

X-Class HiPERFET Power MOSFET

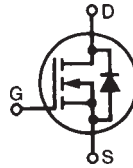
IXFP8N85XM

$$V_{DSS} = 850V$$

$$I_{D25} = 8A$$

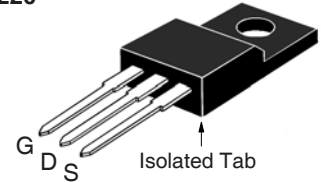
$$R_{DS(on)} \leq 850m\Omega$$

(Electrically Isolated Tab)



N-Channel Enhancement Mode

OVERMOLDED
TO-220



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	850	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	850	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$, Limited by T_{JM}	8	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	16	A
I_A	$T_C = 25^\circ C$	4	A
E_{AS}	$T_C = 25^\circ C$	300	mJ
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$	50	V/ns
P_D	$T_C = 25^\circ C$	33	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ C$
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
M_d	Mounting Torque	1.13 / 10	Nm/lb.in
Weight		2.5	g

Features

- International Standard Package
- Plastic Overmolded Tab
- High Voltage Package
- Low $R_{DS(ON)}$ and Q_G
- Avalanche Rated
- 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 ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	850		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	3.0		5.5 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$			10 μA 750 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 4A$, Note 1			850 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
g_{fs}	$V_{DS} = 10\text{V}$, $I_D = 4\text{A}$, Note 1	2.7	4.5	S
R_{Gi}	Gate Input Resistance		3	Ω
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		654	pF
C_{oss}			714	pF
C_{rss}			11	pF
Effective Output Capacitance				
$C_{o(er)}$	Energy related	$V_{GS} = 0\text{V}$ $V_{DS} = 0.8 \cdot V_{DSS}$	40	pF
$C_{o(tr)}$	Time related		120	pF
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 4\text{A}$		17.0	nC
Q_{gs}			3.6	nC
Q_{gd}			10.0	nC
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 4\text{A}$ $R_G = 10\Omega$ (External)		15	ns
t_r			25	ns
$t_{d(off)}$			32	ns
t_f			23	ns
R_{thJC}				3.78 $^\circ\text{C/W}$
R_{thCS}		0.50		$^\circ\text{C/W}$

Source-Drain Diode

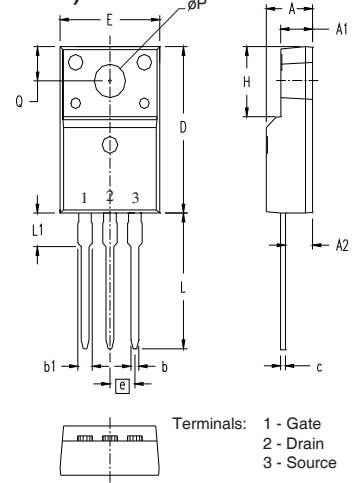
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
I_S	$V_{GS} = 0\text{V}$			8 A
I_{SM}	Repetitive, pulse Width Limited by T_{JM}			32 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1			1.4 V
t_{rr}	$I_F = 4\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$		125	ns
Q_{RM}			1.1	μC
I_{RM}			18.0	A

Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

ADVANCE 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.

OVERMOLDED TO-220 (IXFP...M)



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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
$\emptyset P$.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

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	6,404,065B1	6,683,344	6,727,585	7,005,734B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123B1	6,534,343	6,710,405B2	6,759,692	7,063,975B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728B1	6,583,505	6,710,463	6,771,478B2	7,071,537	

