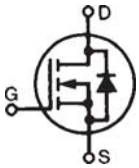
IXYS

HiPerFET™ Power MOSFET Q2-Class

IXFL80N50Q2

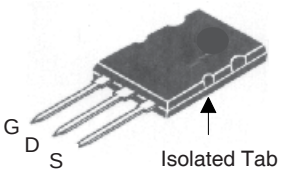
(Electrically Isolated Tab)

V_{DSS}	=	500V
I_{D25}	=	55A
$R_{DS(on)}$	≤	66mΩ
t_{rr}	≤	250ns



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

ISOPLUS264™(IXFL)



G = Gate D = Drain
S = 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} = 1MΩ	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25°C	55	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	320	A
I_A	T_C = 25°C	80	A
E_{AS}	T_C = 25°C	5	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le$ 150°C	20	V/ns
P_D	T_C = 25°C	380	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 10s	300	°C
T_{SOLD}	Plastic body for 10s	260	°C
F_C	Mounting force	30..120/6.7..27	N/lbs
V_{ISOL}	50/60 Hz, RMS t = 1 min	2500	V~
	$I_{ISOL} \le$ 1 mA t = 1 s	3000	V~
Weight		10	g

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 1mA	500			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8mA	3.0		5.5	V
I_{GSS}	V_{GS} = ±30 V, V_{DS} = 0V			± 200	nA
I_{DSS}	V_{DS} = V_{DSS}			100	μA
	V_{GS} = 0V T_J = 125°C			5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 40A, Note 1			66	mΩ

Features

- Electrically isolated mounting tab
- Double metal process for low gate resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance - easy to drive and to protect
- Fast intrinsic diode

Applications

- DC-DC converters
- Switched-mode and resonant-mode power supplies
- DC choppers
- Pulse generation
- Laser drivers

Advantages

- 2500 V~ Electrical isolation
- ISOPLUS 264™ package for clip or spring mounting
- Space savings
- High power density

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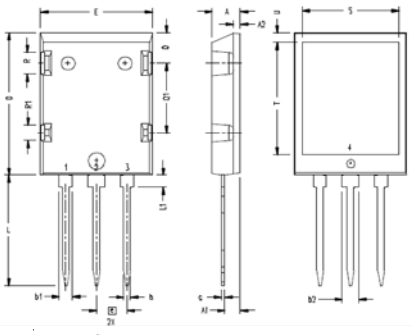
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 40A, Note 1	50	65		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		12.8		nF
C_{oss}			1640		pF
C_{rss}			440		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 40A R_G = 1Ω (External)		29		ns
t_r			25		ns
$t_{d(off)}$			60		ns
t_f			11		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 40A		250		nC
Q_{gs}			80		nC
Q_{gd}			120		nC
R_{thJC}				0.33	°C/W
R_{thCS}			0.15		°C/W

ISOPLUS264™ (IXFL) Outline



Note: Bottom heatsink meets

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.055	1.17	1.40
b	.045	.055	1.14	1.40
b1	.087	.102	2.21	2.59
b2	.111	.126	2.82	3.20
c	.020	.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	.770	.799	19.56	20.29
e	.215 BSC		5.46 BSC	
L	.780	.820	19.81	20.83
L1	.080	.102	2.03	2.59
Q	.210	.235	5.33	5.97
Q1	.490	.513	12.45	13.03
R	.150	.180	3.81	4.57
R1	.100	.130	2.54	3.30
S	.668	.690	16.97	17.53
T	.801	.821	20.34	20.85
U	.065	.080	1.65	2.03

Ref: IXYS CO 0128

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			80	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			320	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 25A, V_{GS} = 0V -di/dt = 100 A/μs V_R = 100 V			250	ns
Q_{RM}			1.4		μC
I_{RM}			12		A

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

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 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

