IXYS

Advance Technical Information

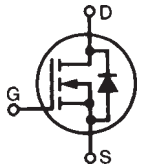
Polar™ HiPerFET™ Power MOSFET

IXFP5N100PM

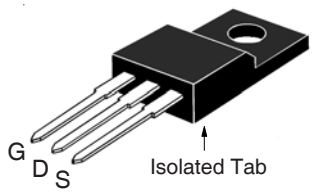
V_{DSS} = 1000V
I_{D25} = 2.3A
$R_{DS(on)}$ ≤ 2.8Ω

(Electrically Isolated Tab)

N-Channel Enhancement Mode
Avalanche Rated



OVERMOLDED (IXFP...M) OUTLINE



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	1000	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	1000	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	2.3	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	10	A
I_A	T_C = 25°C	5	A
E_{AS}	T_C = 25°C	300	mJ
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	10	V/ns
P_D	T_C = 25°C	42	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}	Plastic Body for 10s	260	°C
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	1000			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	3.0		6.0	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			750	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 2.5A, Note 1			2.8	Ω

Features

- Plastic overmolded Tab for Electrical Isolation
- Low $R_{DS(on)}$ and Q_G
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

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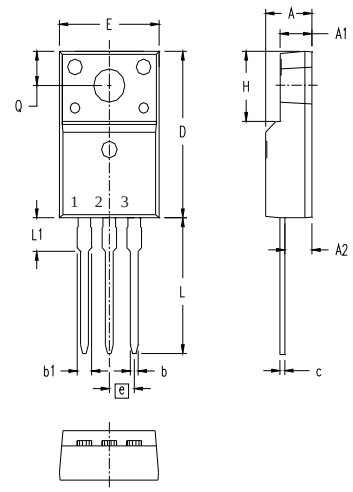
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 2.5A, Note 1	2.4	4.0		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1830		pF
C_{oss}			113		pF
C_{rss}			20		pF
R_{Gi}	Gate Input Resistance		1.6		Ω
$t_{d(on)}$	**Resistive Switching Times**		12		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 2.5A		13		ns
$t_{d(off)}$	R_G = 5Ω (External)		30		ns
t_f			37		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 2.5A		33.4		nC
Q_{gs}			10.6		nC
Q_{gd}			14.4		nC
R_{thJC}				3.0	°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			5	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			20	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 5A, -di/dt = 100A/μs			200	ns
I_{RM}	V_R = 100V, V_{GS} = 0V		7.4		A
Q_{RM}			0.43		μC

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

OVERMOLDED TO-220 FULL PAK



Terminals: 1 - Gate
2 - Drain
3 - Source

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

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.

IXYS Reserves the Right to Change Limits,Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or moreof 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 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

