

## PolarHV™ HiPerFET Power MOSFET

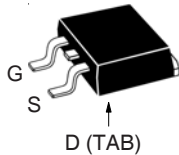
N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode

**IXFA10N80P**  
**IXFP10N80P**  
**IXFQ10N80P**  
**IXFH10N80P**

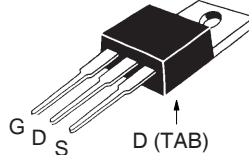


$V_{DSS} = 800V$   
 $I_{D25} = 10A$   
 $R_{DS(on)} \leq 1.1\Omega$   
 $t_{rr} \leq 250ns$

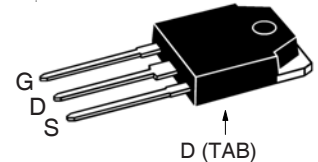
TO-263 AA (IXFA)



TO-220AB (IXFP)

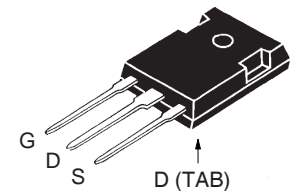


TO-3P (IXFQ)



Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	800	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$	800	V
$V_{GSS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ C$	10	A
$I_{DM}$	$T_C = 25^\circ C$ , Pulse Width Limited by $T_{JM}$	30	A
$I_A$	$T_C = 25^\circ C$	5	A
$E_{AS}$	$T_C = 25^\circ C$	600	mJ
$dV/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ C$	10	V/ns
$P_D$	$T_C = 25^\circ C$	300	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	1.6mm (0.062) from Case for 10s	300	$^\circ C$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ C$
$M_d$	Mounting Torque (TO-220, TO-247)	1.13 / 10	Nm/lb.in.
<b>Weight</b>	TO-263	2.5	g
	TO-220	3.0	g
	TO-3P	5.5	g
	TO-247	6.0	g

TO-247 (IXFH)



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

### Features

- International Standard Packages
- Avalanche Rated
- Low Package Inductance
- Easy to Drive and to Protect

### 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 ( $T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 250\mu A$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 2.5mA$	3.0		V
$I_{GSS}$	$V_{GS} = \pm 30V$ , $V_{DS} = 0V$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 150^\circ C$			25 $\mu A$
				500 $\mu A$
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1			1.1 $\Omega$

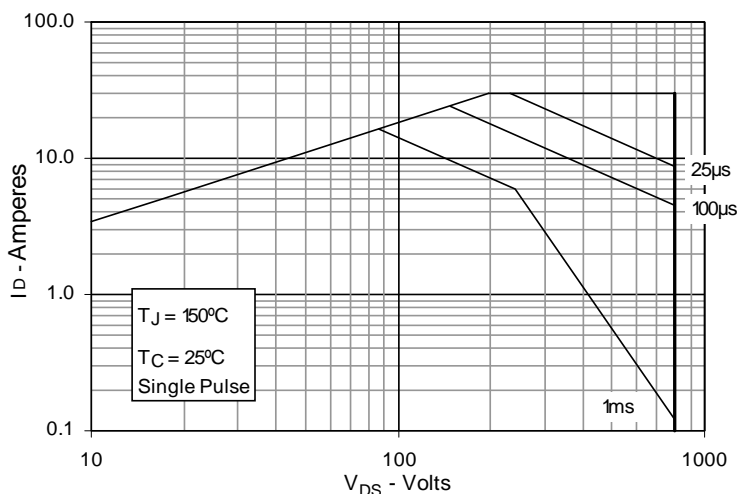
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
$g_{fs}$	$V_{DS} = 20\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1	7	11	S
$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		2050	pF
$C_{oss}$			172	pF
$C_{rss}$			16	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$ $R_G = 5\Omega$ (External)		21	ns
$t_r$			22	ns
$t_{d(off)}$			62	ns
$t_f$			22	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$		40	nC
$Q_{gs}$			12	nC
$Q_{gd}$			14	nC
$R_{thJC}$				0.42 $^\circ\text{C/W}$
$R_{thCS}$	(TO-220)		0.50	$^\circ\text{C/W}$
$R_{thCS}$	(TO-247 & TO-3P)		0.25	$^\circ\text{C/W}$

