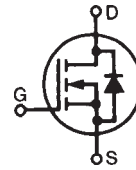


PolarHV™ HiPerFET Power MOSFET

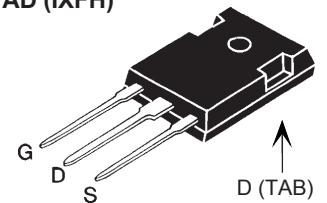
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

IXFH 22N50P
IXFV 22N50P
IXFV 22N50PS

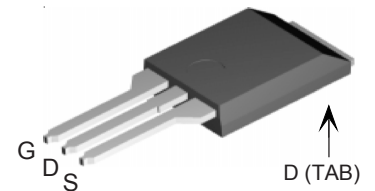
V_{DSS} = 500 V
I_{D25} = 22 A
R_{DS(on)} ≤ 270 mΩ
t_{rr} ≤ 200 ns



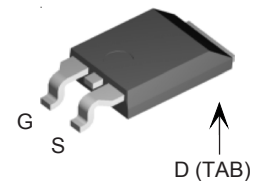
TO-247 AD (IXFH)



PLUS220 (IXFV)



PLUS220SMD (IXFV...S)



G = Gate D = Drain
S = Source TAB = Drain

Symbol	Test Conditions	Maximum Ratings	
V _{DSS}	T _J = 25°C to 150°C	500	V
V _{DGR}	T _J = 25°C to 150°C; R _{GS} = 1 MΩ	500	V
V _{GS}	Continuous	±30	V
V _{GSM}	Transient	±40	V
I _{D25}	T _C = 25°C	22	A
I _{DM}	T _C = 25°C, pulse width limited by T _{JM}	55	A
I _{AR}	T _C = 25°C	22	A
E _{AR}	T _C = 25°C	30	mJ
E _{AS}	T _C = 25°C	750	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	350	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	TO-247	6	g
	PLUS220 & PLUS220SMD	4	g

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	500		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 2.5 mA	3.0		5.5 V
I _{GSS}	V _{GS} = ±30 V _{DC} , V _{DS} = 0			±10 nA
I _{DSS}	V _{DS} = V _{DSS} V _{GS} = 0 V T _J = 125°C			5 μA 250 μA
R _{DS(on)}	V _{GS} = 10 V, I _D = 0.5 I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			270 mΩ

Features

- † International standard packages
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance
- easy to drive and to protect

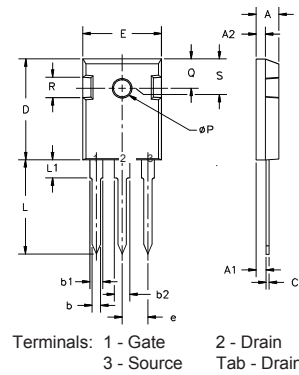
Advantages

- † Easy to mount
- † Space savings
- † High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{ V}; I_D = 0.5 I_{D25}$, pulse test		20	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		2630	pF
C_{oss}		310	pF	
C_{rss}		27	pF	
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_{D25}$ $R_G = 10\ \Omega$ (External)		22	ns
t_r		25	ns	
$t_{d(off)}$		72	ns	
t_f		21	ns	
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		50	nC
Q_{gs}		16	nC	
Q_{gd}		18	nC	
R_{thJC}	(TO-247 & PLUS220)		0.21	0.35°C/W $^\circ\text{C/W}$
R_{thCS}				

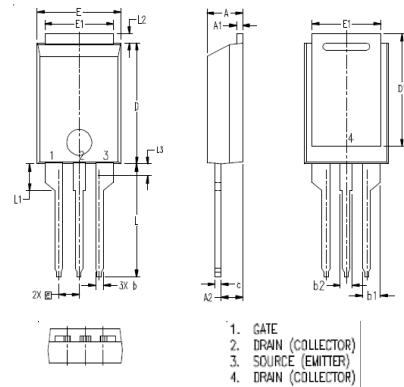
Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
Symbol	Test Conditions	Min.	Typ.	Max.	
I_S	$V_{GS} = 0\text{ V}$			22 A	
I_{SM}	Repetitive			55 A	
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V	
t_{rr}	$I_F = 22\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}, V_{GS} = 0\text{ V}$		0.7	200 ns	
Q_{RM}					μC
I_{RM}					A

