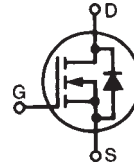


# Polar™ HiPerFET Power MOSFET

# IXFK 200N10P IXFX 200N10P

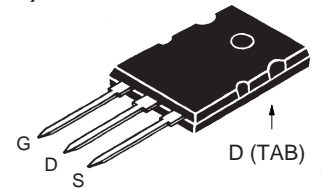
N-Channel Enhancement Mode  
Fast Intrinsic Diode  
Avalanche Rated



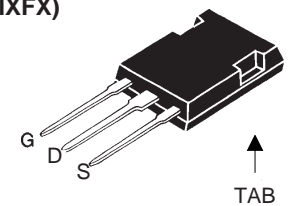
$V_{DSS} = 100 \text{ V}$   
 $I_{D25} = 200 \text{ A}$   
 $R_{DS(on)} \leq 7.5 \text{ m}\Omega$   
 $t_{rr} \leq 150 \text{ ns}$

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$	100	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	100	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	200	A
$I_{D(RMS)}$	External lead current limit	75	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	400	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	60	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	100	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	4	J
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 4 \Omega$	10	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	830	W
$T_J$		-55 ... +175	$^\circ\text{C}$
$T_{JM}$		175	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic body for 10 s	260	$^\circ\text{C}$
$M_d$	Mounting torque TO-264	0.9/6	Nm/lb.in
$F_c$	Mounting force PLUS247	20 120/45 26	Nm/lb.in
<b>Weight</b>	TO-264	10	g
	PLUS247	6	g

TO-264 (IXFK)



PLUS247 (IXFX)



G = Gate      D = Drain  
S = Source      Tab = Drain

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$	3.0		5.0 V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$			$\pm 100 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $T_J = 150^\circ\text{C}$ $T_J = 175^\circ\text{C}$			25 $\mu\text{A}$ 500 $\mu\text{A}$ 2.5 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$ $V_{GS} = 15 \text{ V}$ , $I_D = 400 \text{ A}$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2 \%$	5.5		7.5 $\text{m}\Omega$ m $\Omega$

## Features

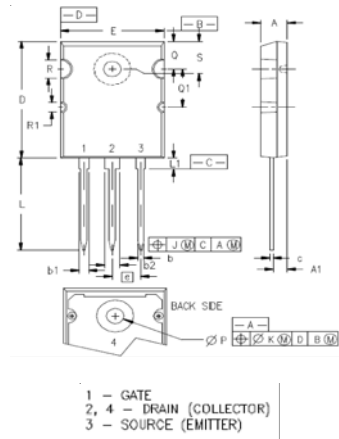
- † International standard packages
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance
- easy to drive and to protect

## Advantages

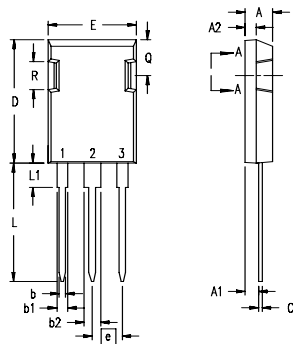
- † Easy to mount
- † Space savings
- † High power density

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ , pulse test	60	97	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		7600	pF
$C_{oss}$			2900	pF
$C_{rss}$			860	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 60\text{ A}$ $R_G = 3.3\ \Omega$ (External)		30	ns
$t_r$			35	ns
$t_{d(off)}$			150	ns
$t_f$			90	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		235	nC
$Q_{gs}$			50	nC
$Q_{gd}$			135	nC
$R_{thJC}$ $R_{thCS}$	TO-264 and PLUS247	0.15		0.18°C/W °C/W

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{ V}$			200 A
$I_{SM}$	Repetitive			400 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
$t_{rr}$	$I_F = 25\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 50\text{ V}, V_{GS} = 0\text{ V}$			150 ns
$Q_{RM}$			0.4	$\mu\text{C}$
$I_{RM}$			6	A

