

# Polar™ Power MOSFET HiPerFET™

N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode

**IXFH12N120P**  
**IXFV12N120P**  
**IXFV12N120PS**

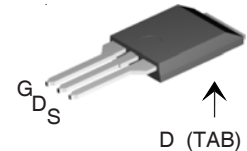


$V_{DSS} = 1200V$   
 $I_{D25} = 12A$   
 $R_{DS(on)} \leq 1.35\Omega$   
 $t_{rr} \leq 300ns$

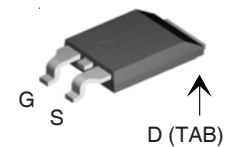
Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	1200	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$	1200	V
$V_{GSS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ C$	12	A
$I_{DM}$	$T_C = 25^\circ C$ , pulse width limited by $T_{JM}$	30	A
$I_A$	$T_C = 25^\circ C$	6	A
$E_{AS}$	$T_C = 25^\circ C$	500	mJ
$dV/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ C$	15	V/ns
$P_D$	$T_C = 25^\circ C$	543	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	Maximum lead temperature for soldering	300	$^\circ C$
$T_{SOLD}$	Plastic body for 10s	260	$^\circ C$
$M_d$	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
$F_C$	Mounting force (PLUS 220)	11..65 / 2.5..14.6	N/lb.
<b>Weight</b>	TO-247	6	g
	PLUS 220 types	4	g

Symbol	Test Conditions ( $T_J = 25^\circ C$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 1mA$	1200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 1mA$	3.5		6.5 V
$I_{GSS}$	$V_{GS} = \pm 30V$ , $V_{DS} = 0V$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 125^\circ C$			25 $\mu A$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1	1.15	1.35	$\Omega$

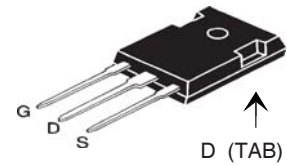
PLUS220 (IXFV)



PLUS220SMD (IXFV\_S)



TO-247 (IXFH)



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

## Features

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

## Advantages

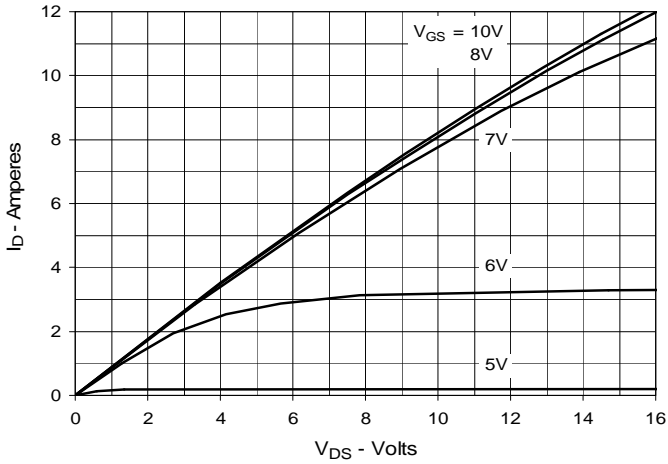
- Easy to mount
- Space savings
- High power density

## Applications:

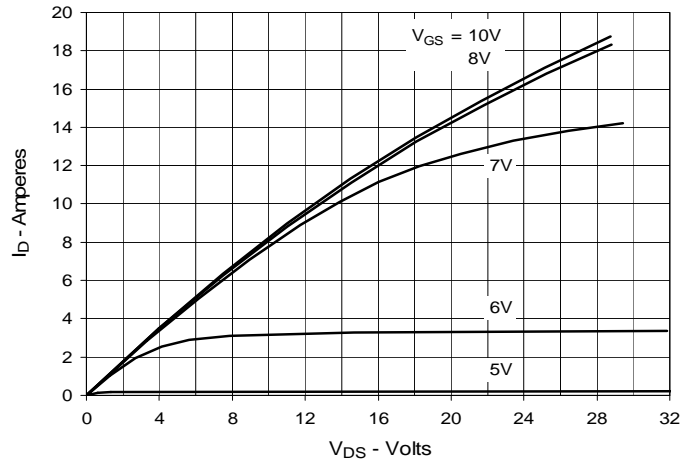
- High Voltage Switched-mode and resonant-mode power supplies
- High Voltage Pulse Power Applications
- High Voltage Discharge circuits in Lasers Pulsers, Spark Igniters, RF Generators
- High Voltage DC-DC converters
- High Voltage DC-AC inverters



