IXYS

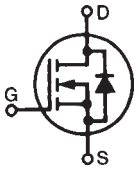
Preliminary Technical Information

X-Class HiPerFET™ Power MOSFET

IXFP14N85XM

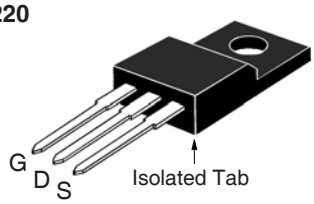
V_{DSS} = 850V
I_{D25} = 14A
$R_{DS(on)}$ ≤ 550mΩ

(Electrically Isolated Tab)



N-Channel Enhancement Mode

OVERMOLDED TO-220



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	850	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	850	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C, Limited by T_{JM}	14	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	35	A
I_A	T_C = 25°C	7	A
E_{AS}	T_C = 25°C	500	mJ
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	50	V/ns
P_D	T_C = 25°C	38	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
V_{ISOL}	50/60 Hz, 1 Minute	2500	V~
M_d	Mounting Torque	1.13 / 10	Nm/lb.in
Weight		2.5	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	850		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 1mA	3.5		5.5 V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			10 μA
	T_J = 125°C			1 mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 7A, Note 1			550 mΩ

Features

- International Standard Package
- Plastic Overmolded Tab
- Low $R_{DS(ON)}$ and Q_G
- Avalanche Rated
- 2500V~ Electrical Isolation
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- PFC Circuits
- AC and DC Motor Drives
- Robotics and Servo Controls

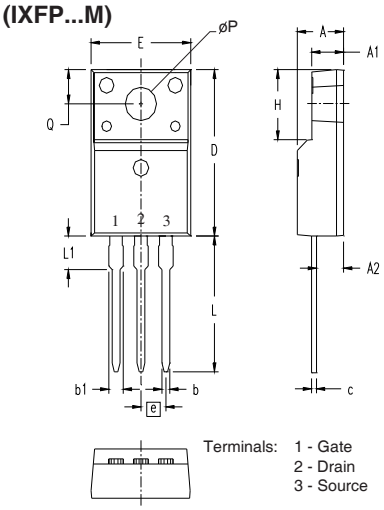
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
g_{fs}	V_{DS} = 10V, I_D = 7A, Note 1	4.6	7.7		S
R_{Gi}	Gate Input Resistance		1		Ω
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1043		pF
C_{oss}			1110		pF
C_{rss}			17		pF
	Effective Output Capacitance				
$C_{o(er)}$	Energy related; V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		55		pF
$C_{o(tr)}$	Time related; V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		177		pF
$t_{d(on)}$	**Resistive Switching Times**		16		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 7A		30		ns
$t_{d(off)}$	R_G = 10Ω (External)		36		ns
t_f			13		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 7A		30		nC
Q_{gs}			7		nC
Q_{gd}			17		nC
R_{thJC}				3.30	°C/W
R_{thCS}			0.50		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
I_S	V_{GS} = 0V			14	A
I_{SM}	Repetitive, pulse Width Limited by T_{JM}			56	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.4	V
t_{rr}	I_F = 7A, -di/dt = 100A/μs		116		ns
Q_{RM}	V_R = 100V		0.9		μC
I_{RM}			15.5		A

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

OVERMOLDED TO-220 (IXFP...M)



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.177	.193	4.50	4.90
A1	.092	.108	2.34	2.74
A2	.101	.117	2.56	2.96
b	.028	.035	0.70	0.90
b1	.050	.058	1.27	1.47
c	.018	.024	0.45	0.60
D	.617	.633	15.67	16.07
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.499	.523	12.68	13.28
L1	.119	.135	3.03	3.43
ØP	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ T_J = 25°C