**TO-264 (IXFK) Outline**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215 BSC		5.46 BSC	
J	.000	.010	0.00	0.25
K	.000	.010	0.00	0.25
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
ØP	.122	.138	3.10	3.51
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36
S	.243	.253	6.17	6.43

**PLUS 247™ (IXFX) Outline**


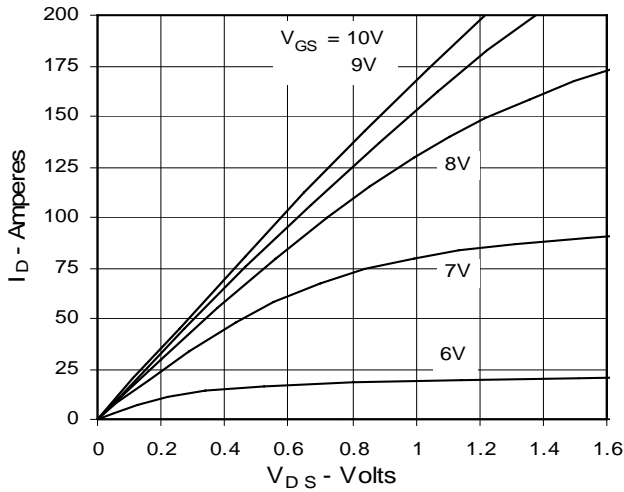
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

Terminals: 1 - Gate  
2 - Drain (Collector)  
3 - Source (Emitter)  
4 - Drain (Collector)

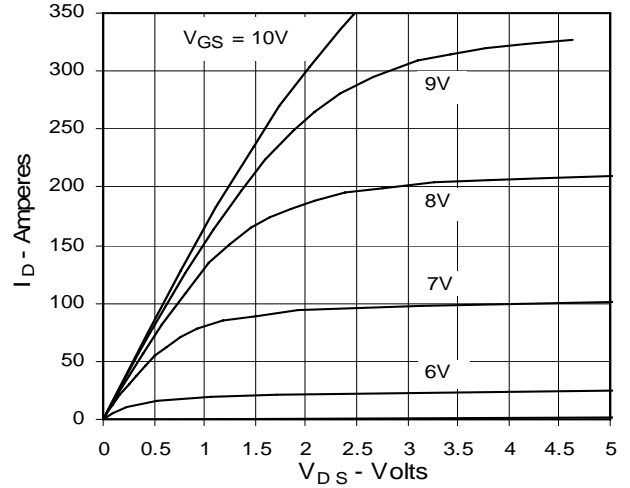
IXYS reserves the right to change limits, test conditions, and dimensions.

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

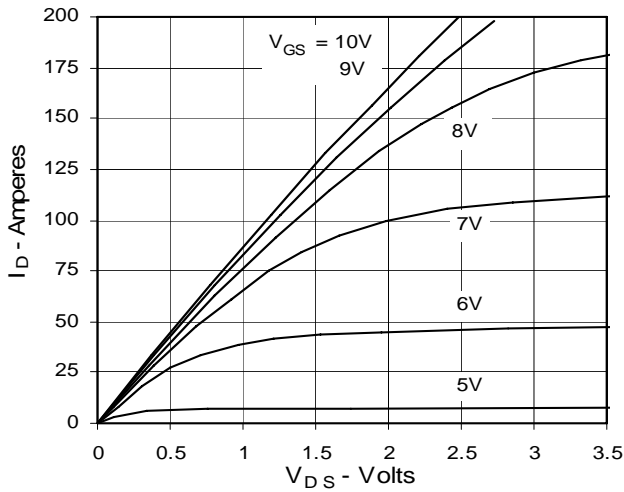
**Fig. 1. Output Characteristics**  
**@ 25°C**