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

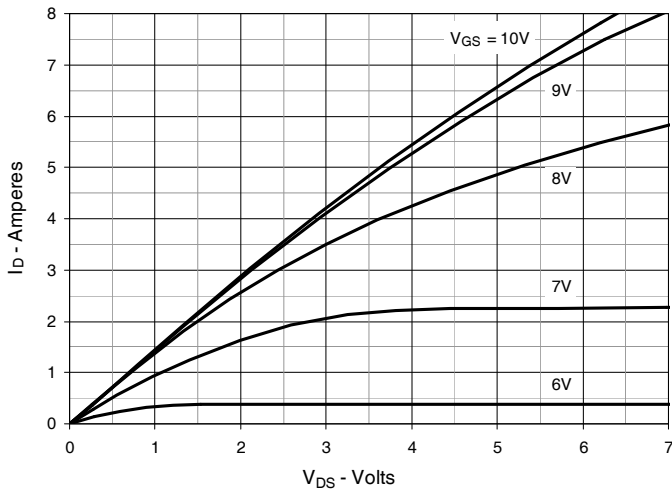


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

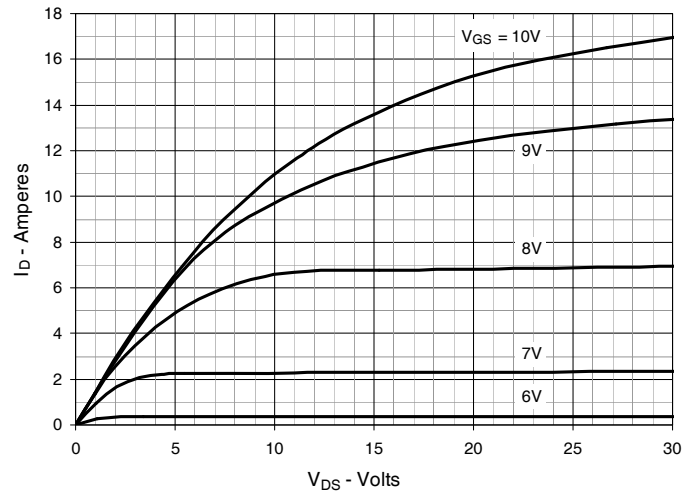


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

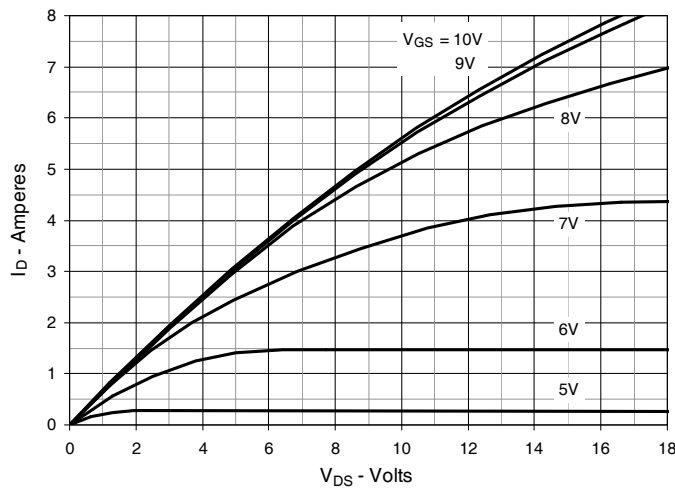


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 4\text{A}$ Value vs. Junction Temperature

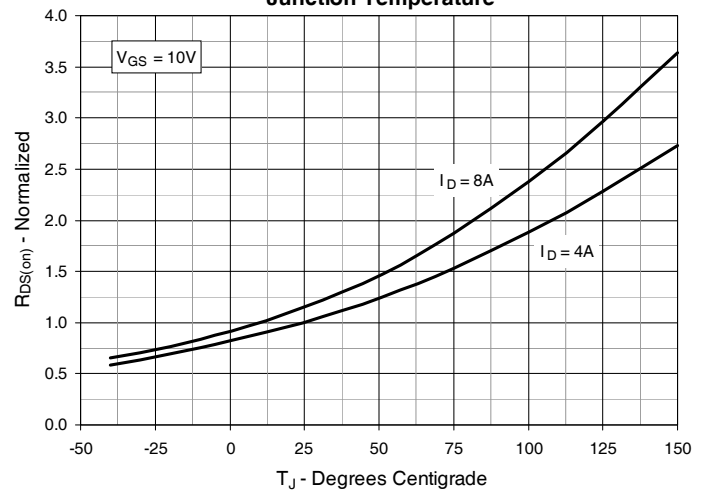


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 4\text{A}$ Value vs. Drain Current

