IXYS

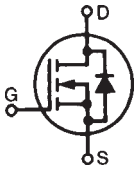
Preliminary Technical Information

X2-Class Power MOSFET

IXTP8N70X2M

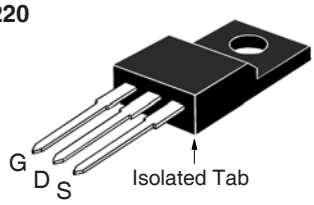
V_{DSS} = 700V
I_{D25} = 8A
$R_{DS(on)}$ ≤ 550mΩ

(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	700	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	700	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C, Limited by T_{JM}	8	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	16	A
I_A	T_C = 25°C	4	A
E_{AS}	T_C = 25°C	250	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	32	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 = 250μA	700			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	3.0		5.0	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			250	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 4A, Note 1			550	mΩ

Features

- International Standard Package
- Plastic Overmolded Tab
- High Voltage Package
- 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

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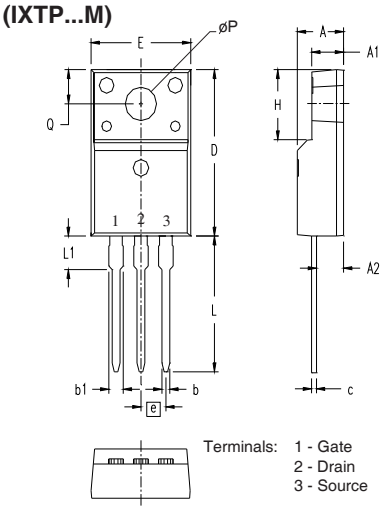
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
g_{fs}	V_{DS} = 10V, I_D = 4A, Note 1	4.8	8.0		S
R_{Gi}	Gate Input Resistance		6		Ω
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		800		pF
C_{oss}			495		pF
C_{rss}			2.2		pF
	Effective Output Capacitance				
$C_{o(er)}$	Energy related; V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		43		pF
$C_{o(tr)}$	Time related; V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		129		pF
$t_{d(on)}$	**Resistive Switching Times**		24		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 4A		28		ns
$t_{d(off)}$	R_G = 30Ω (External)		53		ns
t_f			24		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 4A		12.0		nC
Q_{gs}			3.1		nC
Q_{gd}			4.4		nC
R_{thJC}				3.90	°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			8	A
I_{SM}	Repetitive, pulse Width Limited by T_{JM}			32	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.4	V
t_{rr}	I_F = 4A, -di/dt = 100A/μs		200		ns
Q_{RM}	V_R = 100V		1.65		μC
I_{RM}			16.3		A

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

OVERMOLDED TO-220 (IXTP...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.

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 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123B1 6,306,728B1 6,404,065B1 6,534,343 6,583,505 6,683,344 6,710,405B2 6,710,463 6,727,585 6,759,692 6,771,478B2 7,005,734B2 7,063,975B2 7,071,537 7,157,338B2