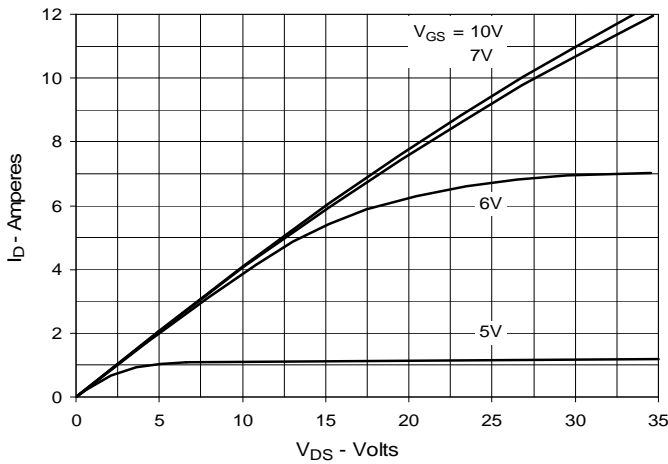
**Fig. 1. Output Characteristics @ 25°C**



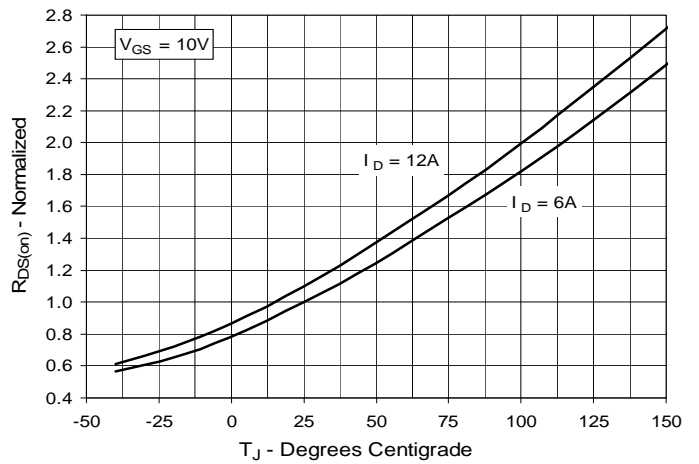
**Fig. 2. Extended Output Characteristics @ 25°C**



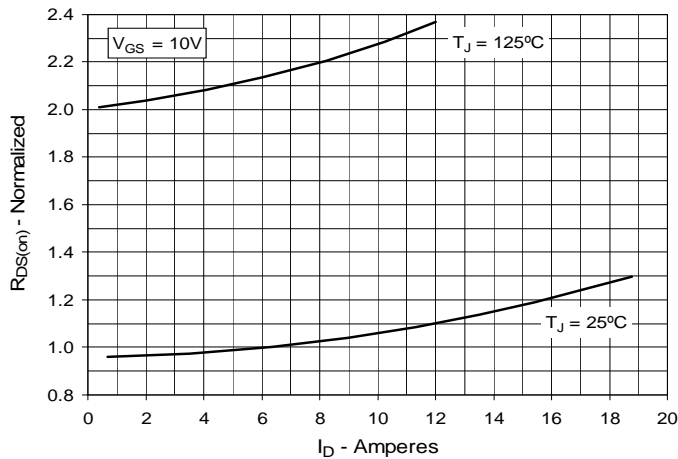
**Fig. 3. Output Characteristics @ 125°C**



