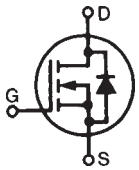
IXYS

PolarHV™ HiPerFET Power MOSFET
(Electrically Isolated Tab)

IXFP7N80PM

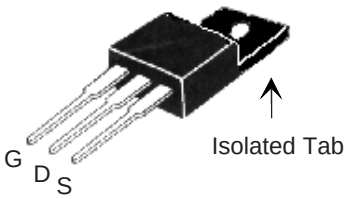
V_{DSS} = 800 V
I_{D25} = 3.5 A
$R_{DS(on)}$ ≤ 1.44 Ω
t_{rr} ≤ 250 ns

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	$I_S \le I_{DM}$, di/dt ≤ 100 A/μs, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$, 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}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			25	μA
	T_J = 125°C			500	μA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 3.5 A, Note 1			1.44	Ω

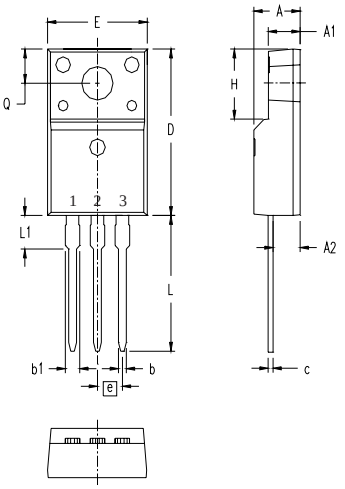
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; I_D = 3.5 A, Note 1	5	9.5		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1890		pF
C_{oss}			133		pF
C_{rss}			13		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 4 A R_G = 10 Ω (External)		28		ns
t_r			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

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, V_R = 100 V, V_{GS} = 0 V			250	ns
Q_{RM}			0.3		µC
I_{RM}			3		A

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

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

Fig. 1. Output Characteristics @ 25ºC

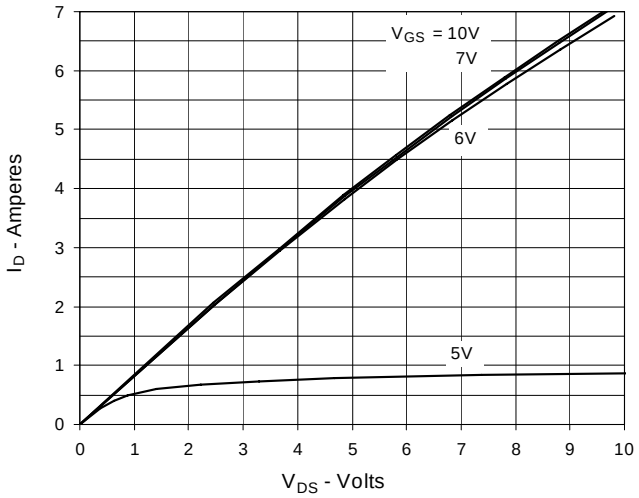


Fig. 2. Extended Output Characteristics @ 25ºC

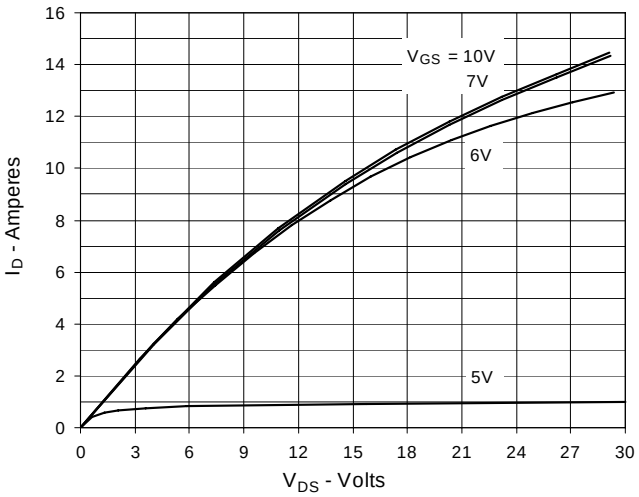


Fig. 3. Output Characteristics @ 125ºC

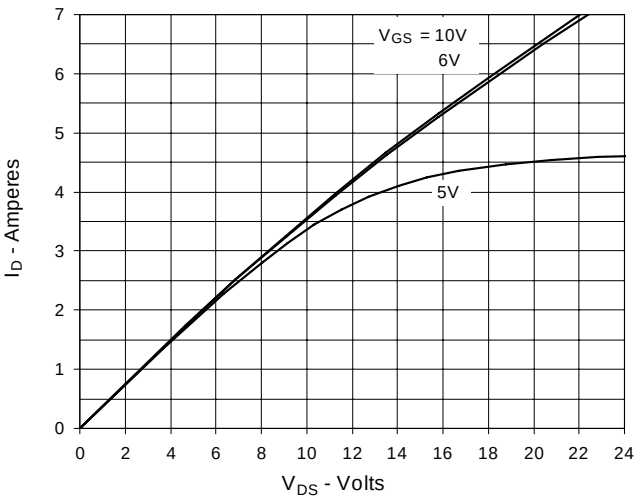


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 3.5A Value vs. Junction Temperature