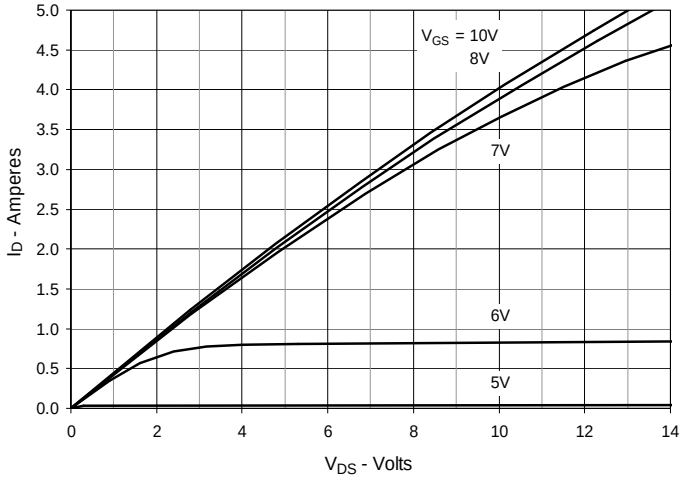


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

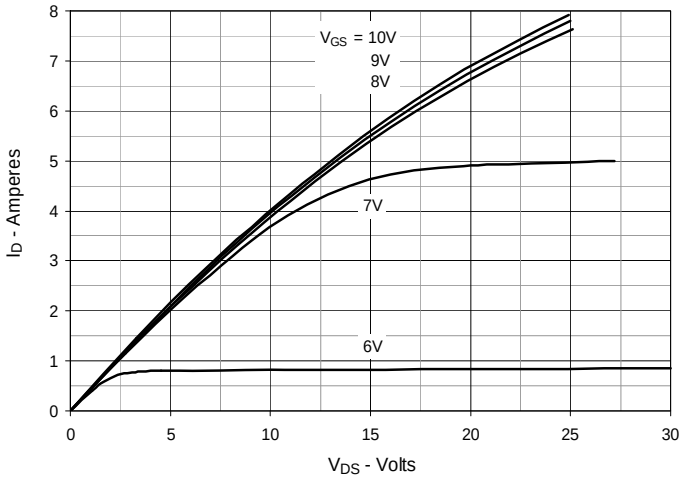


Fig. 3. Output Characteristics @ T_J = 125ºC

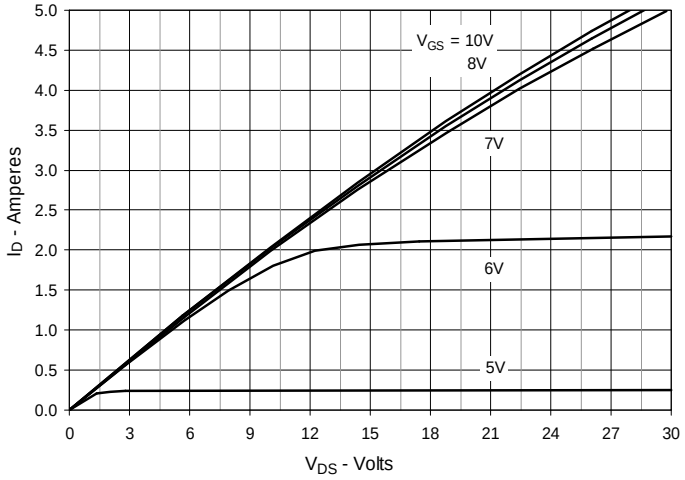


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 2.5A Value vs. Junction Temperature

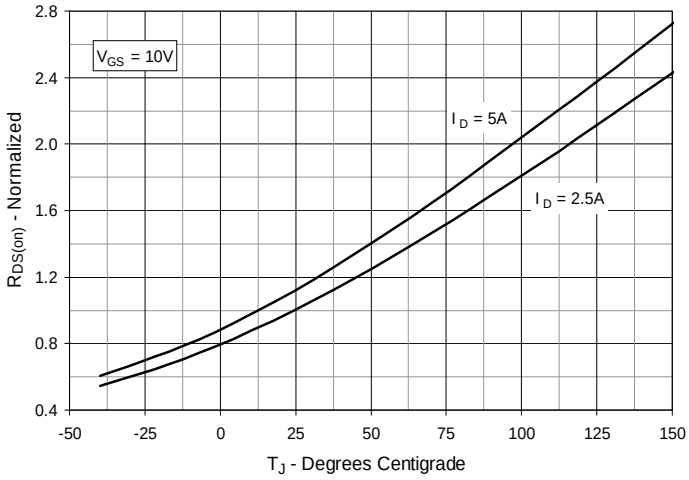


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 2.5A Value vs. Drain Current

