IXYS

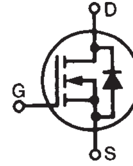
PolarHV™ HiPerFET Power MOSFET

IXFP7N80PM

(Electrically Isolated Tab)

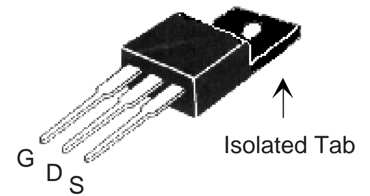
V_{DSS}	=	800 V
I_{D25}	=	3.5 A
$R_{DS(on)}$	≤	1.44 Ω
t_{rr}	≤	250 ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	800	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25°C	3.5	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	18	A
I_{AR}	T_C = 25°C	4	A
E_{AR}	T_C = 25°C	20	mJ
E_{AS}	T_C = 25°C	300	mJ
dv/dt	I_S ≤ I_{DM}, di/dt ≤ 100 A/µs, V_{DD} ≤ V_{DSS}, T_J ≤ 150°C, R_G = 10 Ω	10	V/ns
P_D	T_C = 25°C	50	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°C
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		3.0	g

OVERMOLDED TO-220 (IXTP...M) OUTLINE



G = Gate D = Drain
S = Source

Features

- Plastic overmolded tab for electrical isolation
- Fast intrinsic diode
- International standard package
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	800			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA	3.0		5.0	V
I_{GSS}	V_{GS} = ±30 V, V_{DS} = 0 V			±100	nA
I_{DSS}	V_{DS} = V_{DSS}			25	µA
	V_{GS} = 0 V T_J = 125°C			500	µA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 3.5 A Note 1			1.44	Ω

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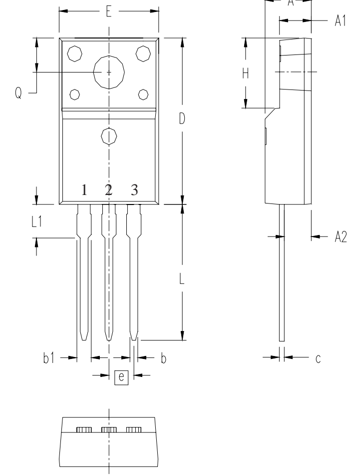
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; I_D = 3.5 A, Note 1	5	9.5		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1890		pF
C_{oss}			133		pF
C_{rss}			13		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 4 A		28		ns
t_r	R_G = 10 Ω (External)		32		ns
$t_{d(off)}$			55		ns
t_f			24		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 6 A		32		nC
Q_{gs}			12		nC
Q_{gd}			9		nC
R_{thJC}				2.5	°C/W

ISOLATED TO-220 (IXFP...M)



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)