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
$I_S$	$V_{GS} = 0\text{V}$			10 A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			30 A
$V_{SD}$	$I_F = I_S$ , $V_{GS} = 0\text{V}$ , Note 1			1.5 V
$t_{rr}$	$I_F = 10\text{A}$ , $V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$		200	250 ns
$I_{RM}$			3.0	A
$Q_{RM}$			0.6	$\mu\text{C}$

Note 1. Pulse test,  $t \leq 300 \mu\text{s}$ , duty cycle  $d \leq 2\%$

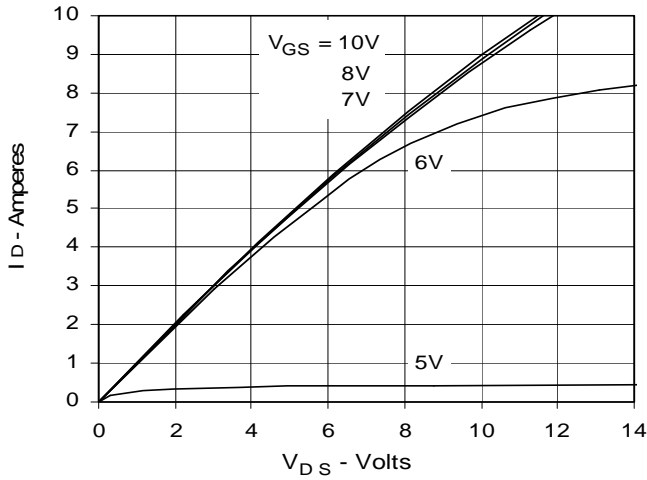
Fig. 1. Forward-Bias Safe Operating Area



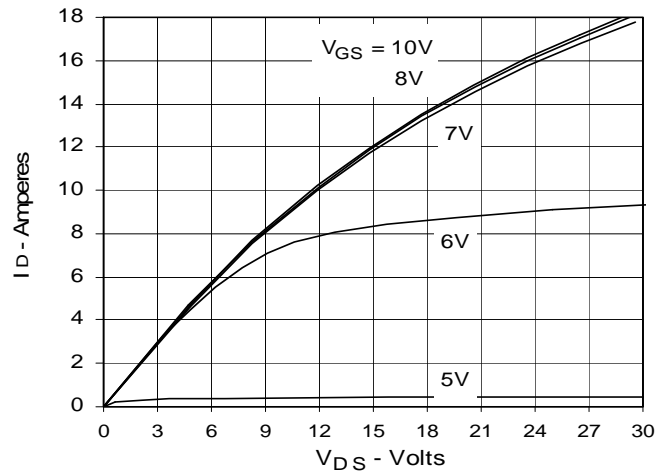
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

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	7,157,338 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	

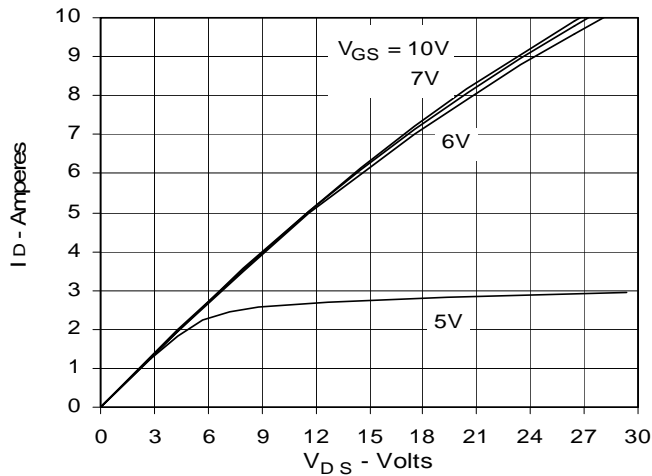
**Fig. 2. Output Characteristics**  
@ 25°C



