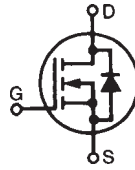


# Polar™ Power MOSFET IXFN300N10P

## HiPerFET™

N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode



$$V_{DSS} = 100V$$

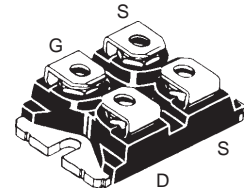
$$I_{D25} = 295A$$

$$R_{DS(on)} \leq 5.5m\Omega$$

$$t_{rr} \leq 200ns$$

Symbol	Test Conditions	Maximum Ratings	
		Value	Unit
$V_{DSS}$	$T_J = 25^\circ C$ to $175^\circ C$	100	V
$V_{DGR}$	$T_J = 25^\circ C$ to $175^\circ C$ , $R_{GS} = 1M\Omega$	100	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ C$	295	A
$I_{LRMS}$	External lead current limit	100	A
$I_{DM}$	$T_C = 25^\circ C$ , pulse width limited by $T_{JM}$	900	A
$I_A$	$T_C = 25^\circ C$	100	A
$E_{AS}$	$T_C = 25^\circ C$	3	J
$dV/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 175^\circ C$	20	V/ns
$P_D$	$T_C = 25^\circ C$	1070	W
$T_J$		-55 ... +175	$^\circ C$
$T_{JM}$		175	$^\circ C$
$T_{stg}$		-55 ... +175	$^\circ C$
$T_L$	1.6mm (0.062 in.) from case for 10s	300	$^\circ C$
$V_{ISOL}$	50/60 Hz, RMS	$t = 1min$	2500 V~
	$I_{ISOL} \leq 1mA$	$t = 1s$	3000 V~
$M_d$	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque	1.3/11.5	Nm/lb.in.
Weight		30	g

miniBLOC, SOT-227 B  
E153432



G = Gate                      D = Drain  
S = Source

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

### Features

- Fast intrinsic diode
- Avalanche Rated
- Low  $R_{DS(ON)}$  and  $Q_G$
- Low package inductance
- High current capability
- Isolation voltage 3000 V~
- International standard package

### Advantages

- Easy to mount
- Space savings
- High power density
- Low gate drive requirement

### Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC and DC motor drives
- Uninterrupted power supplies
- High speed power switching applications

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 3mA$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8mA$	3.0		5.0 V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$			25 $\mu A$
	$V_{GS} = 0V$ $T_J = 150^\circ C$			1.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 50A$ , Note 1			5.5 m $\Omega$

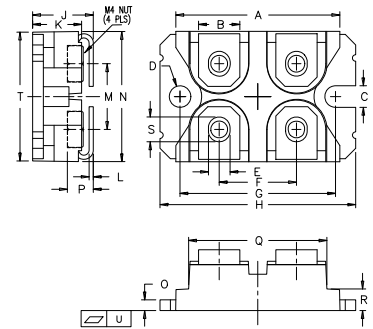
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10V, I_D = 60A$ , Note 1	55	92	S
$C_{iss}$	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		23	nF
$C_{oss}$			6100	pF
$C_{rss}$			417	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 100A$ $R_G = 1\Omega$ (External)		36	ns
$t_r$			35	ns
$t_{d(off)}$			56	ns
$t_f$			25	ns
$Q_{g(on)}$	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 150A$		279	nC
$Q_{gs}$			84	nC
$Q_{gd}$			107	nC
$R_{thJC}$			0.14	$^{\circ}C/W$
$R_{thCS}$		0.05		$^{\circ}C/W$

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0V$			300 A
$I_{SM}$	Repetitive, pulse width limited by $T_{JM}$			1000 A
$V_{SD}$	$I_F = 100A, V_{GS} = 0V$ , Note 1			1.3 V
$t_{rr}$	$I_F = 150A, -di/dt = 100A/\mu s$ $V_R = 50V$		0.71	200 ns
$Q_{RM}$			10	$\mu C$
$I_{RM}$				A

Note 1: Pulse test,  $t \leq 300\mu s$ ; duty cycle,  $d \leq 2\%$ .