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

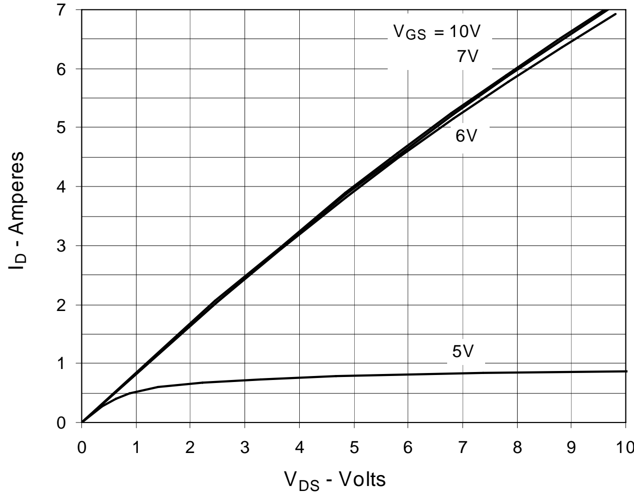
Source-Drain Diode

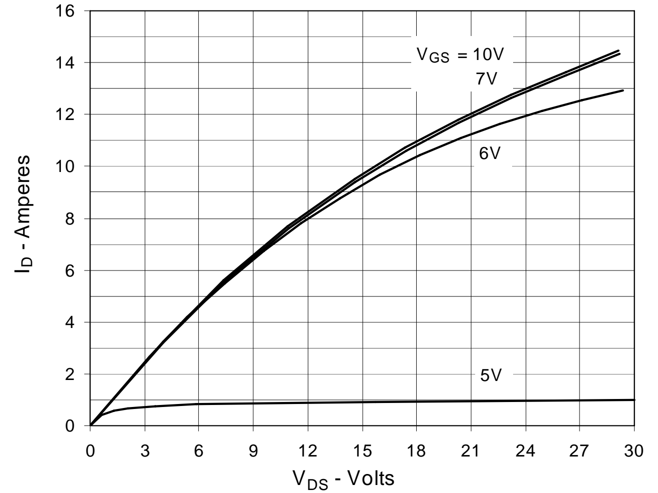
Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			7	A
I_{SM}	Repetitive			18	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 7 A, -di/dt = 100 A/µs,			250	ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		0.3		µC
I_{RM}			3		A

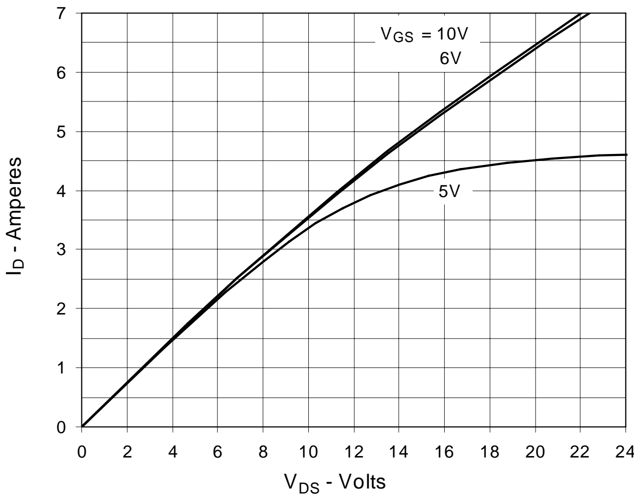
Notes: 1) Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %

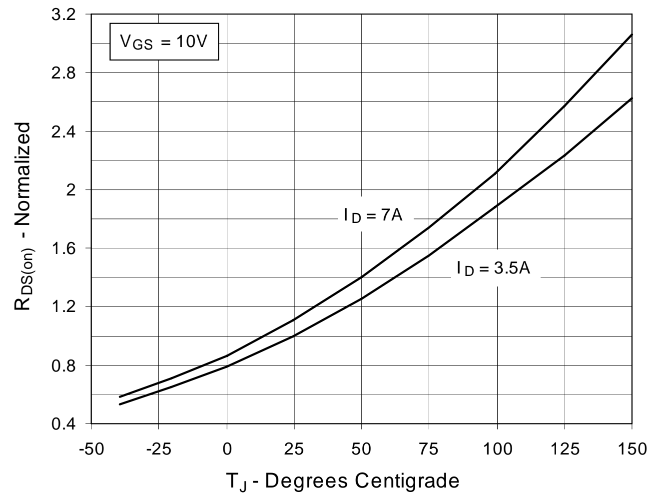
IXYS reserves the right to change limits, test conditions, and dimensions.

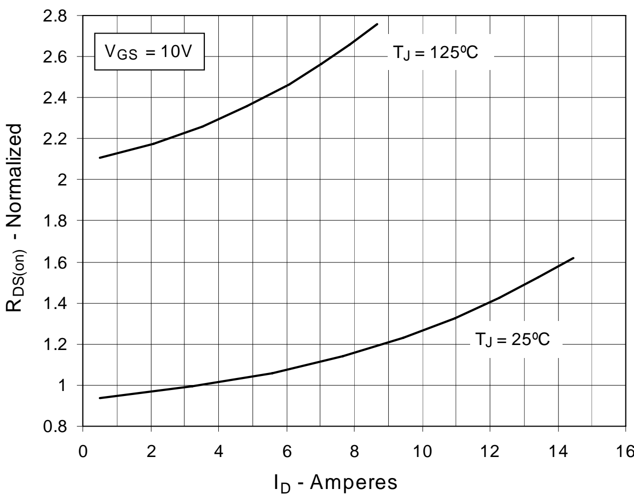
IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537