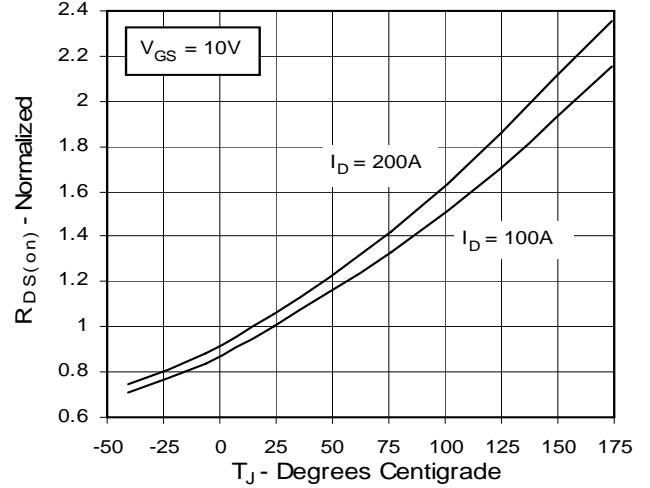
**Fig. 2. Extended Output Characteristics**  
**@ 25°C**



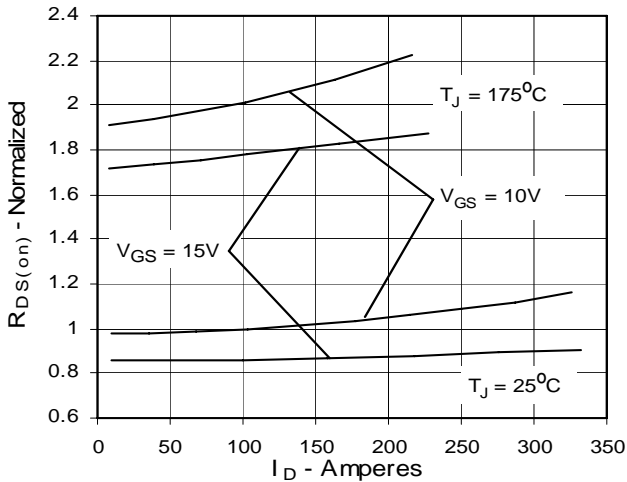
**Fig. 3. Output Characteristics**  
**@ 150°C**



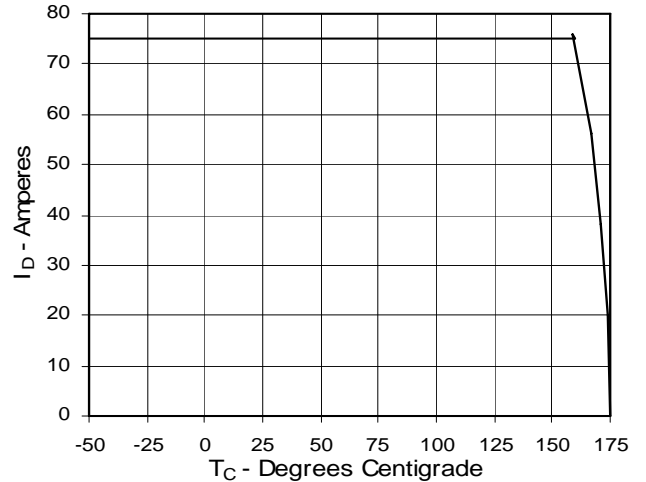
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$**   
**Value vs. Junction Temperature**



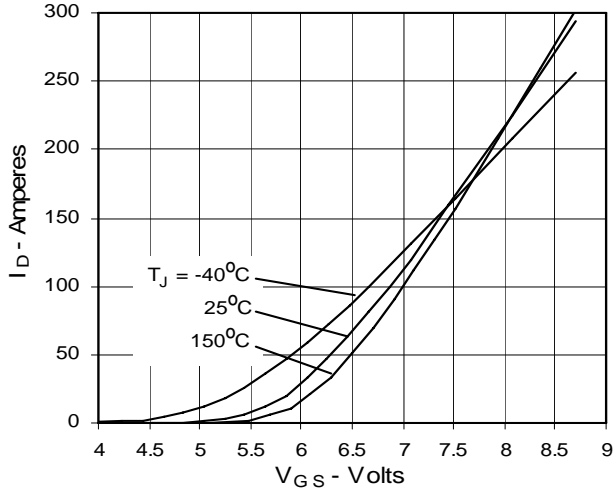
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$**   
**Value vs. Drain Current**