### SOT-227B Outline (IXFN)



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

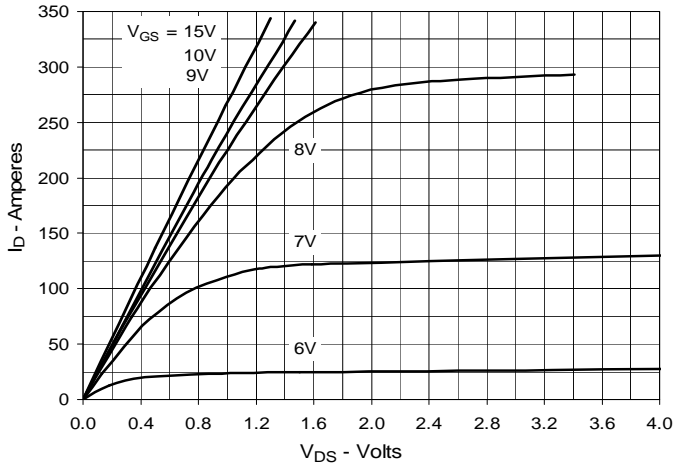
### PRELIMINARY TECHNICAL INFORMATION

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.

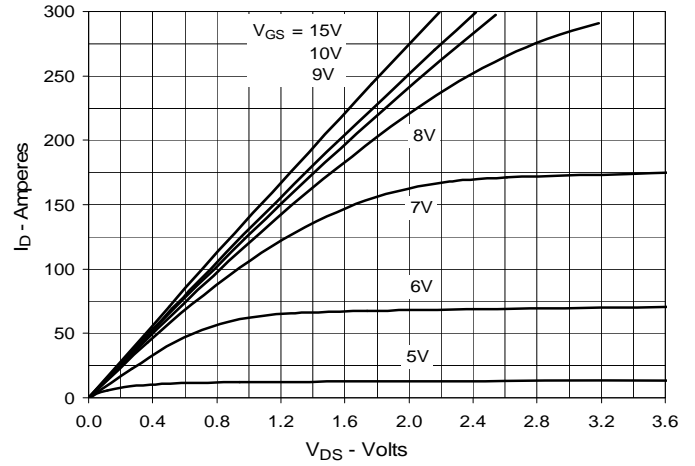
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered 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  
by 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 6,710,405 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

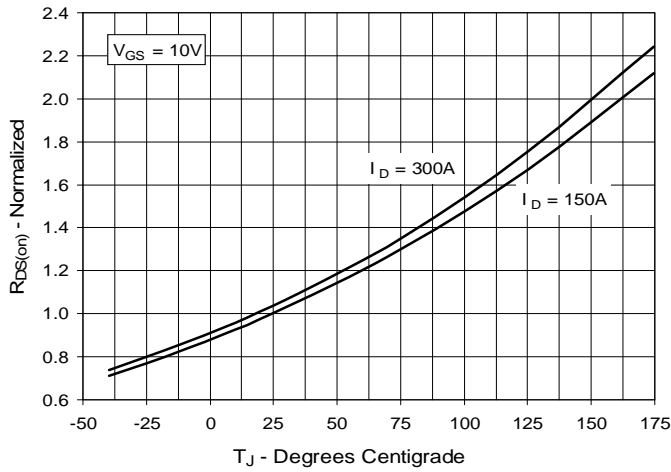
**Fig. 1. Extended Output Characteristics @ 25°C**