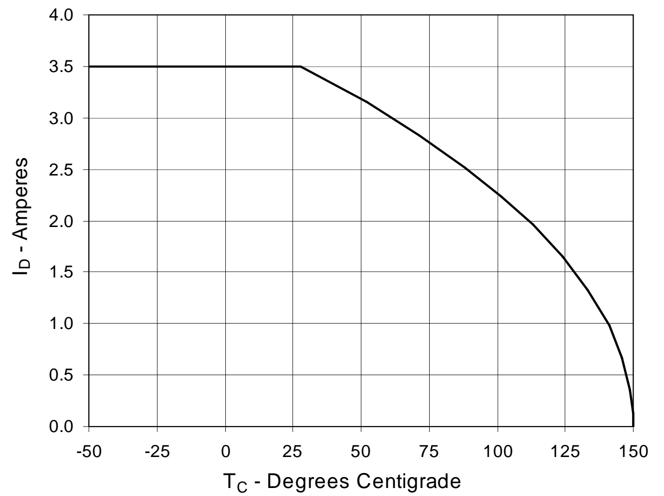


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Fig. 7. Input Admittance

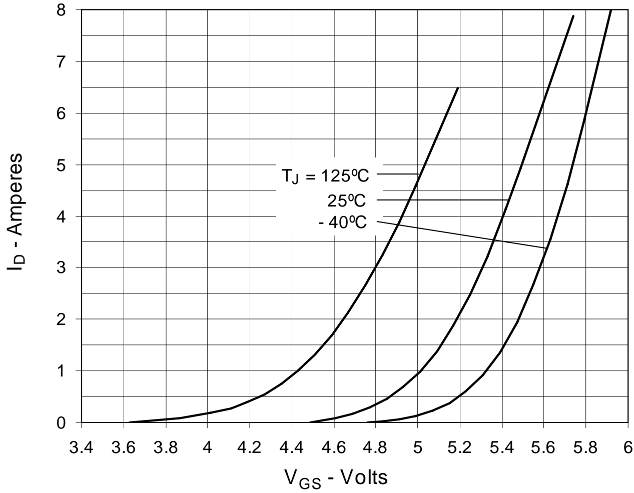


Fig. 8. Transconductance

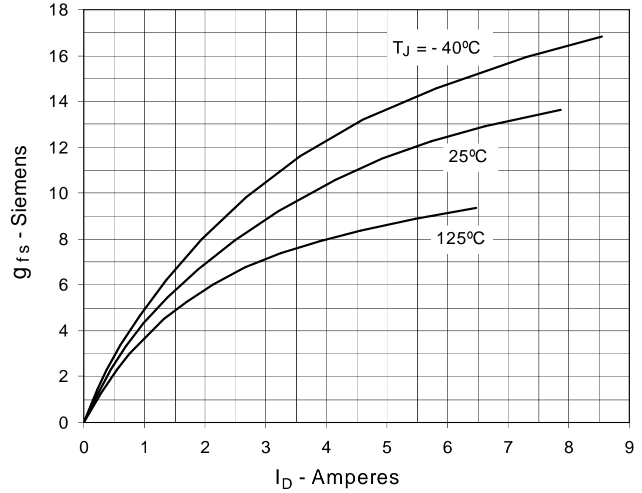


Fig. 9. Forward Voltage Drop of Intrinsic Diode

