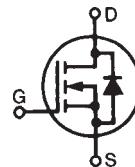
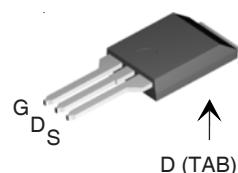


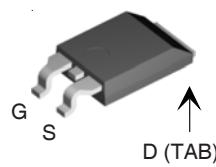
Polar™ Power MOSFET
HiPerFET™
IXFH12N90P
IXFV12N90P
IXFV12N90PS

 N-Channel Enhancement Mode
 Avalanche Rated
 Fast Intrinsic Diode

 V_{DSS} = 900V
 I_{D25} = 12A
 $R_{DS(on)}$ ≤ 900mΩ
 t_{rr} ≤ 300ns

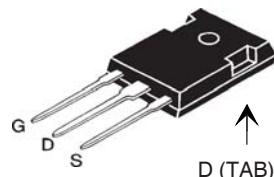
PLUS220 (IXFV)



PLUS220SMD (IXFV_S)



TO-247 (IXFH)


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

- International standard packages
- Avalanche Rated
- Low package inductance
- Fast intrinsic diode

Advantages

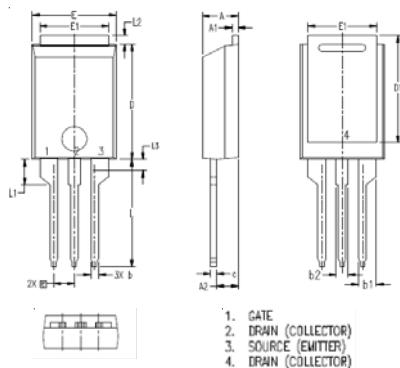
- Easy to mount
- Space savings
- High power density

Applications:

- Switched-mode and resonant-mode power supplies
- DC-DC Converters
- Laser Drivers
- AC and DC motor drives
- Robotics and servo controls

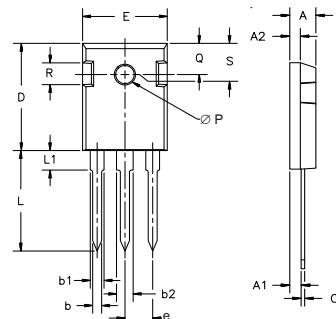
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V, I_D = 1\text{mA}$	900		V
$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 1\text{mA}$	3.5		6.5 V
I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$		± 100	nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$		25 μA 1 mA	
$R_{DS(on)}$	$V_{GS} = 10V, I_D = 0.5 \cdot I_{D25}$, Note 1		900 mΩ	

Symbol	Test Conditions (T _J = 25°C unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
G_{fs}	V _{DS} = 20V, I _D = 0.5 • I _{D25} , Note 1	5.0	8.2	S
R_{Gi}	Gate input resistance		1.7	Ω
C_{iss}	{ V _{GS} = 0V, V _{DS} = 25V, f = 1MHz }	3080		pF
C_{oss}		200		pF
C_{rss}		33		pF
t_{d(on)}	{ Resistive Switching Times V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} R _G = 2Ω (External) }	32		ns
t_r		34		ns
t_{d(off)}		50		ns
t_f		68		ns
Q_{g(on)}	{ V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} }	56		nC
Q_{gs}		18		nC
Q_{gd}		27		nC
R_{thJC}			0.33 °C/W	
R_{thCS}	(TO-247, PLUS220)	0.25		°C/W

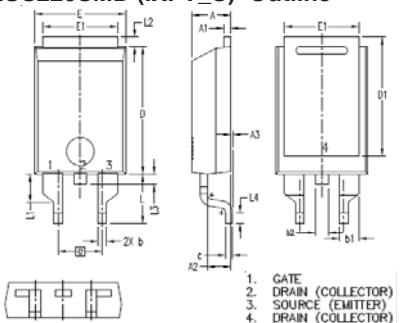
PLUS220 (IXFV) Outline


Source-Drain Diode		Characteristic Values		
	T _J = 25°C unless otherwise specified)	Min.	Typ.	Max.
I _s	V _{GS} = 0V		12	A
I _{SM}	Repetitive, pulse width limited by T _{JM}		48	A
V _{SD}	I _F = I _S , V _{GS} = 0V, Note 1		1.5	V
t _{rr}	{ I _F = 6A, -di/dt = 100A/μs V _R = 100V, V _{GS} = 0V }		300	ns
Q _{RM}		0.9		μC
I _{RM}		7.8		A