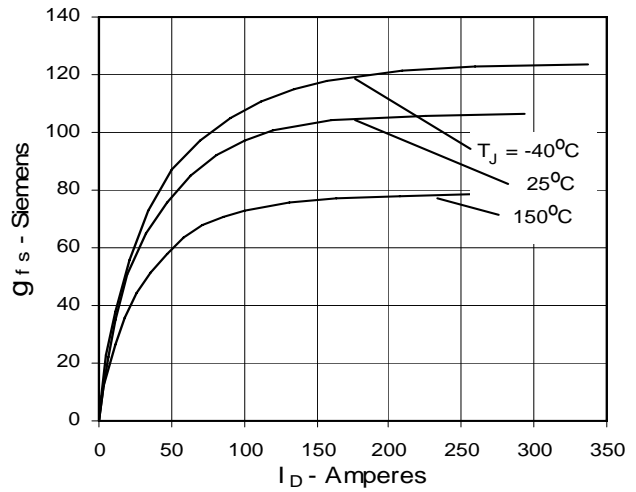
**Fig. 6. Drain Current vs. Case Temperature**



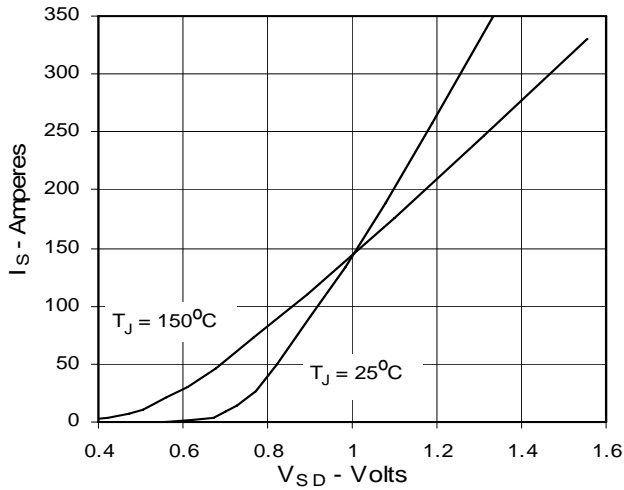
**Fig. 7. Input Admittance**



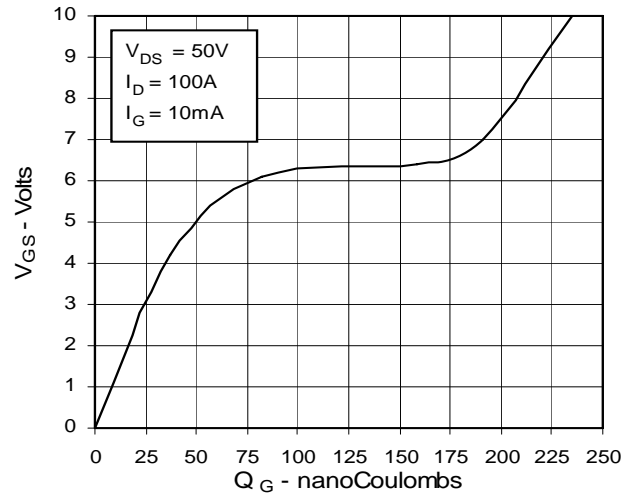
**Fig. 8. Transconductance**



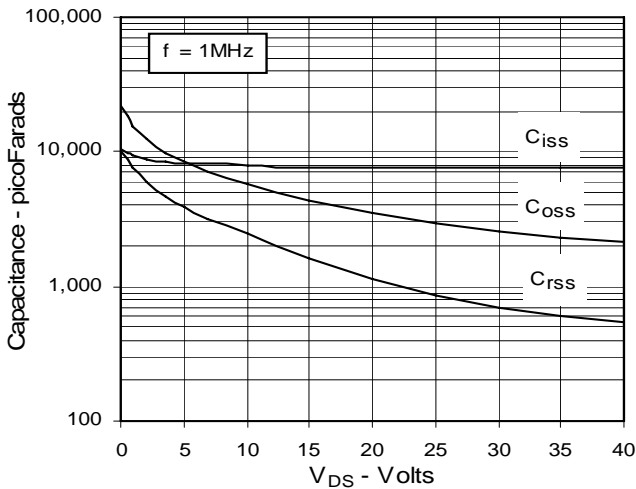