Fig. 1. Output Characteristics @ 25ºC

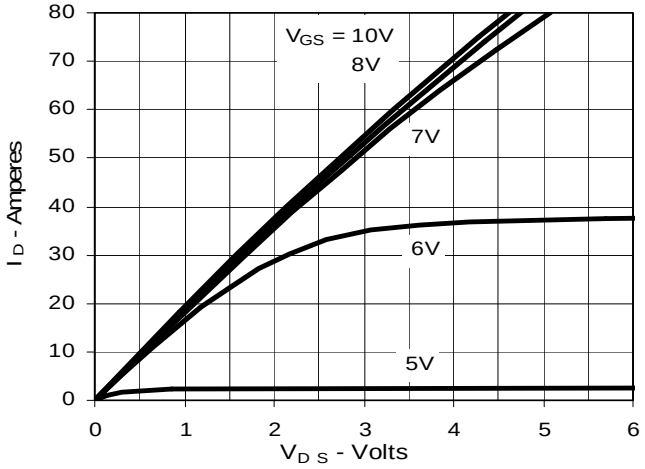


Fig. 2. Extended Output Characteristics @ 25ºC

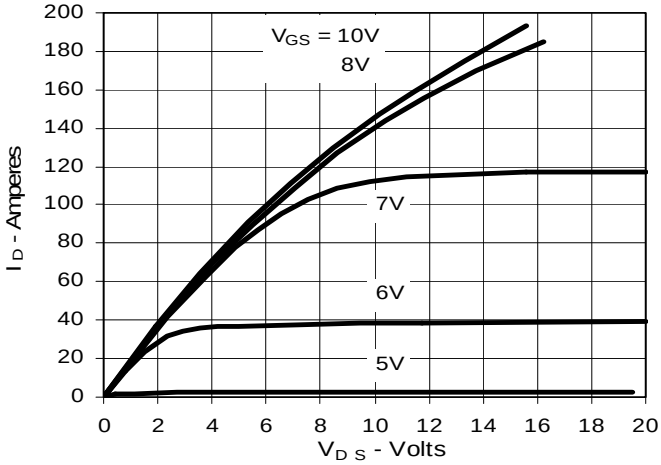


Fig. 3. Output Characteristics @ 125ºC

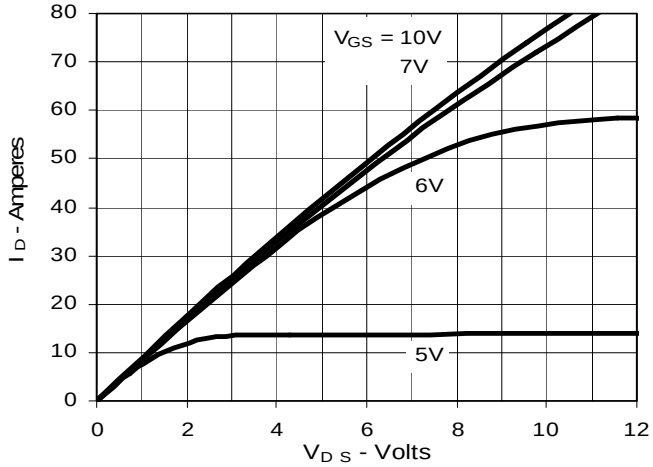


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Junction Temperature

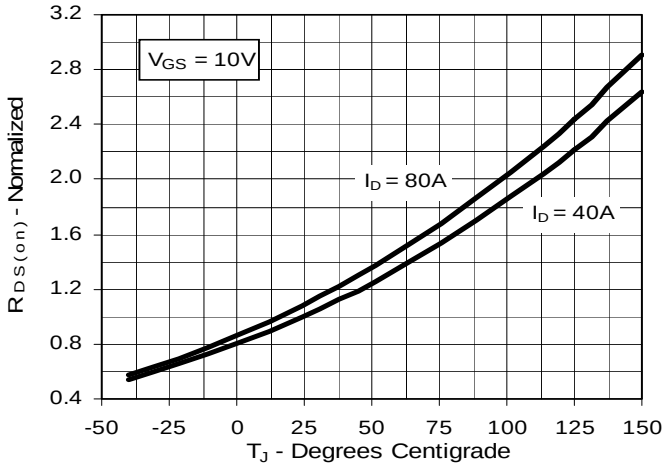