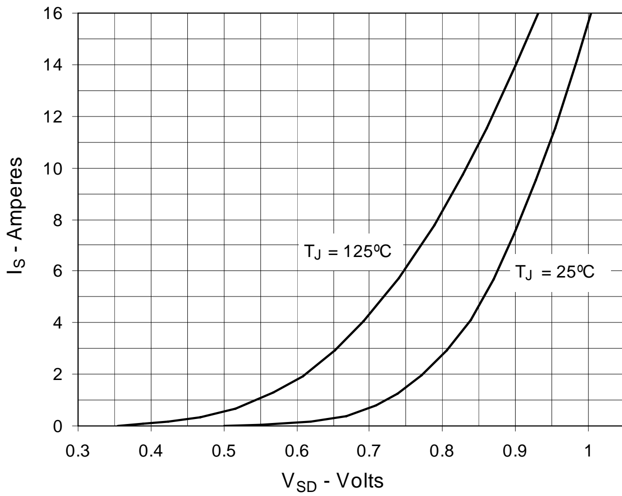


Fig. 10. Gate Charge

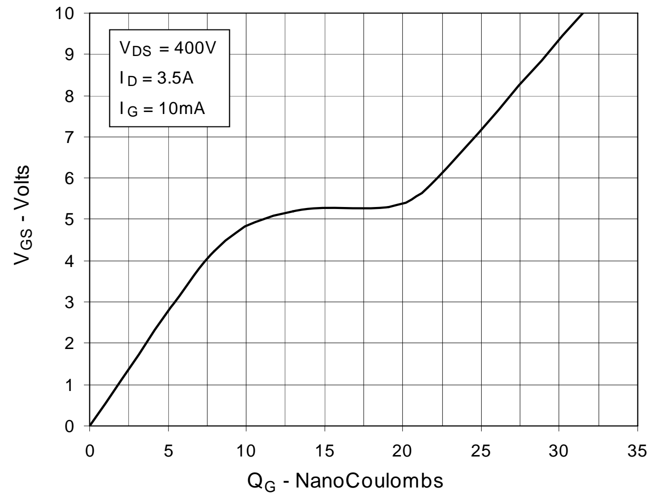


Fig. 11. Capacitance

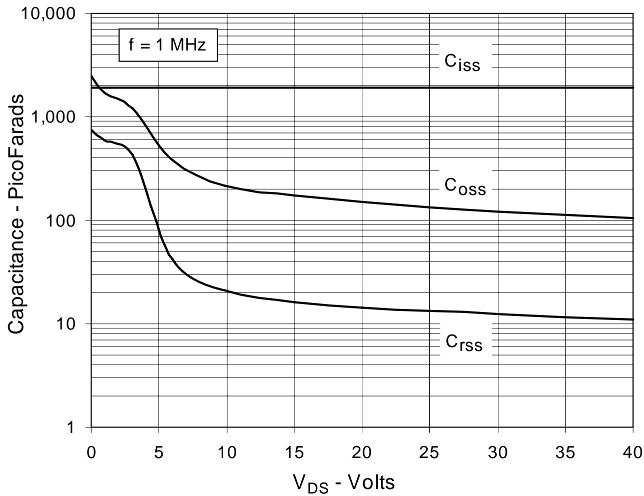
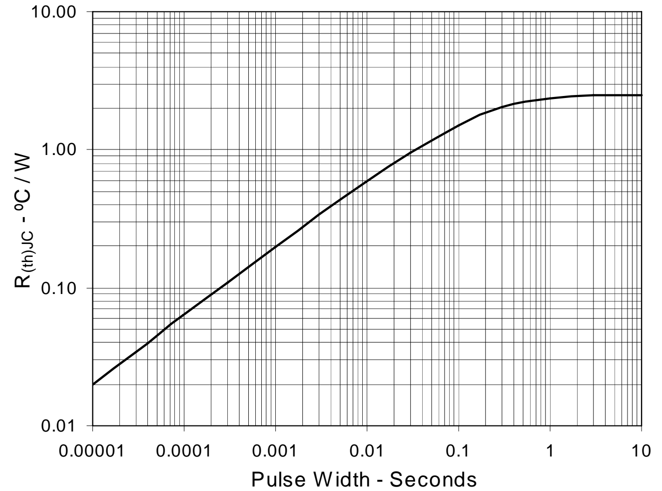


Fig. 12. Maximum Transient Thermal Resistance



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