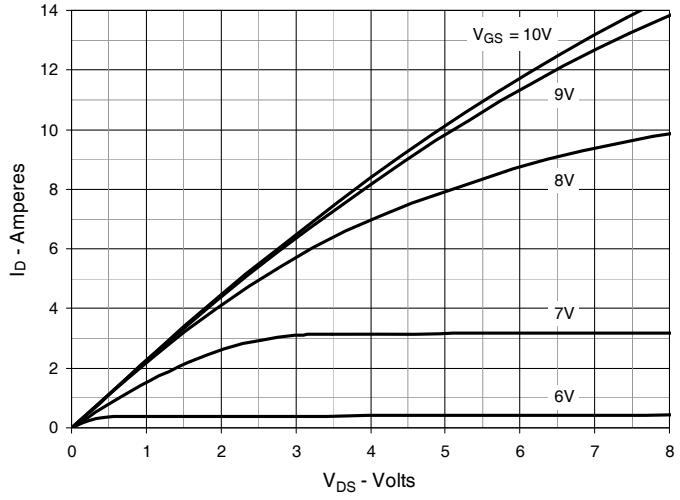


Fig. 2. Extended Output Characteristics @ T_J = 25°C

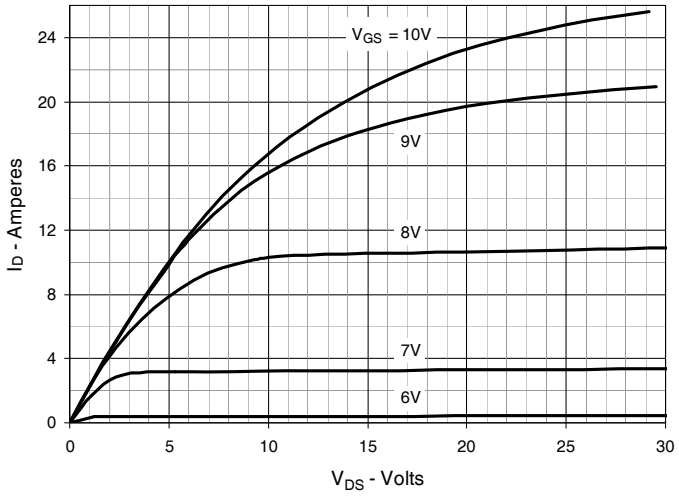


Fig. 3. Output Characteristics @ T_J = 125°C

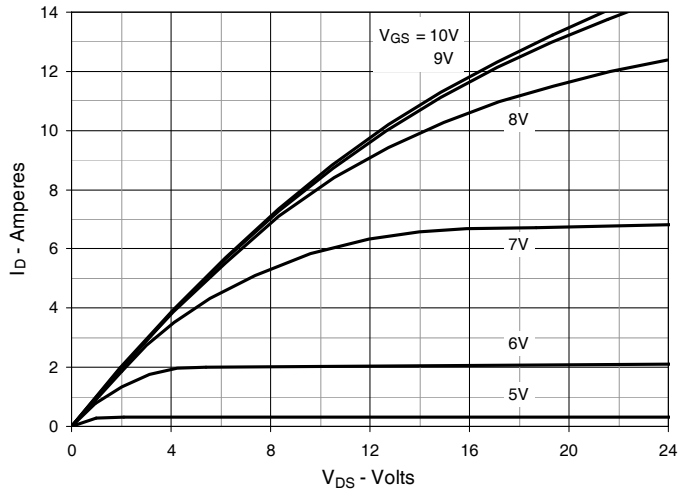


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 7A Value vs. Junction Temperature