TO-247 (IXFH) Outline



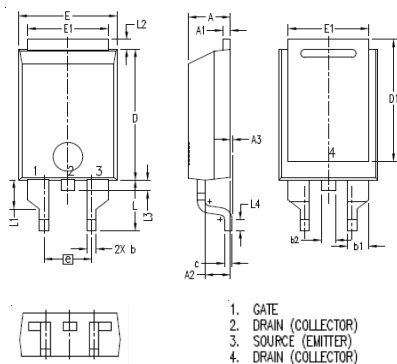
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L ₁		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

PLUS220 (IXFV) Outline



SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.169	.185	4.30	4.70
A ₁	.028	.035	0.70	0.90
A ₂	.098	.118	2.50	3.00
b	.035	.047	0.90	1.20
b ₁	.080	.095	2.03	2.41
b ₂	.054	.064	1.37	1.63
c	.028	.035	0.70	0.90
D	.551	.591	14.00	15.00
D ₁	.512	.539	13.00	13.70
E	.394	.433	10.00	11.00
E ₁	.331	.346	8.40	8.80
e	.100BSC		2.54 BSC	
L	.209	.228	5.30	5.80
L ₁	.118	.138	3.00	3.50
L ₂	.035	.051	0.90	1.30
L ₃	.047	.059	1.20	1.50

PLUS220SMD (IXFV...S) Outline



SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.169	.185	4.30	4.70
A ₁	.028	.035	0.70	0.90
A ₂	.098	.118	2.50	3.00
A ₃	.000	.010	0.00	0.25
b	.035	.047	0.90	1.20
b ₁	.080	.095	2.03	2.41
b ₂	.054	.064	1.37	1.63
c	.028	.035	0.70	0.90
D	.551	.591	14.00	15.00
D ₁	.512	.539	13.00	13.70
E	.394	.433	10.00	11.00
E ₁	.331	.346	8.40	8.80
e	.200BSC		5.08 BSC	
L	.209	.228	5.30	5.80
L ₁	.118	.138	3.00	3.50
L ₂	.035	.051	0.90	1.30
L ₃	.047	.059	1.20	1.50
L ₄	.039	.059	1.00	1.50

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

IXYS MOSFETs and IGBTs are covered by	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
one or more of the following U.S. patents:	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405B2	6,759,692
	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