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Forward-Bias Safe Operating Area**

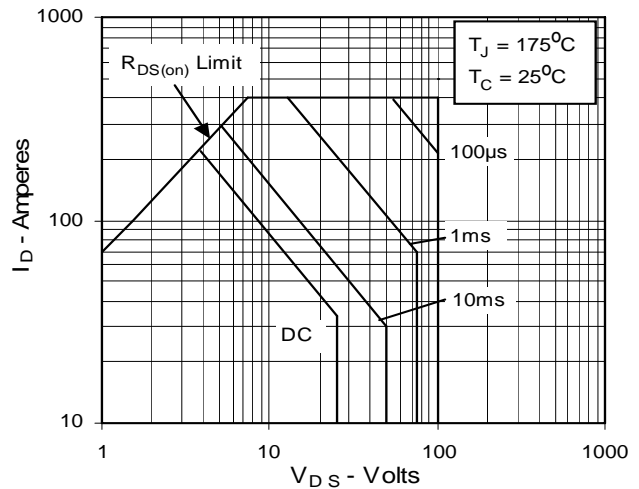
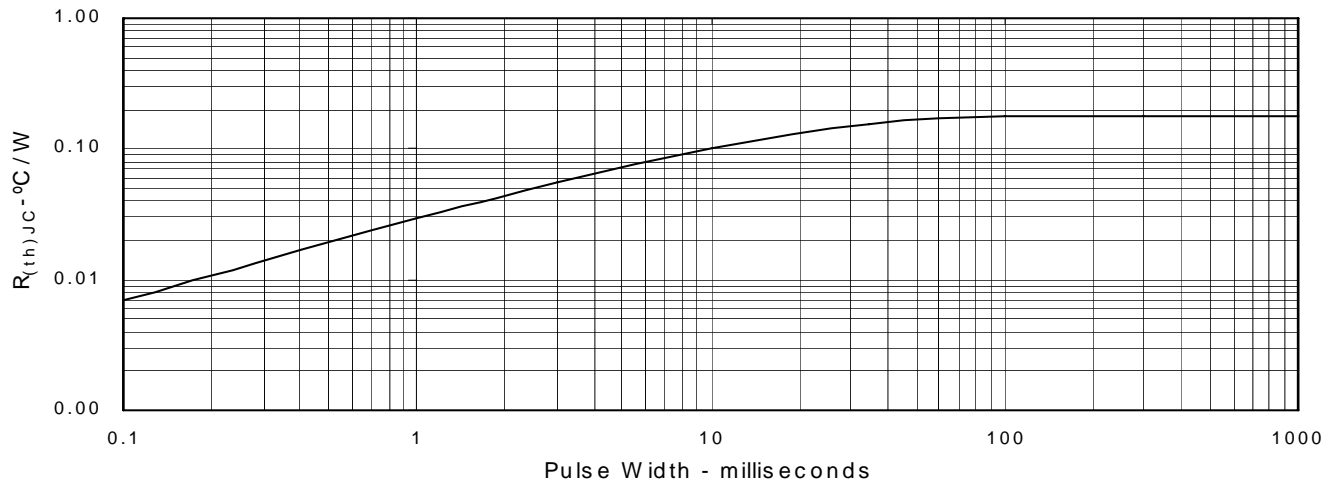


Fig. 13. Maximum Transient Thermal Resistance



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