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

TO-247 (IXFH) Outline


Dim.	Millimeter Min. Max.	Inches 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	.205 .225
L	19.81 20.32	.780 .800
L1	4.50	.177
ØP	3.55 3.65	.140 .144
Q	5.89 6.40	.0232 .0252
R	4.32 5.49	.170 .216
S	6.15 BSC	.242 BSC

PLUS220SMD (IXFV-S) Outline


SYM	INCHES			MILLIMETER
	MIN	MAX	MIN	MAX
A	.169	.185	4.30	4.70
A1	.028	.035	.70	0.90
A2	.098	.118	2.50	3.00
A3	.000	.010	0.00	0.25
b	.035	.047	0.90	1.20
b1	.080	.095	2.03	2.41
b2	.054	.064	1.37	1.63
c	.028	.035	0.70	0.90
D	.551	.591	14.00	15.00
D1	.512	.539	13.00	13.70
E	.394	.433	10.00	11.00
E1	.331	.346	8.40	8.80
e	.200BSC	.205BSC	5.08	5.80
L	.209	.228	5.30	5.80
L1	.118	.138	3.00	3.50
L2	.035	.051	0.90	1.30
L3	.047	.059	1.20	1.50
L4	.039	.059	1.00	1.50

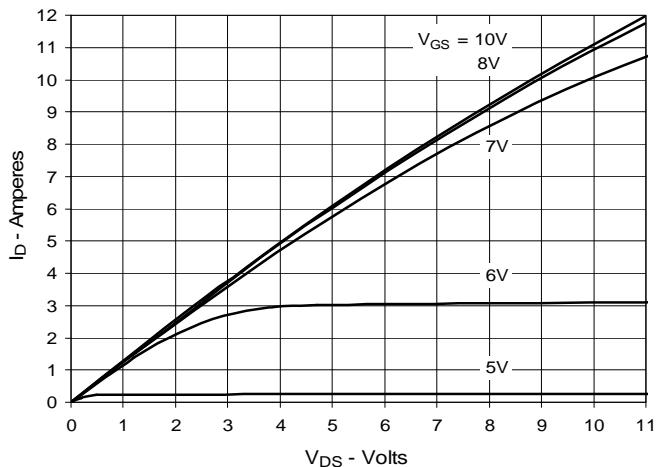
PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

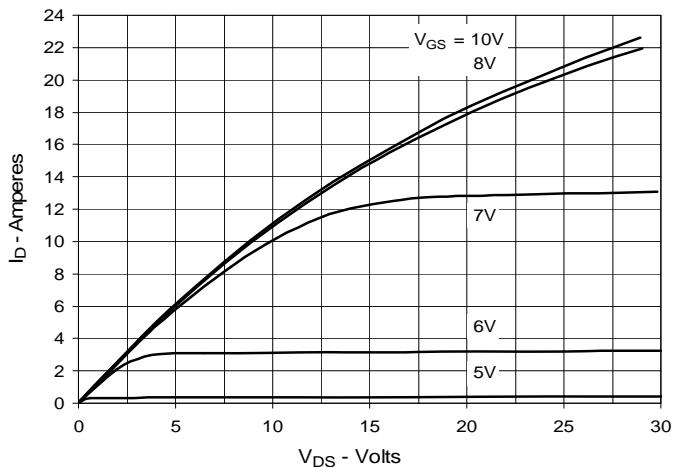
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 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

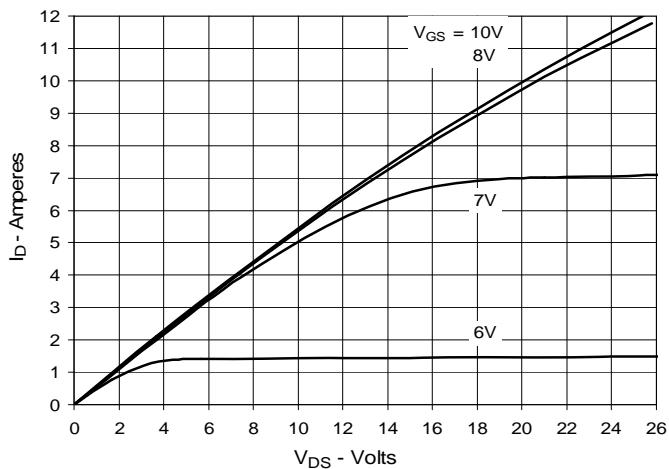
**Fig. 1. Output Characteristics
@ 25°C**