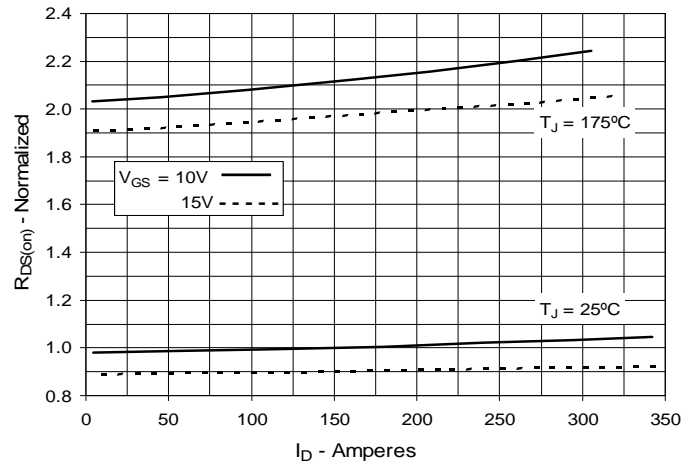
**Fig. 2. Output Characteristics @ 150°C**



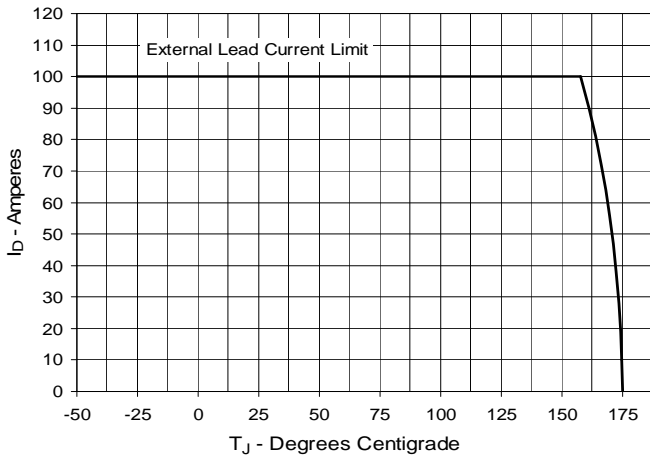
**Fig. 3.  $R_{DS(on)}$  Normalized to  $I_D = 150A$  Value vs. Junction Temperature**



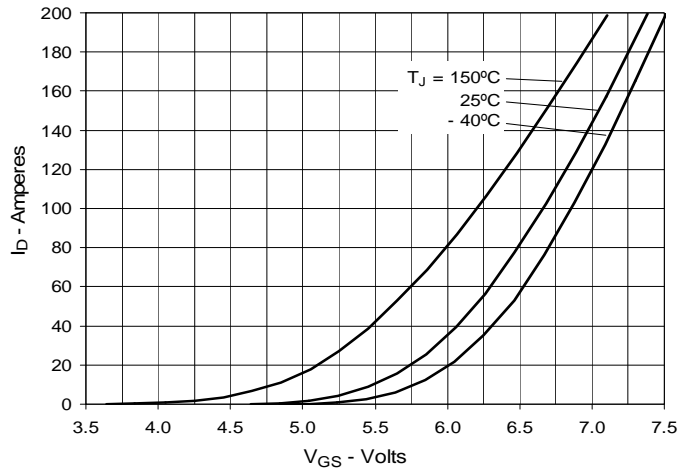
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 150A$  Value vs. Drain Current**



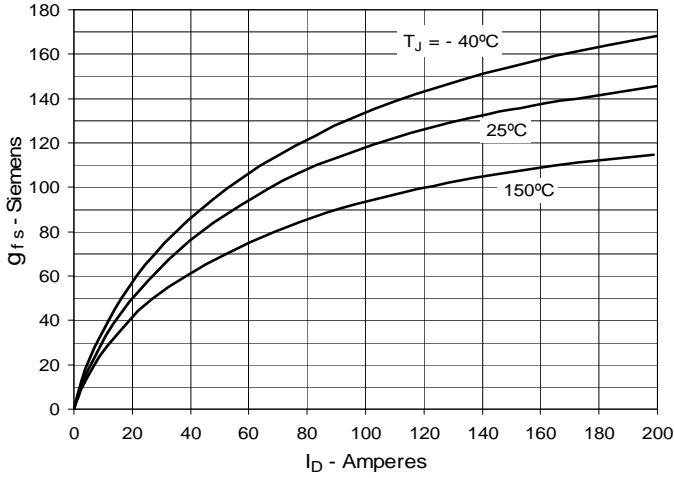
**Fig. 5. Maximum Drain Current vs. Case Temperature**