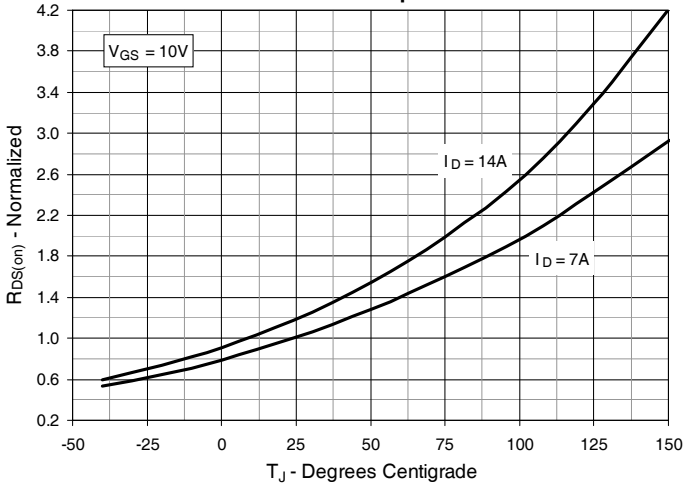


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 7A Value vs. Drain Current

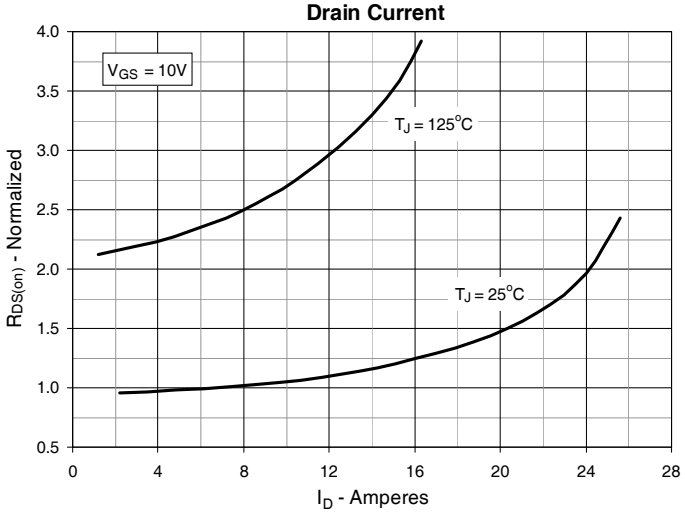


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature

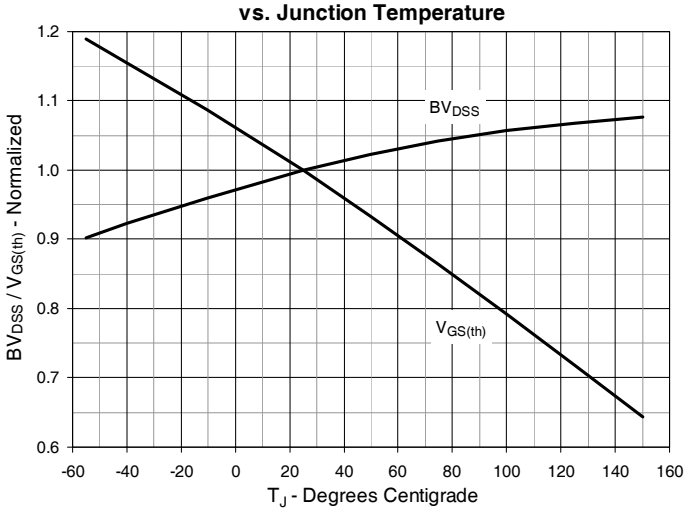


Fig. 7. Input Admittance