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Drain Current

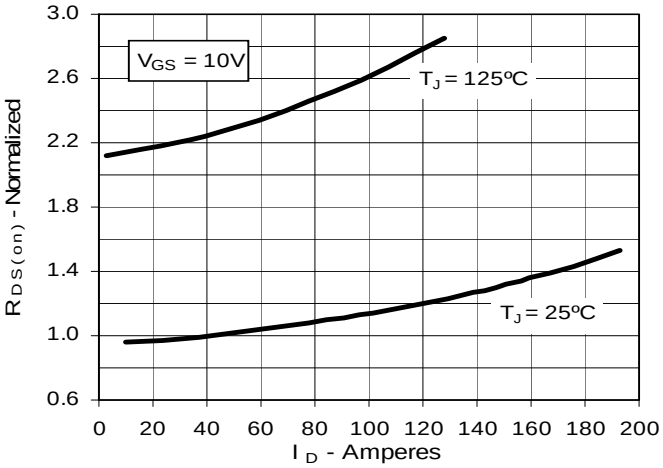


Fig. 6. Drain Current vs. Case Temperature

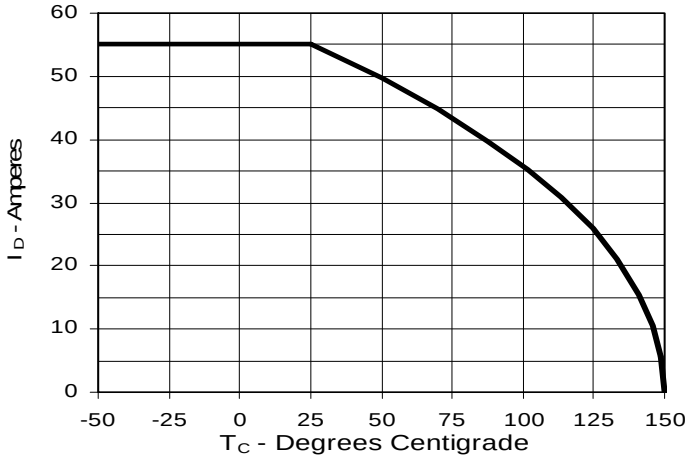


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Fig. 7. Input Admittance

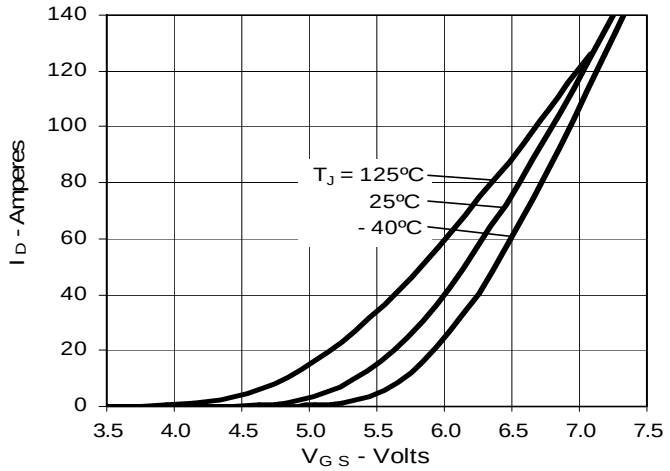


Fig. 8. Transconductance

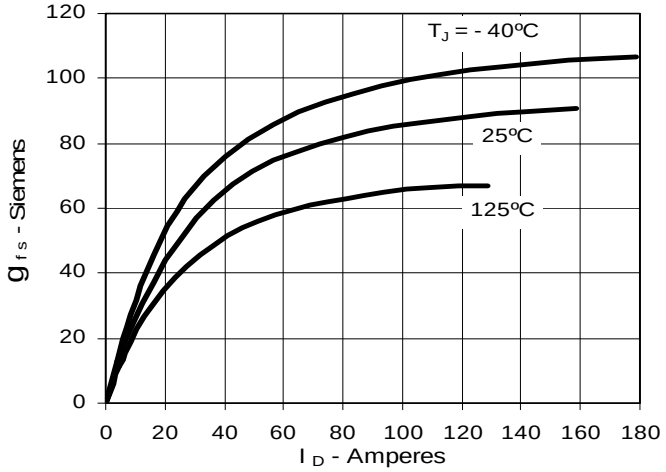