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

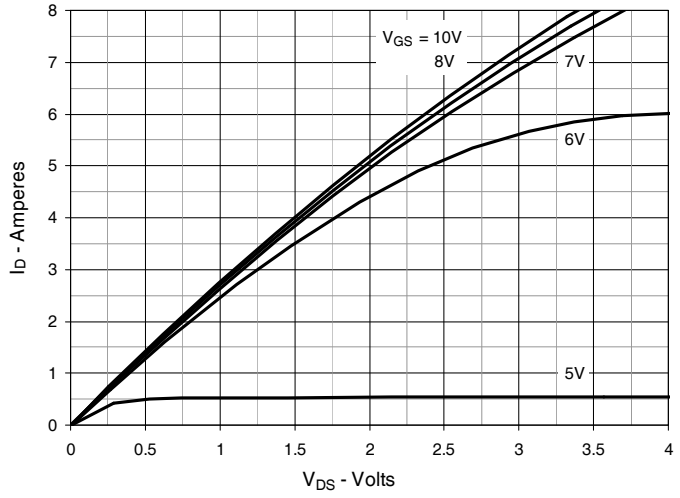


Fig. 2. Extended Output Characteristics @ T_J = 25°C

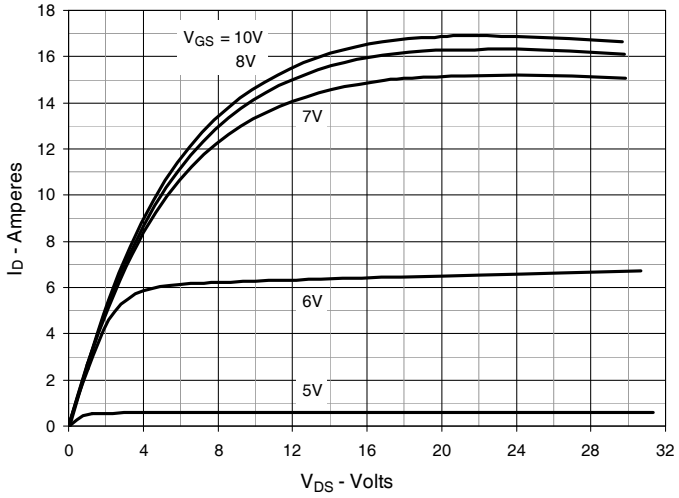


Fig. 3. Output Characteristics @ T_J = 125°C

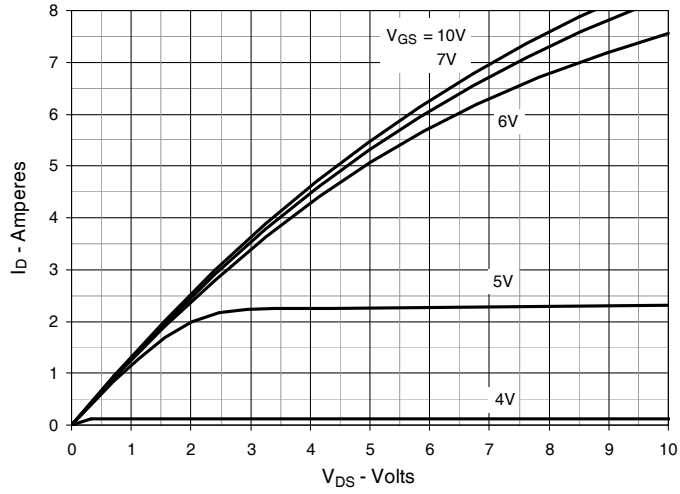


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 4A Value vs. Junction Temperature