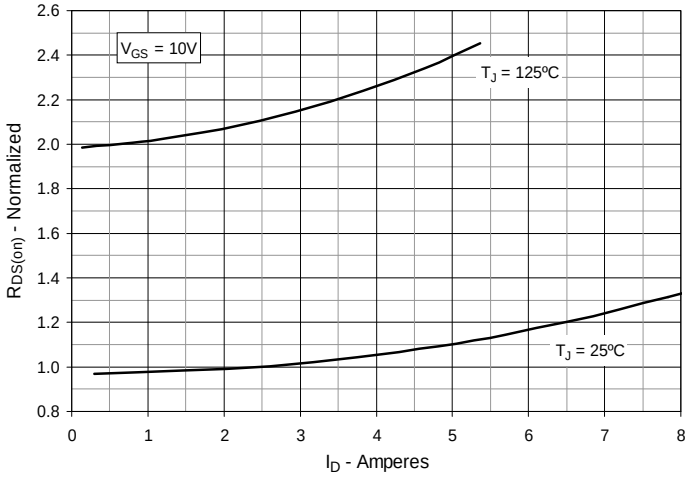
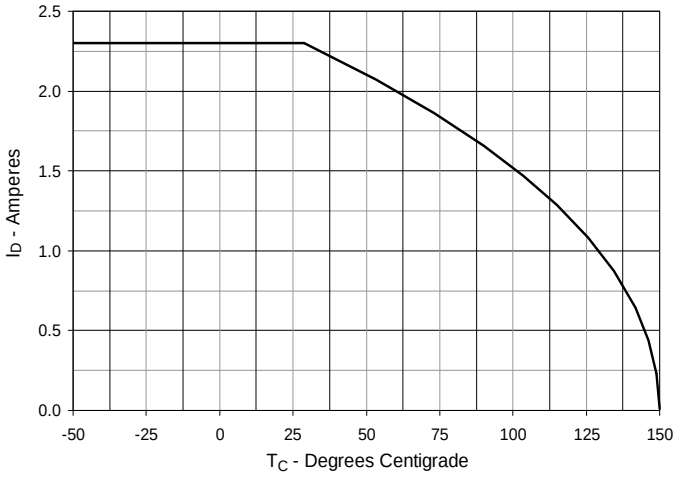