Fig. 1. Output Characteristics
@ 25°C

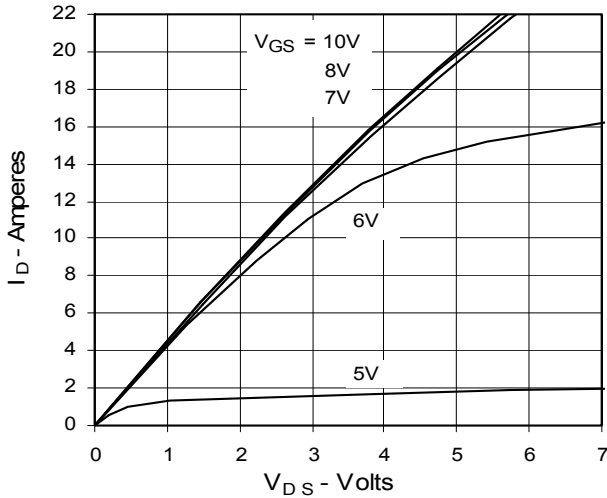


Fig. 2. Extended Output Characteristics
@ 25°C

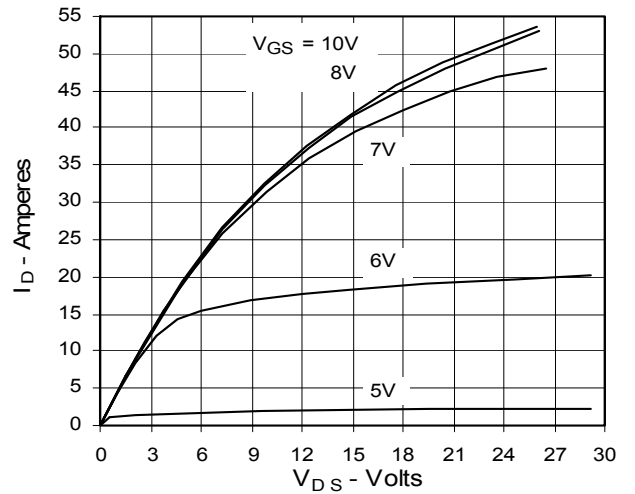


Fig. 3. Output Characteristics
@ 125°C

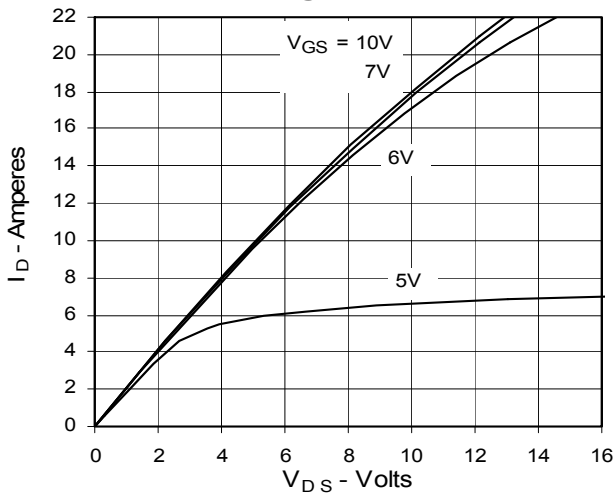


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

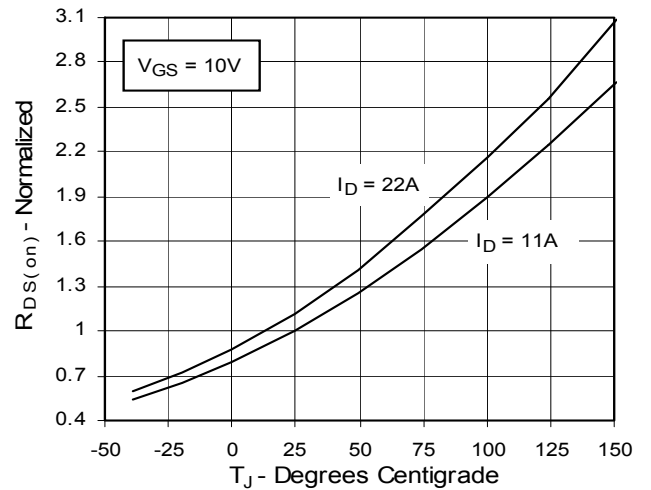