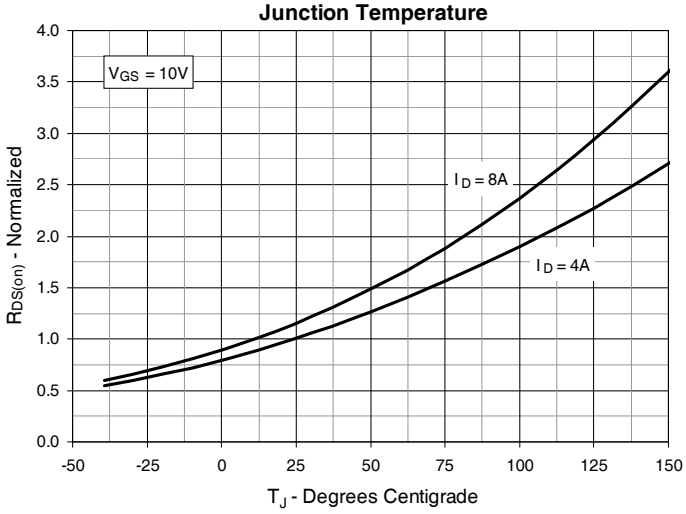


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 4A Value vs. Drain Current

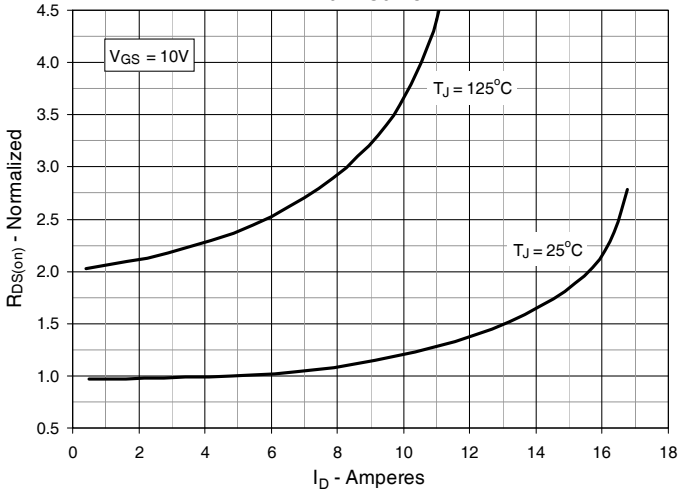
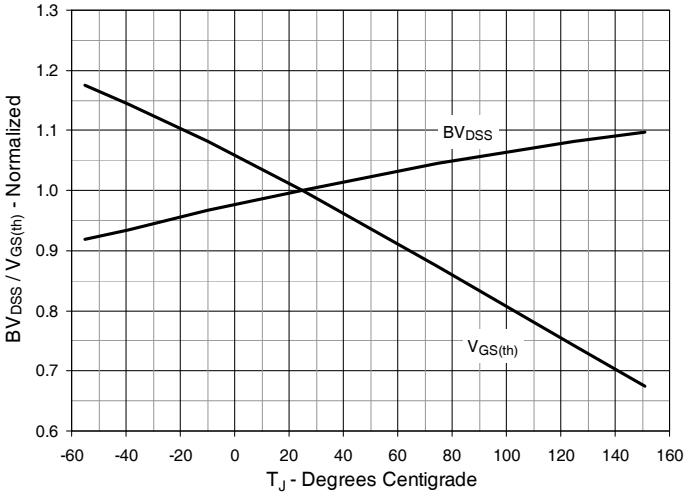