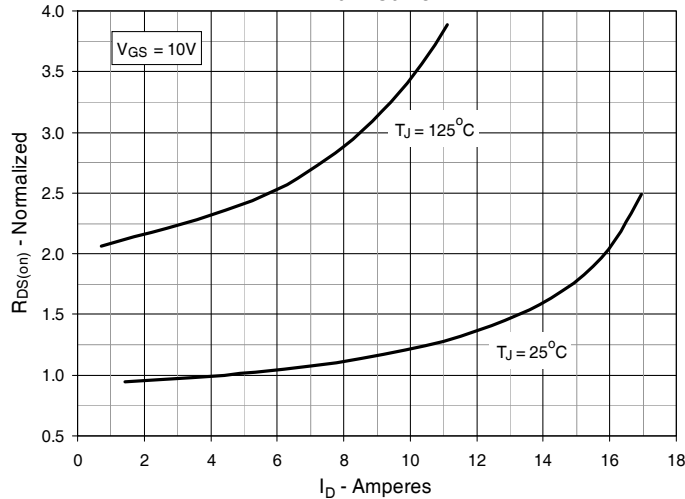


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature

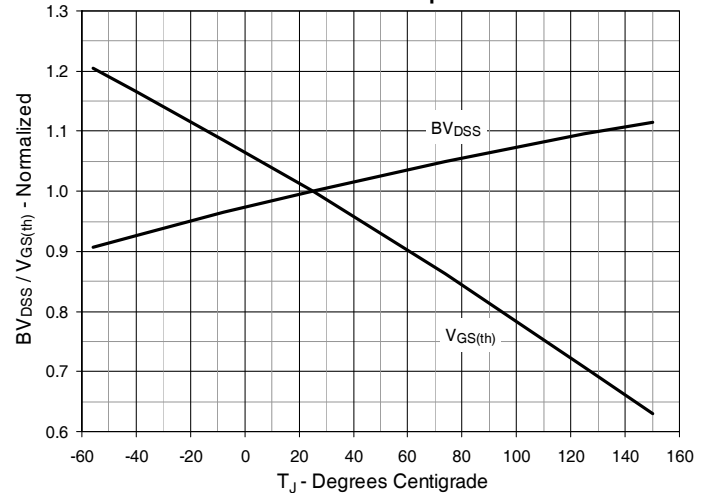


Fig. 7. Input Admittance

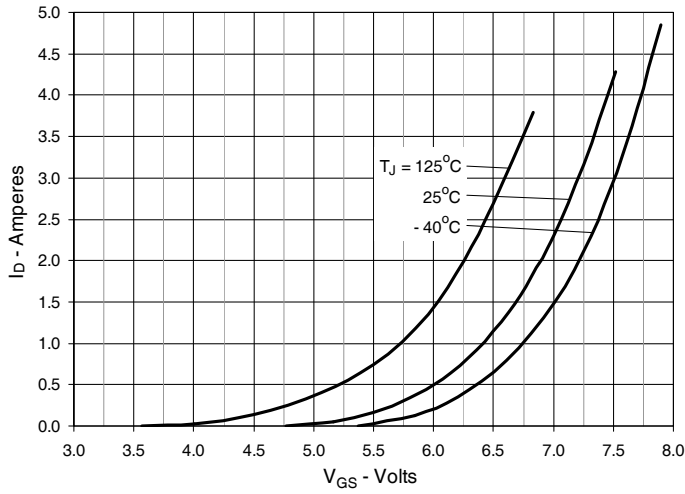


Fig. 8. Transconductance

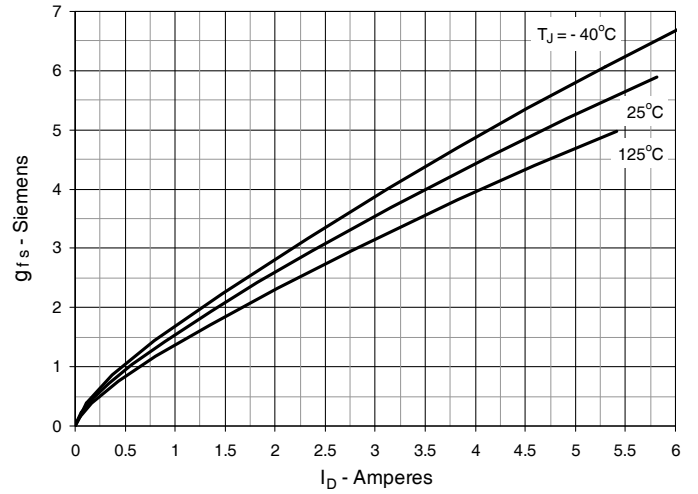


Fig. 9. Forward Voltage Drop of Intrinsic Diode

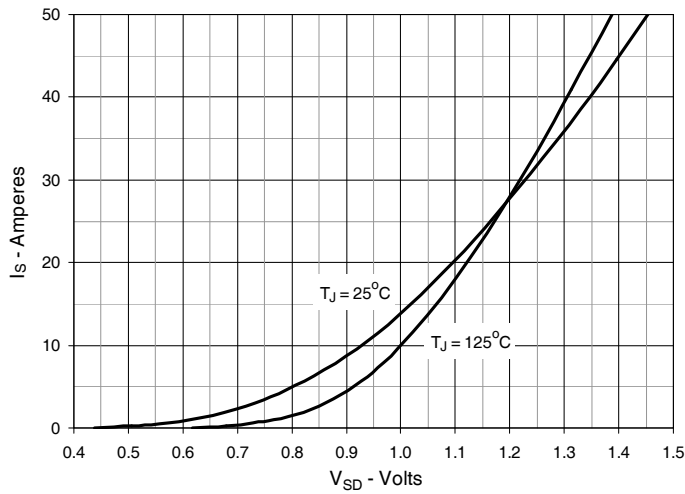