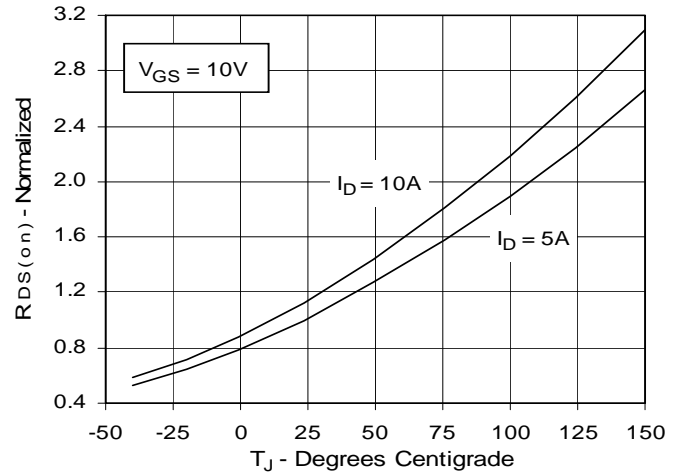
**Fig. 3. Extended Output Characteristics**  
@ 25°C



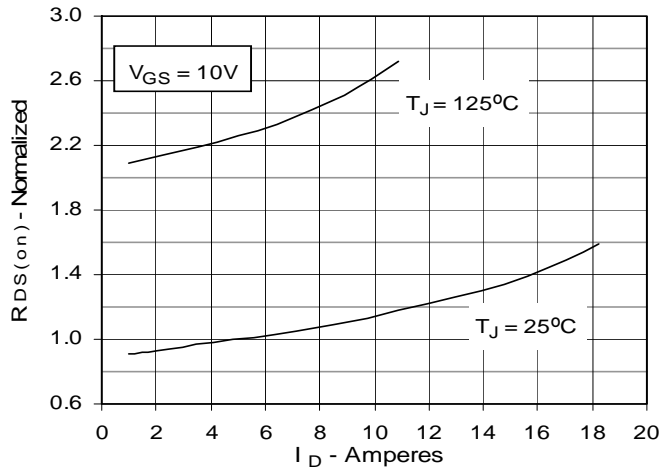
**Fig. 4. Output Characteristics**  
@ 125°C



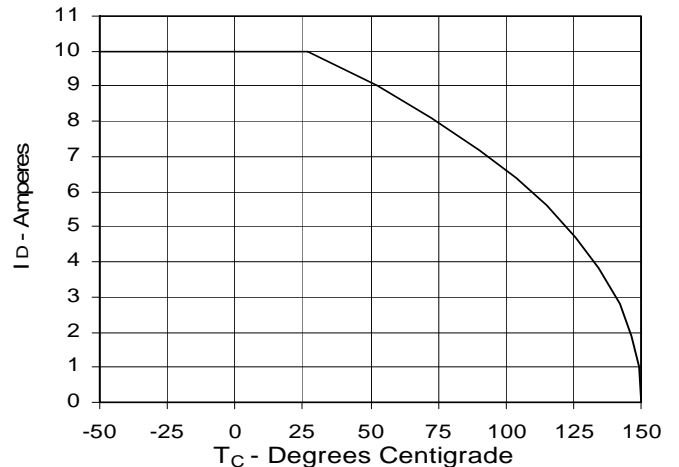
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



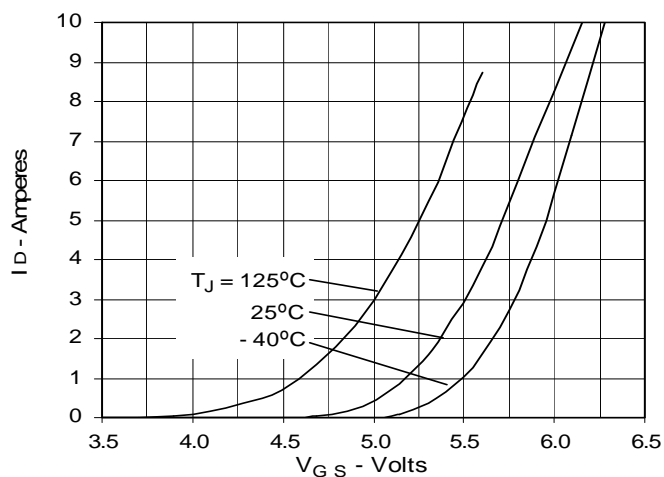
**Fig. 6.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs.  $I_D$**