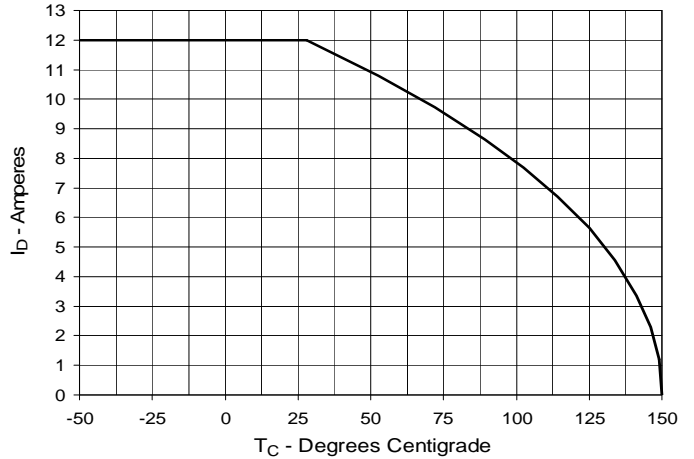
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 6A$  Value vs. Junction Temperature**



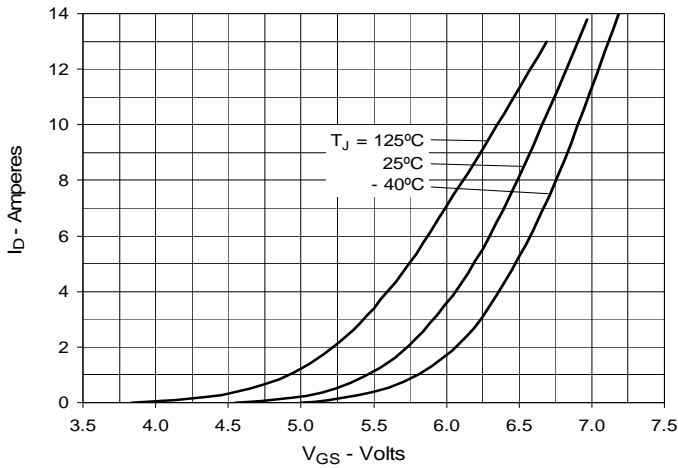
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 6A$  Value vs. Drain Current**



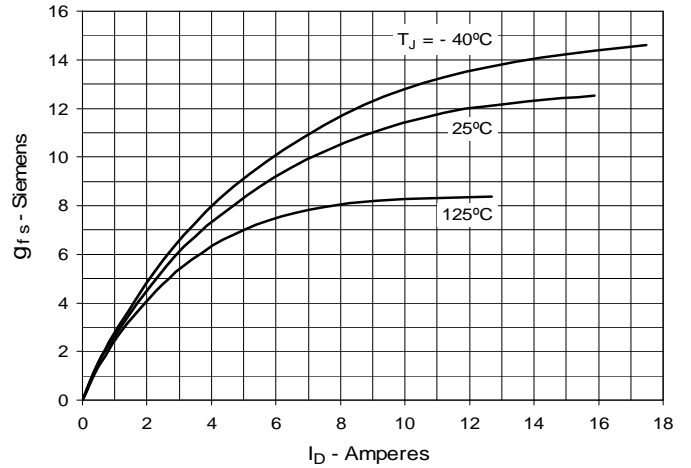
**Fig. 6. Maximum Drain Current vs. Case Temperature**