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

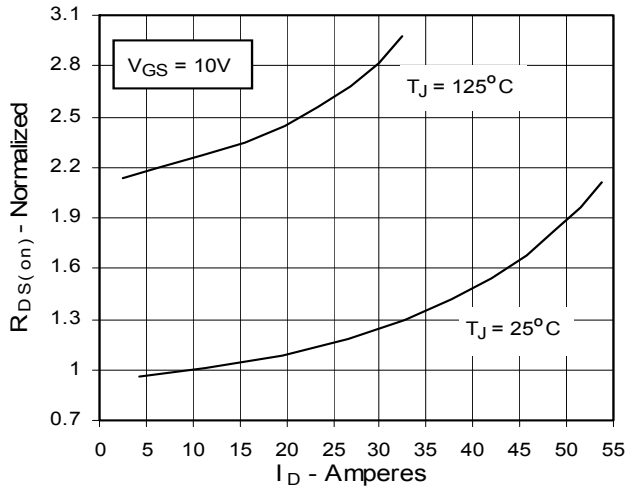


Fig. 6. Drain Current vs. Case Temperature

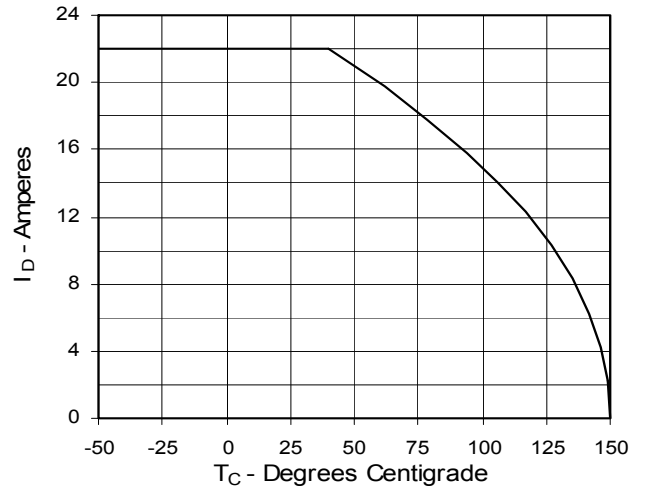


Fig. 7. Input Admittance

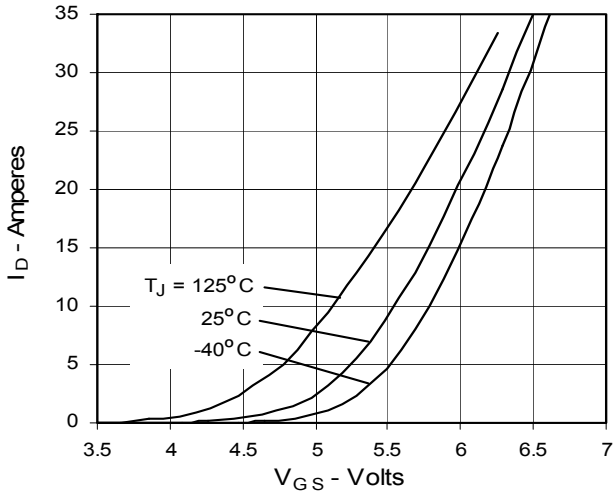


Fig. 8. Transconductance

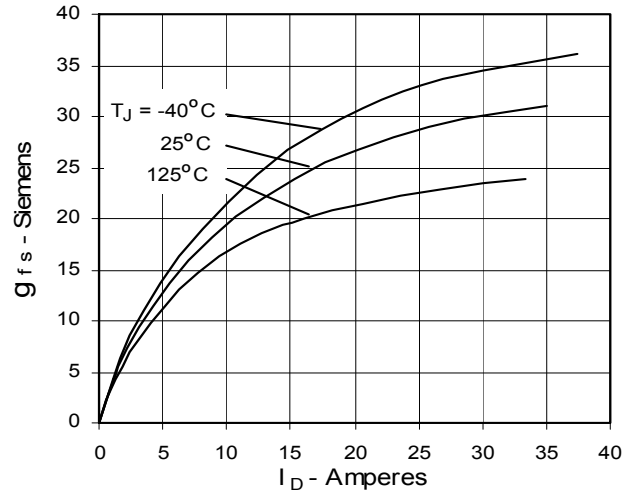