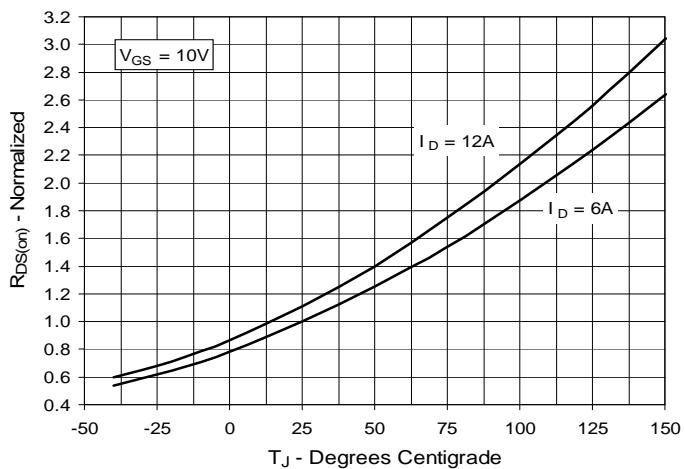
**Fig. 2. Extended Output Characteristics
@ 25°C**



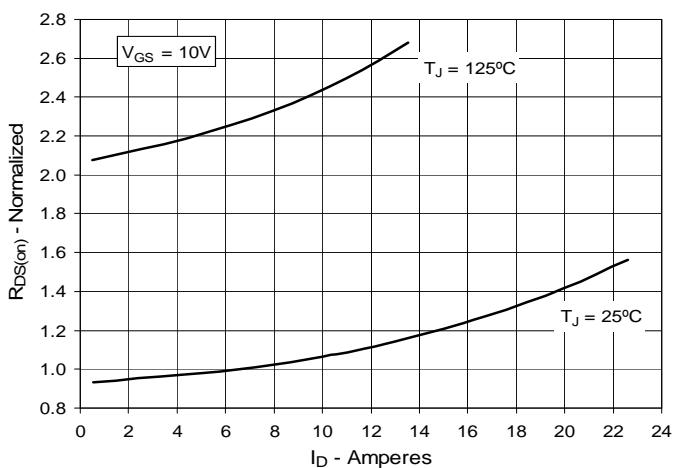
**Fig. 3. Output Characteristics
@ 125°C**



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 6A$ Value
vs. Junction Temperature**



**Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 6A$ Value
vs. Drain Current**



**Fig. 6. Maximum Drain Current vs.
Case Temperature**

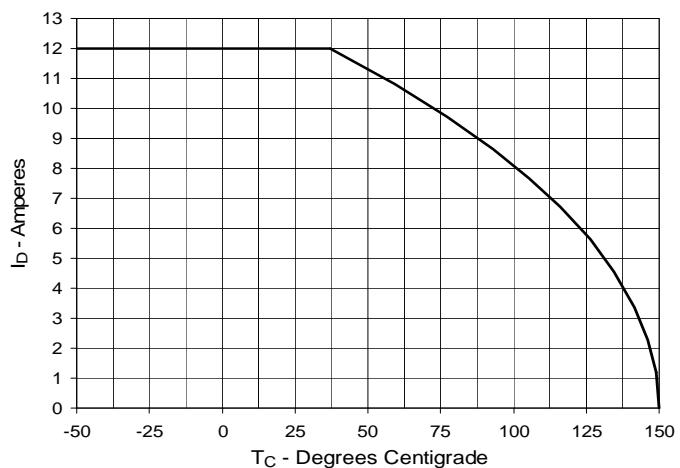
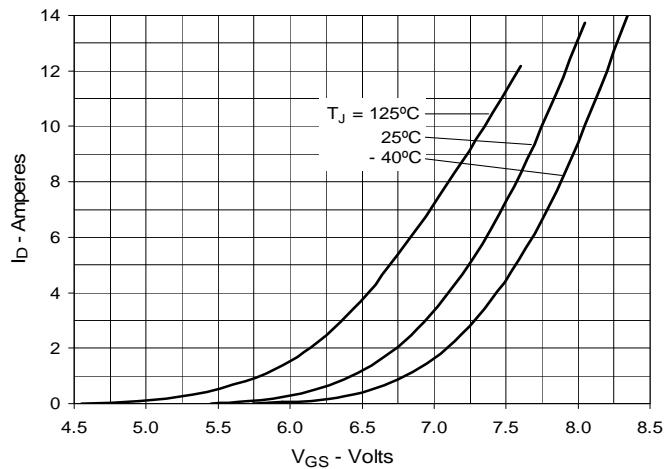
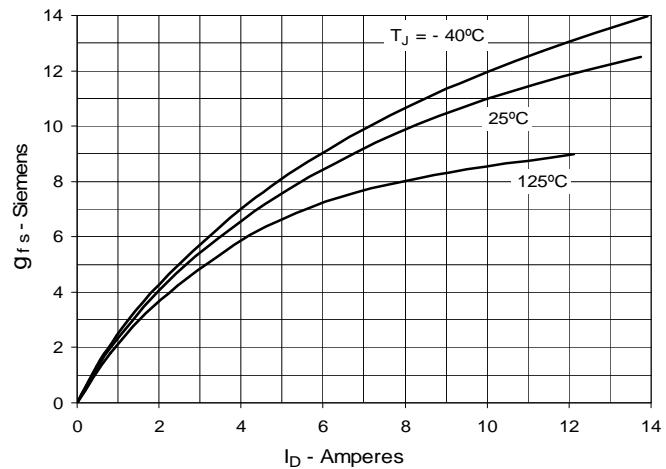
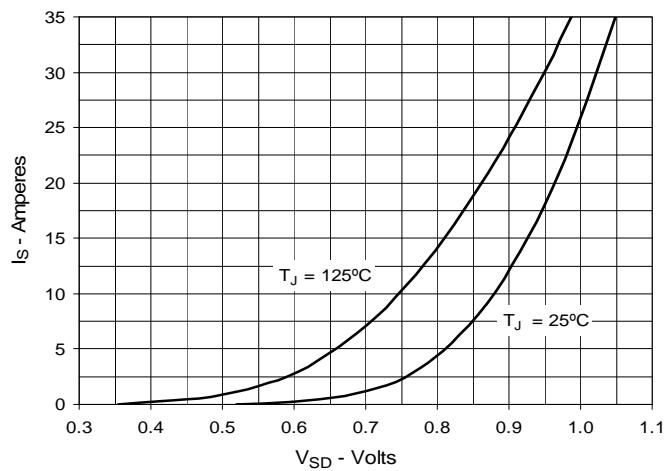
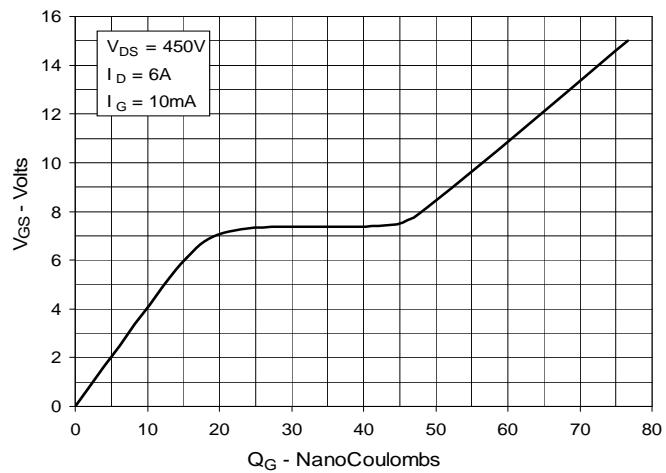
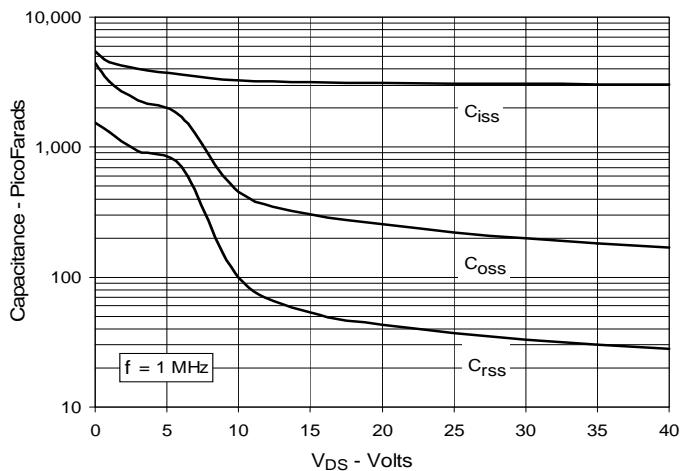


Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Maximum Transient Thermal Impedance