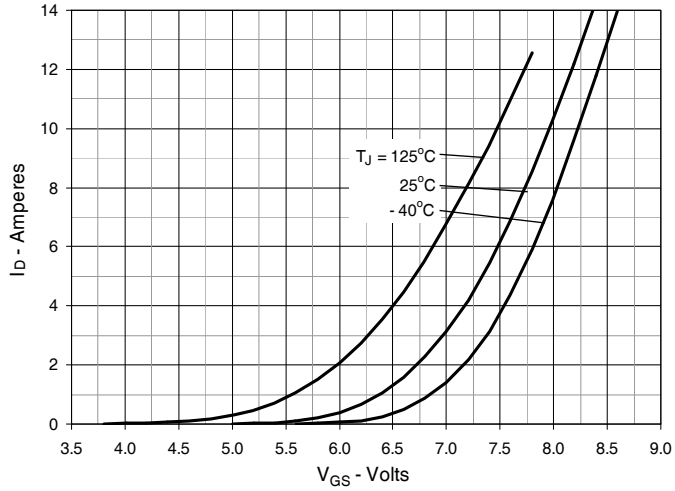


Fig. 8. Transconductance

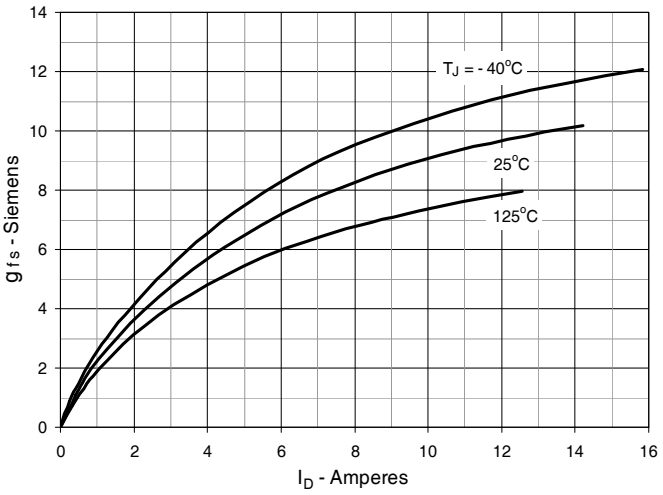


Fig. 9. Forward Voltage Drop of Intrinsic Diode

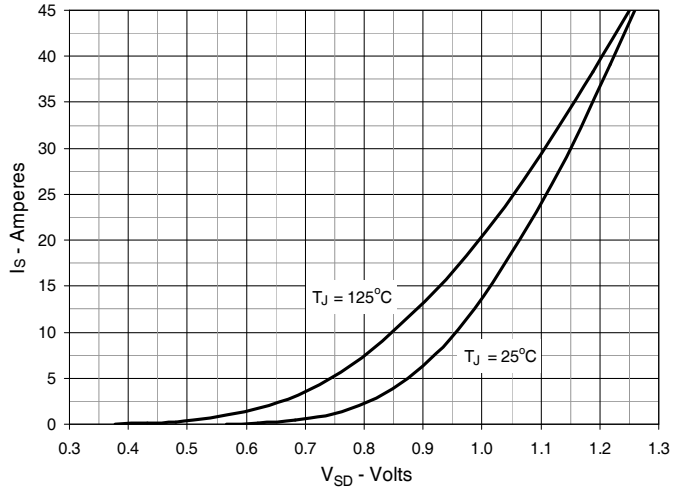


Fig. 10. Gate Charge

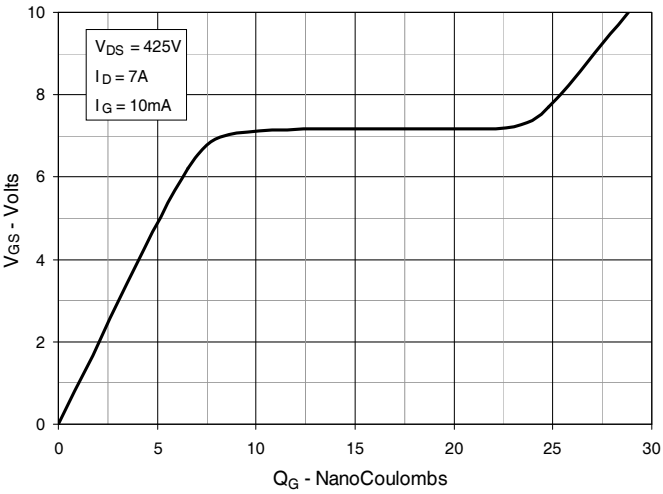


Fig. 11. Capacitance

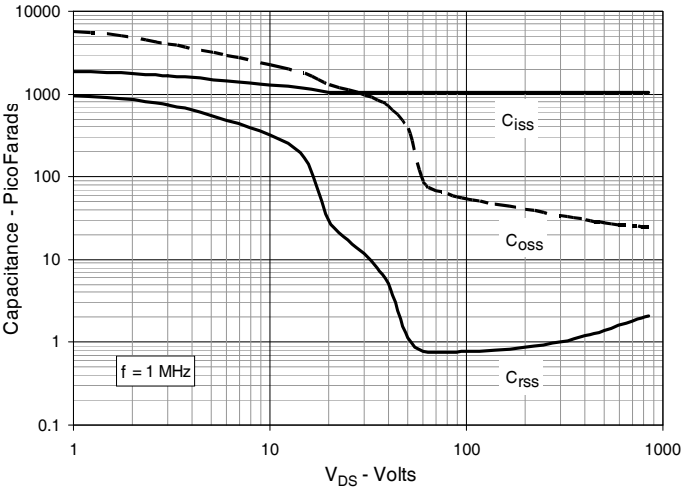


