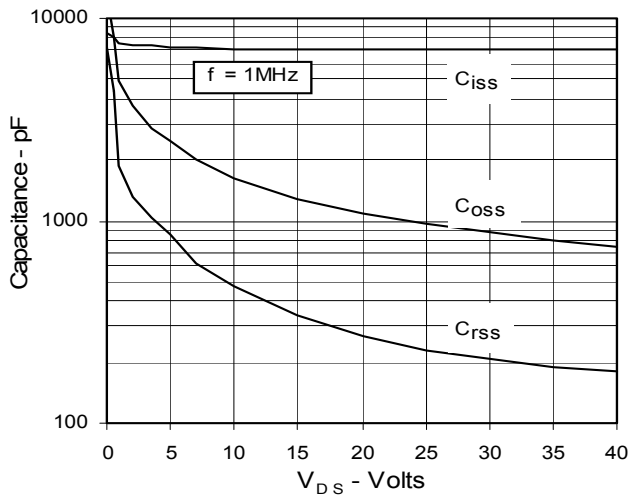
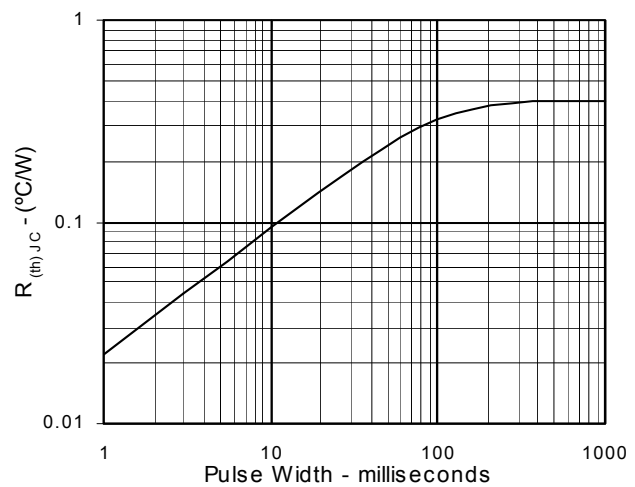


Fig. 12. Maximum Transient Thermal Resistance



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