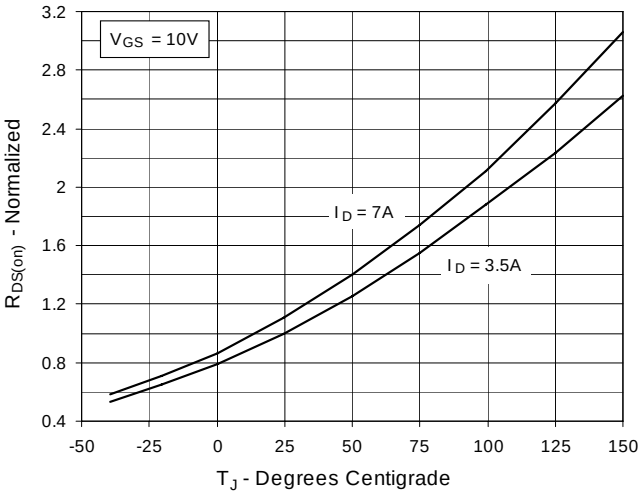


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 3.5A Value vs. Drain Current

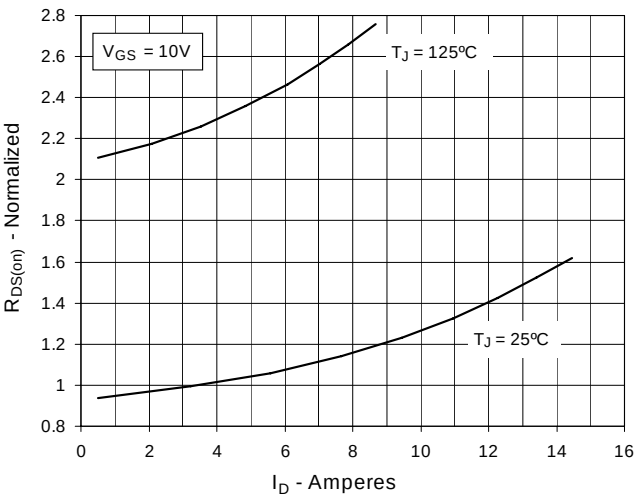


Fig. 6. Maximum Drain Current vs. Case Temperature

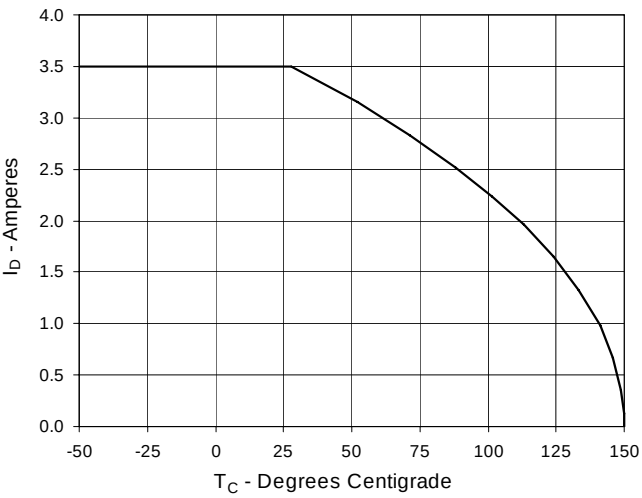


Fig. 7. Input Admittance

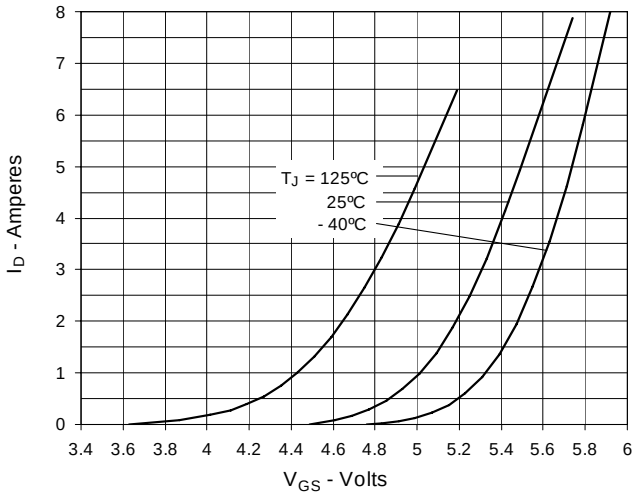