Fig. 6. Maximum Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

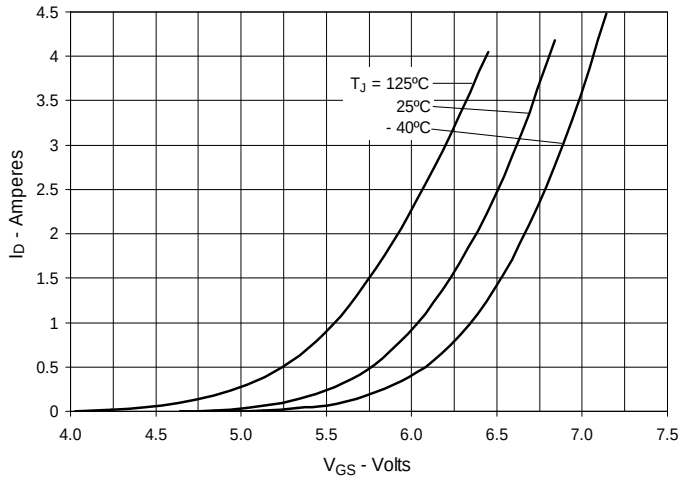


Fig. 8. Transconductance

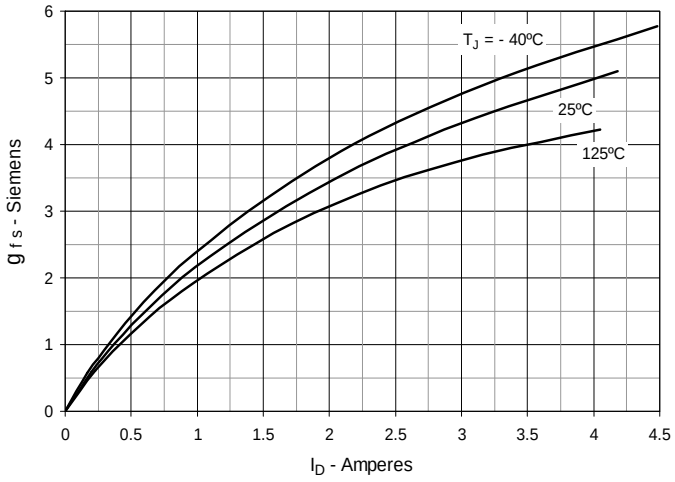


Fig. 9. Forward Voltage Drop of Intrinsic Diode

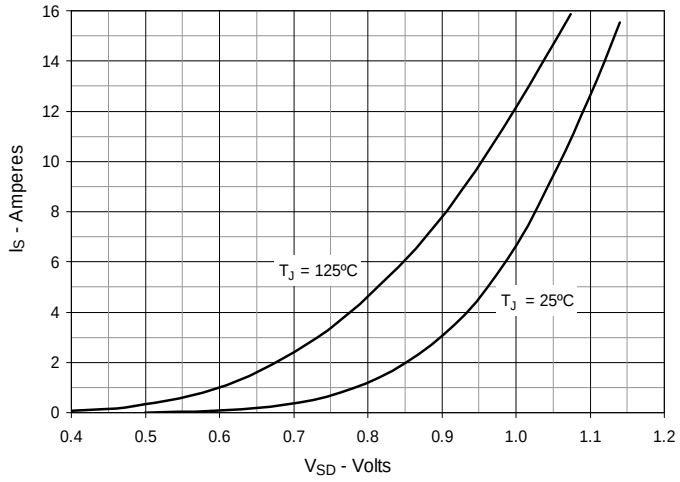


Fig. 10. Gate Charge

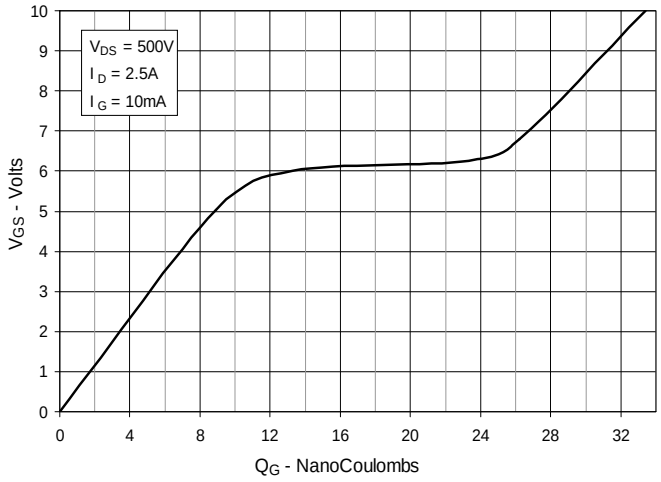


Fig. 11. Capacitance

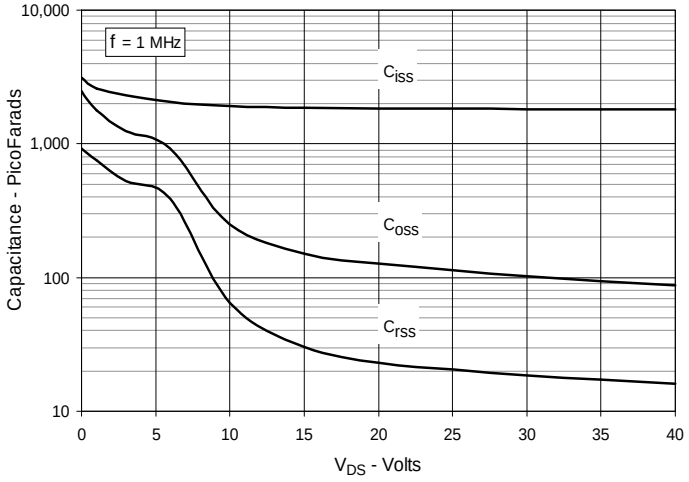
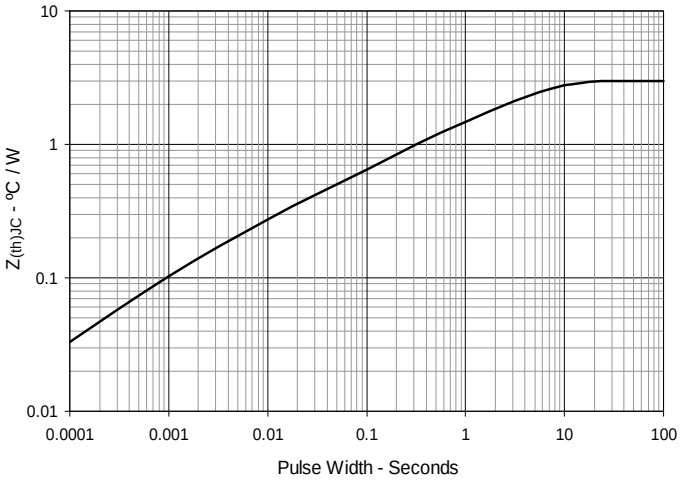


Fig. 12. Maximum Transient Thermal Impedance



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