Fig. 10. Gate Charge

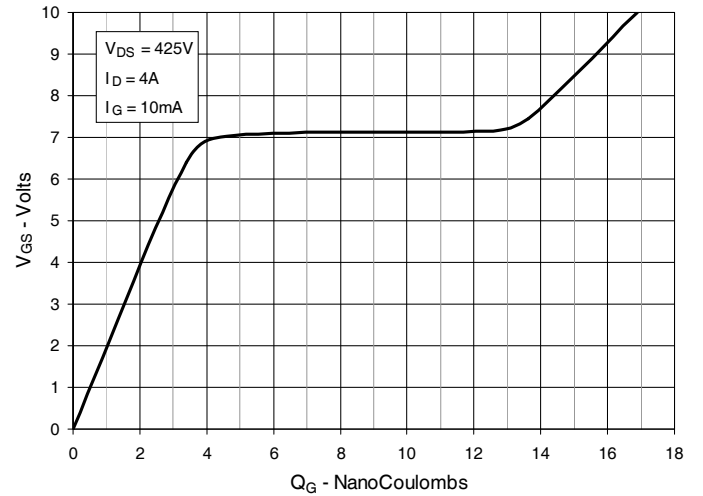


Fig. 11. Capacitance

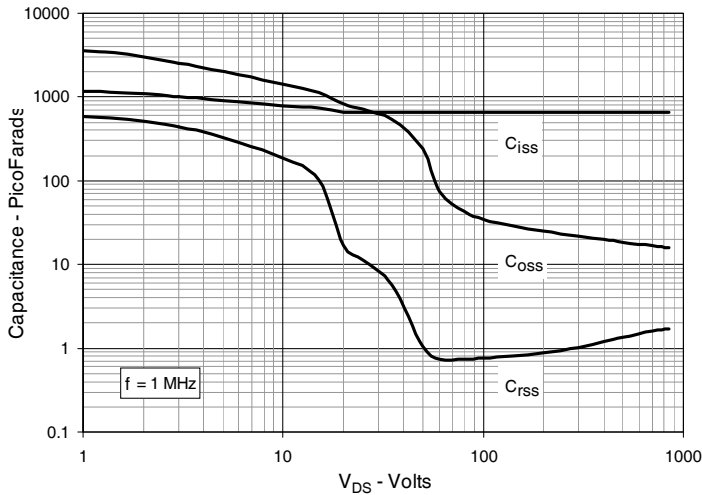


Fig. 12. Output Capacitance Stored Energy

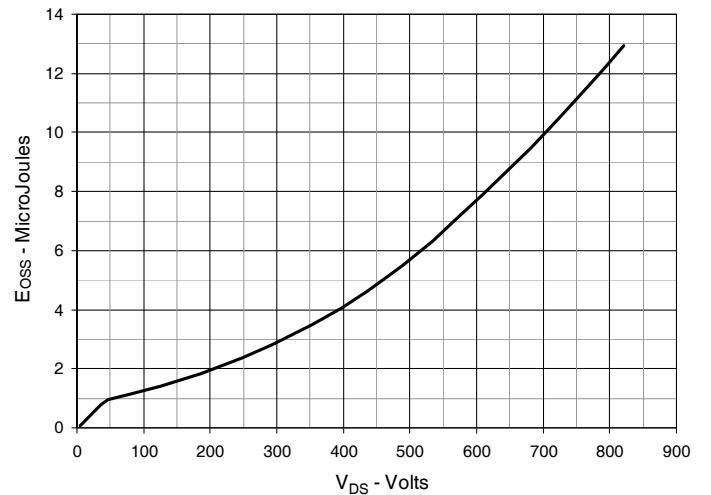


Fig. 13. Forward-Bias Safe Operating Area

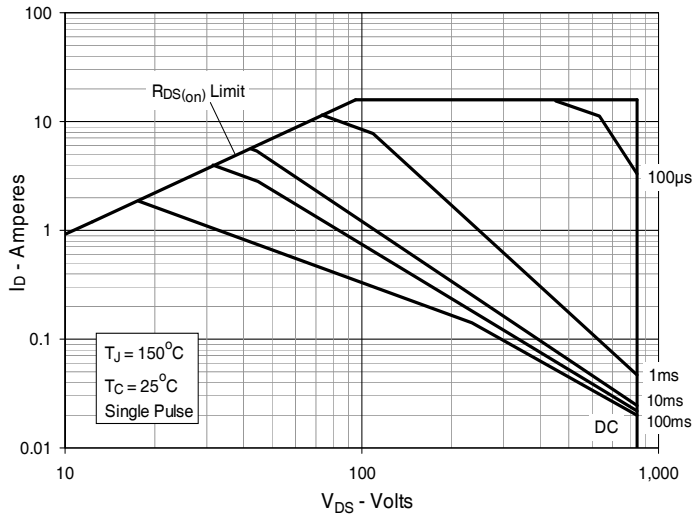


Fig. 14. Maximum Transient Thermal Impedance