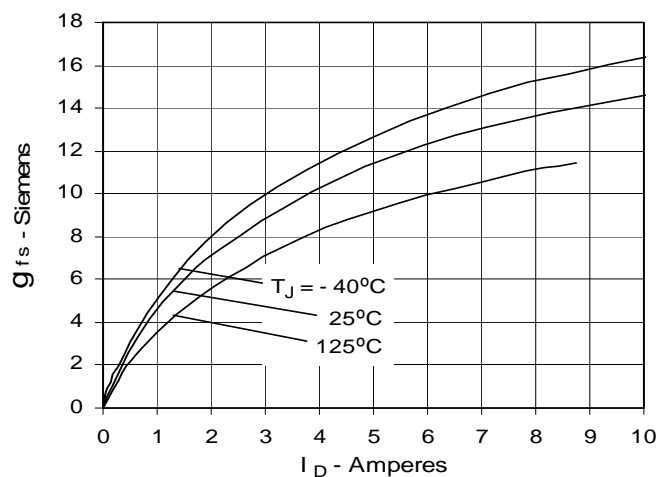
**Fig. 7. Drain Current vs. Case Temperature**



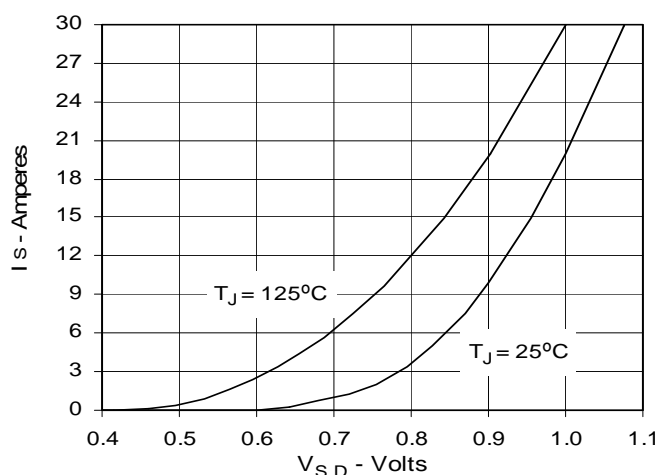
**Fig. 8. Input Admittance**



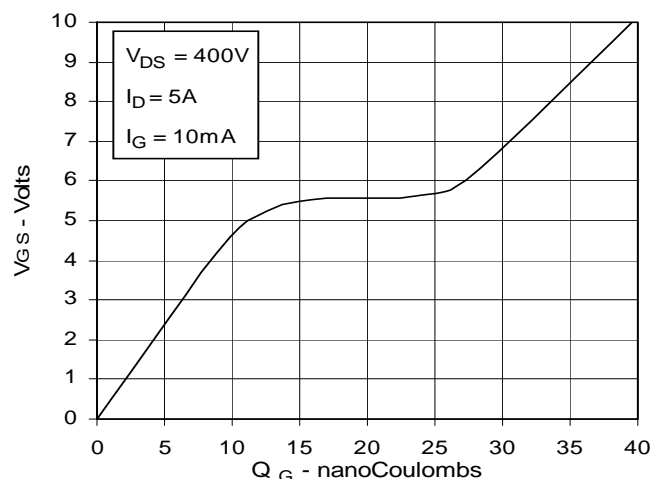
**Fig. 9. Transconductance**



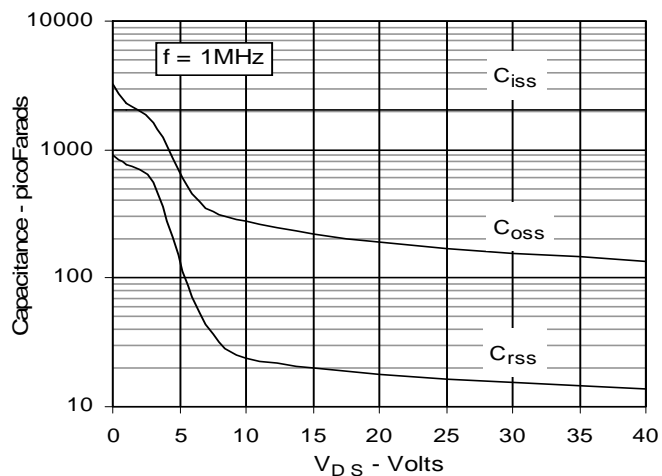
**Fig. 10. Source Current vs. Source-To-Drain Voltage**



**Fig. 11. Gate Charge**



**Fig. 12. Capacitance**



**Fig. 13. Maximum Transient Thermal Impedance**