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature



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Fig. 7. Input Admittance

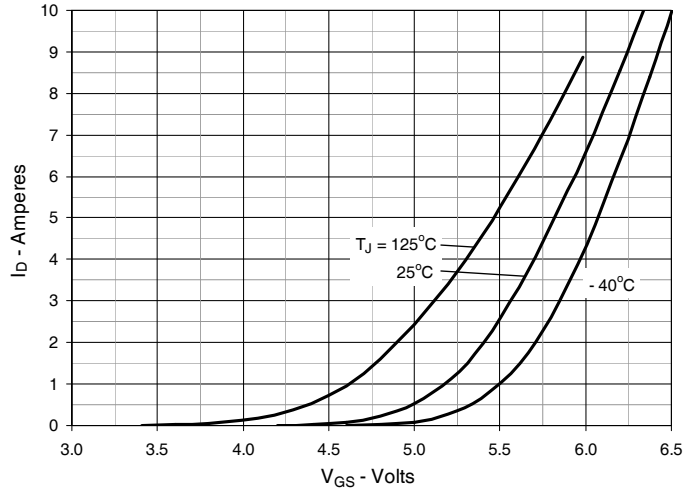


Fig. 8. Transconductance

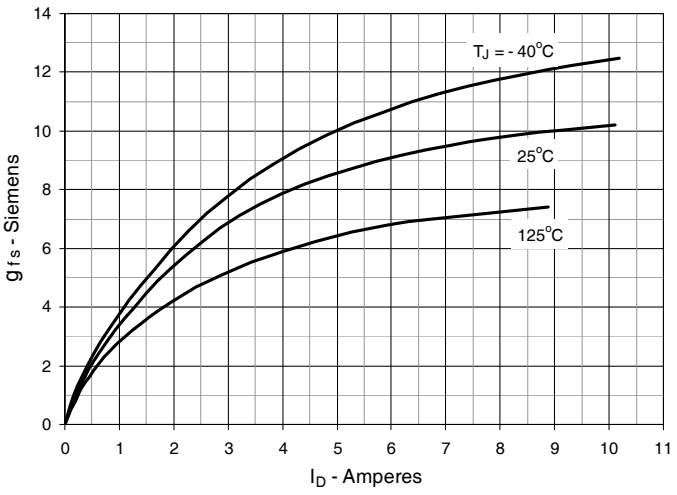


Fig. 9. Forward Voltage Drop of Intrinsic Diode

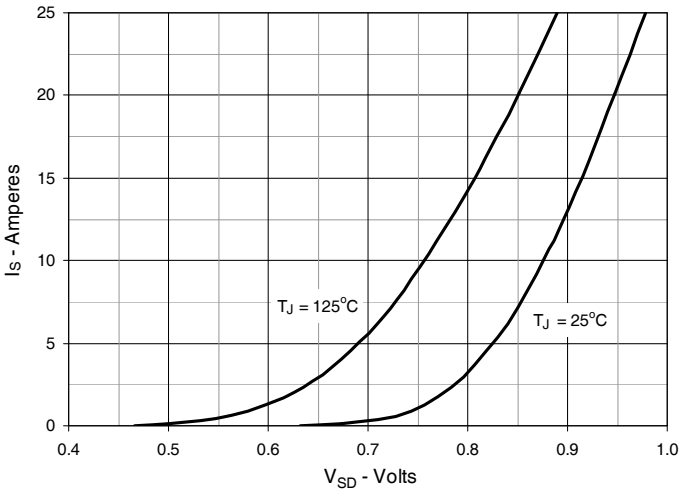


Fig. 10. Gate Charge

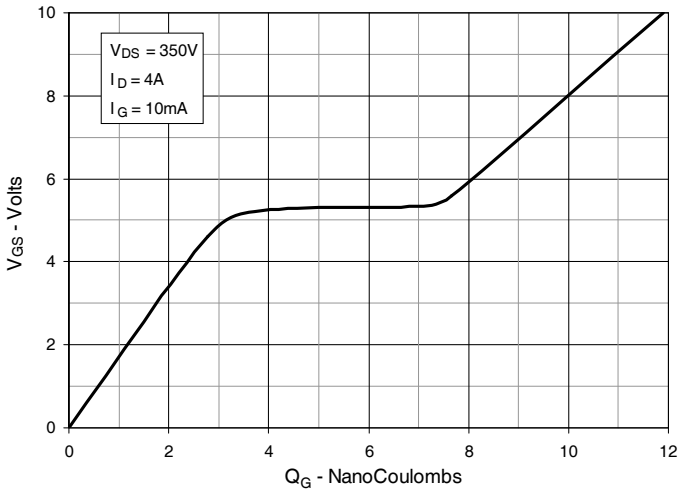