Fig. 12. Forward-Bias Safe Operating Area

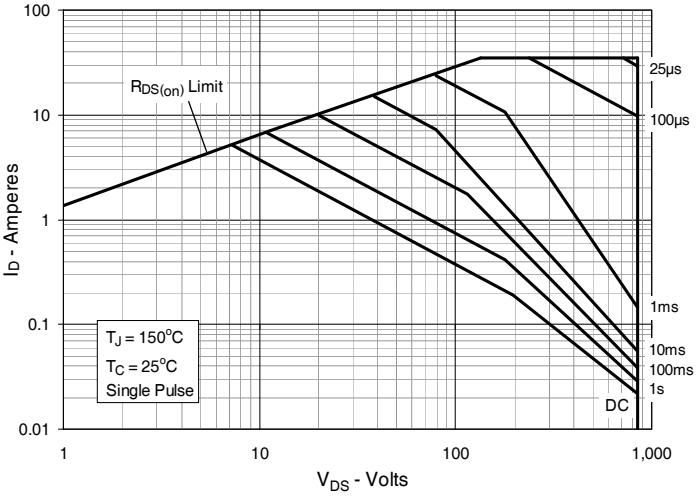


Fig. 13. Output Capacitance Stored Energy

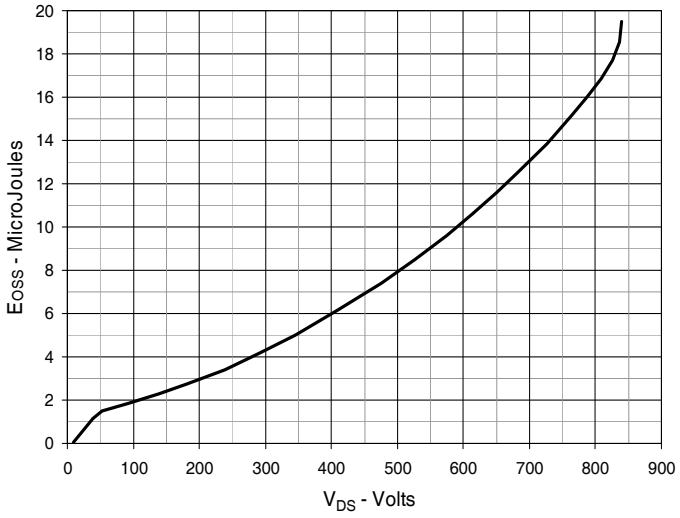
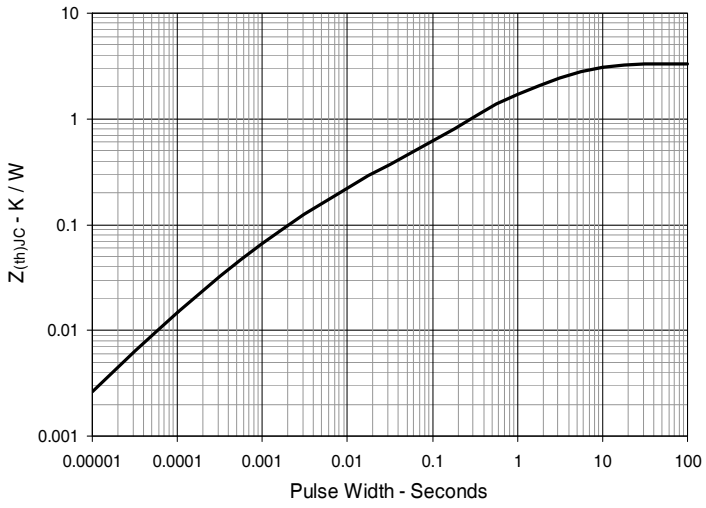


Fig. 14. Maximum Transient Thermal Impedance



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