Fig. 9. Source Current vs. Source-To-Drain Voltage

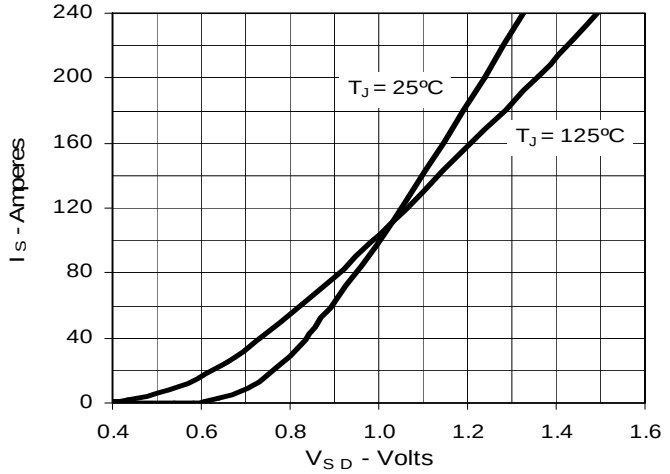


Fig. 10. Gate Charge

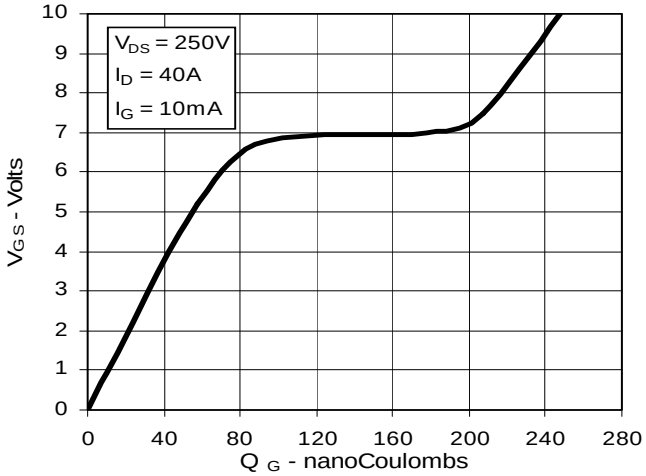


Fig. 11. Capacitance

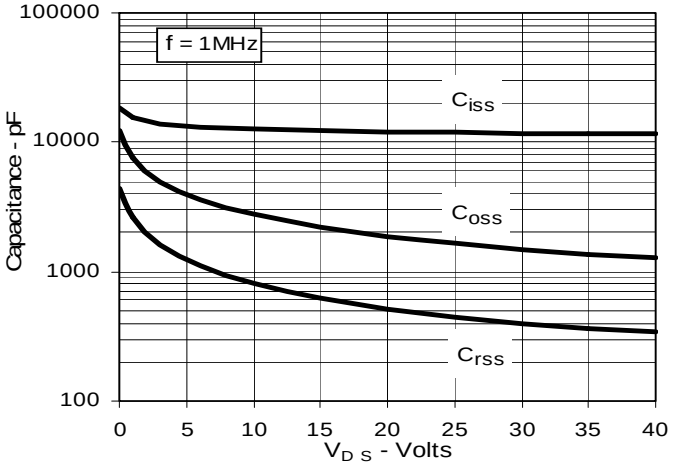
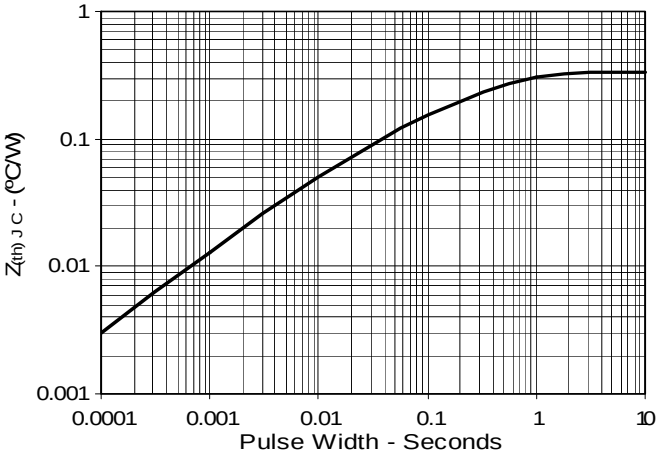


Fig. 12. Maximum Transient Thermal Impedance



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