Fig. 9. Source Current vs. Source-To-Drain Voltage

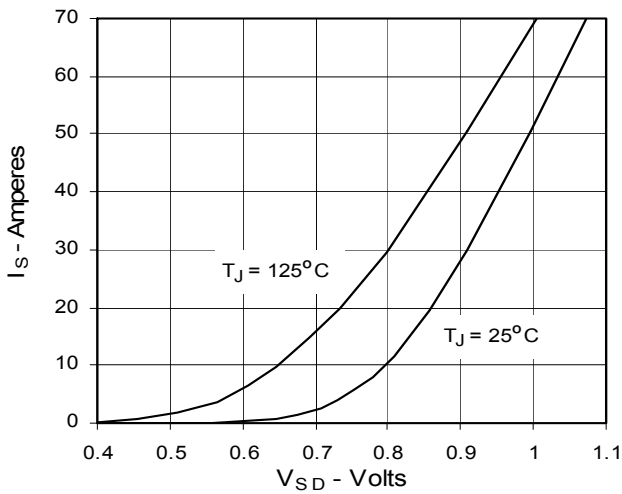


Fig. 10. Gate Charge

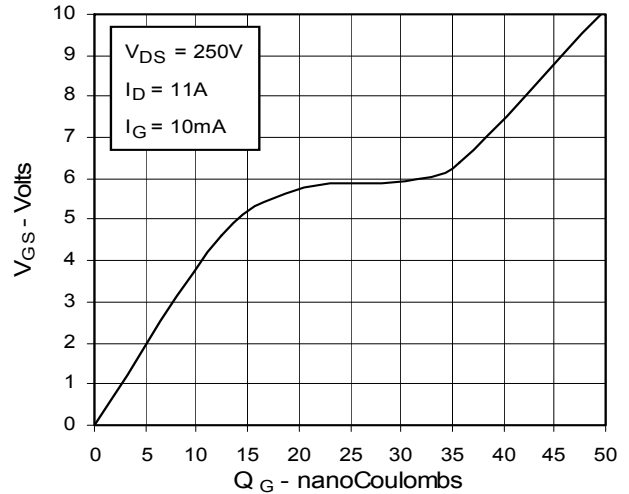


Fig. 11. Capacitance

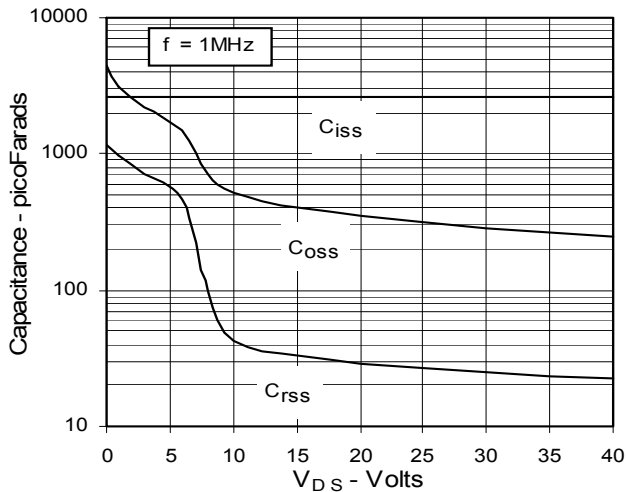


Fig. 12. Forward-Bias Safe Operating Area

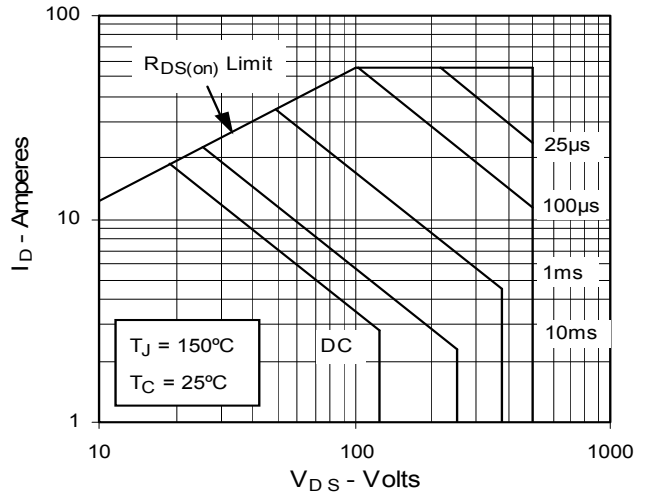


Fig. 13. Maximum Transient Thermal Resistance