Fig. 8. Transconductance

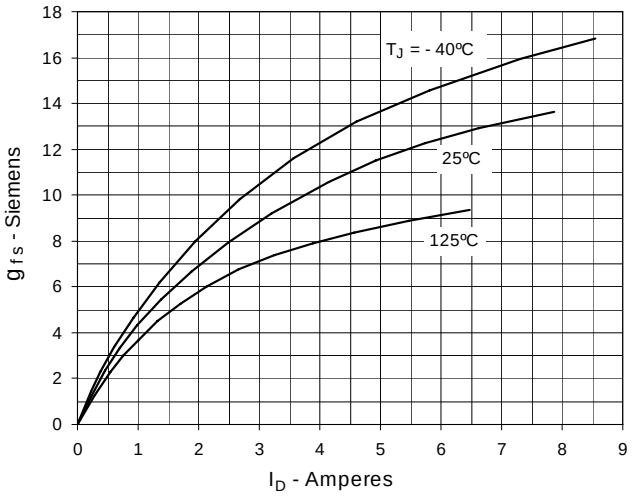


Fig. 9. Forward Voltage Drop of Intrinsic Diode

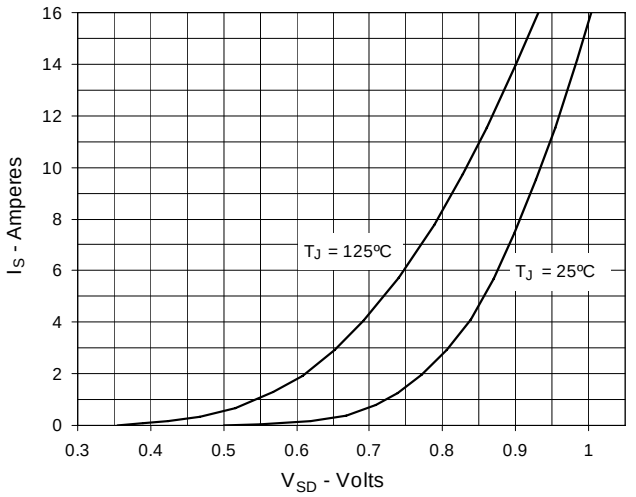


Fig. 10. Gate Charge

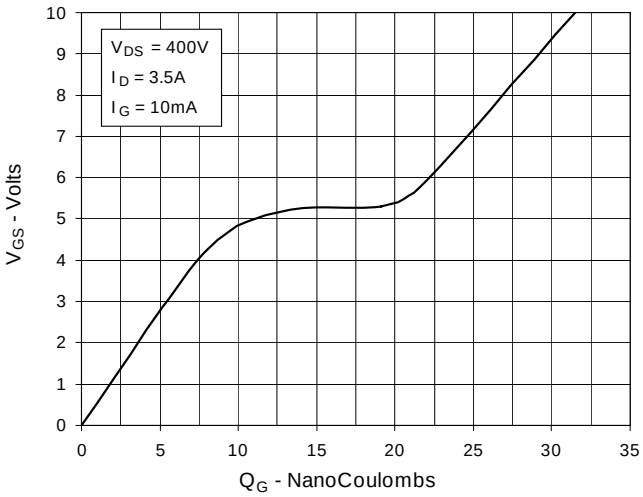


Fig. 11. Capacitance

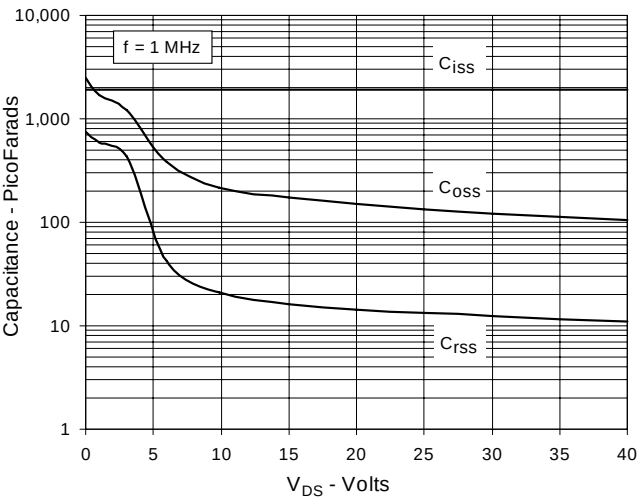


Fig. 12. Maximum Transient Thermal Resistance