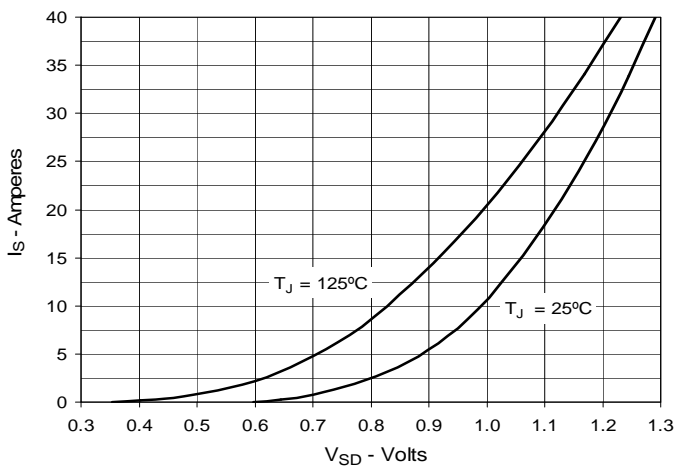
**Fig. 7. Input Admittance**



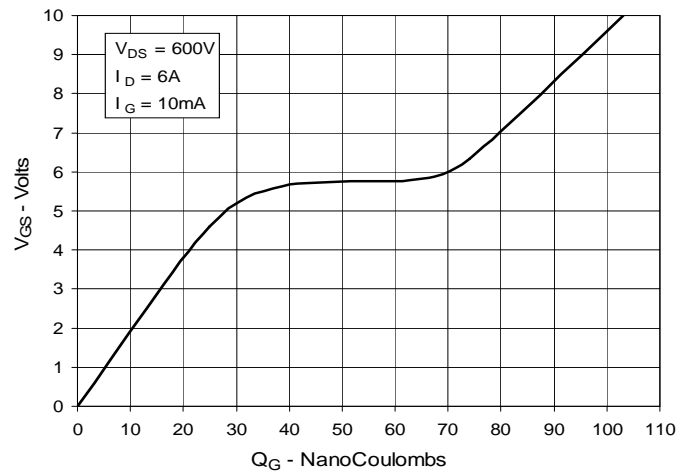
**Fig. 8. Transconductance**



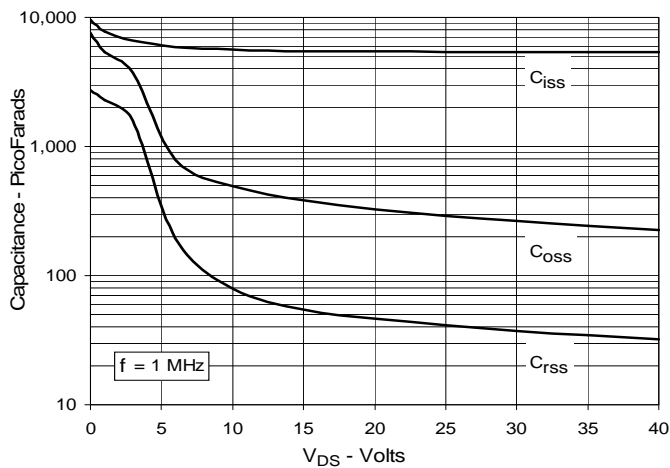
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



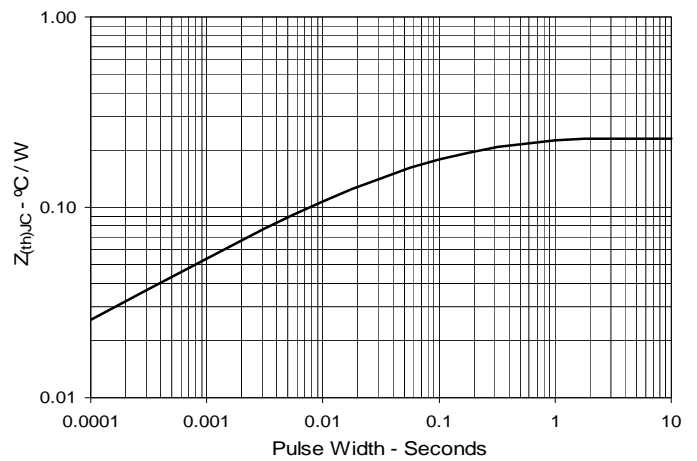
**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Maximum Transient Thermal Impedance**





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