Fig. 11. Capacitance

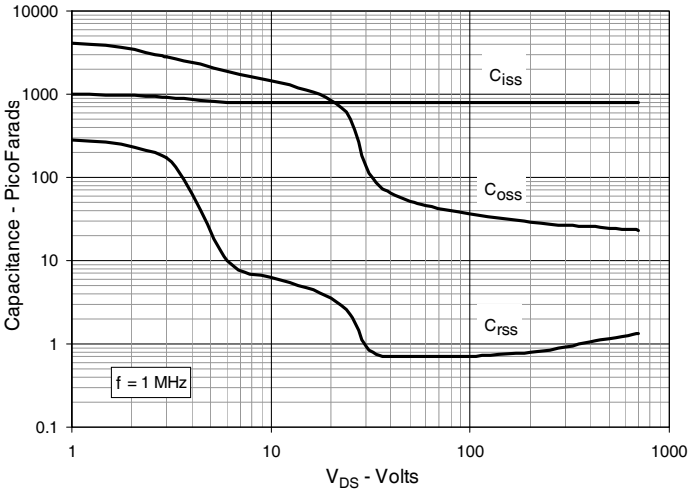
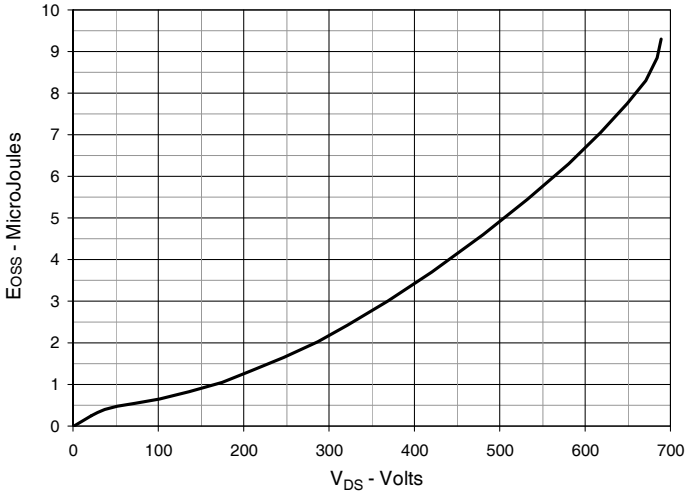


Fig. 12. Output Capacitance Stored Energy



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Fig. 13. Forward-Bias Safe Operating Area

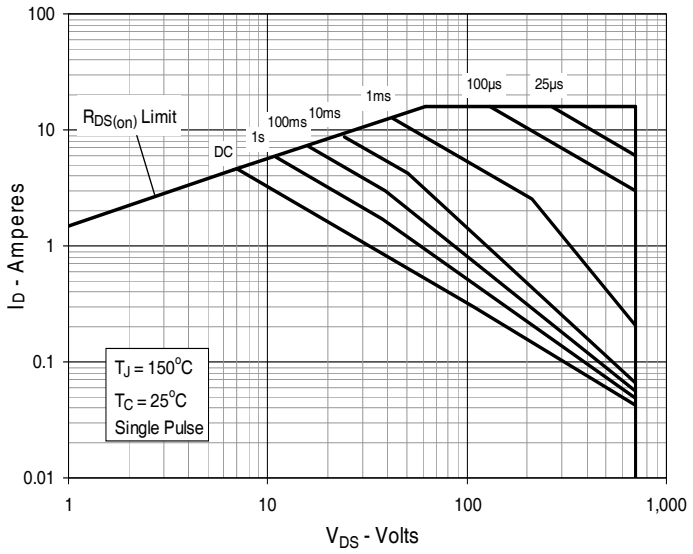
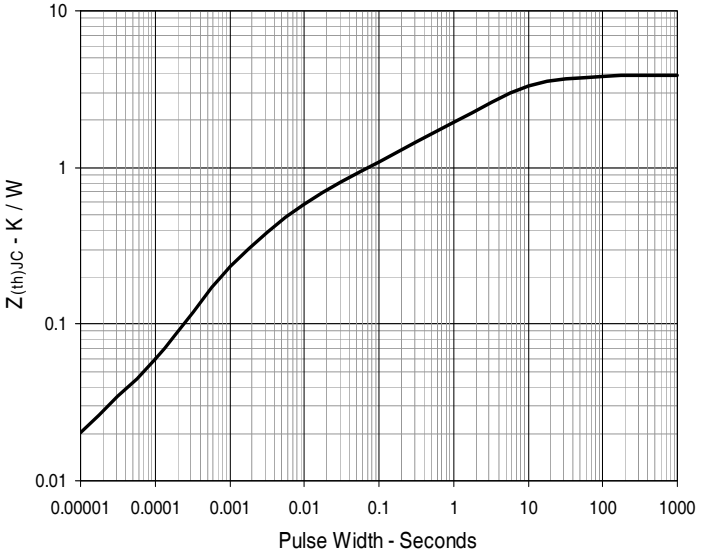


Fig. 14. Maximum Transient Thermal Impedance



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