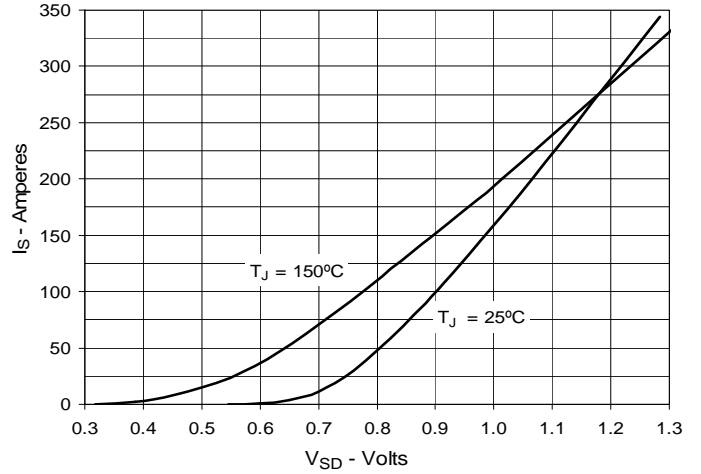
**Fig. 6. Input Admittance**



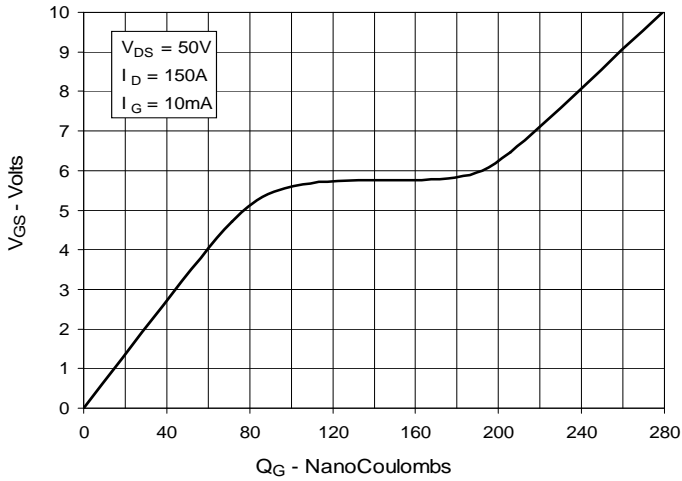
**Fig. . Transconductance**



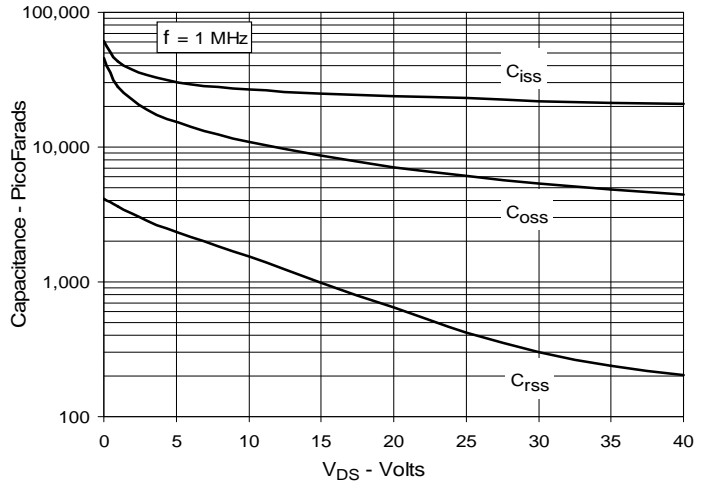
**Fig. 8. Forward Voltage Drop of Intrinsic Diode**



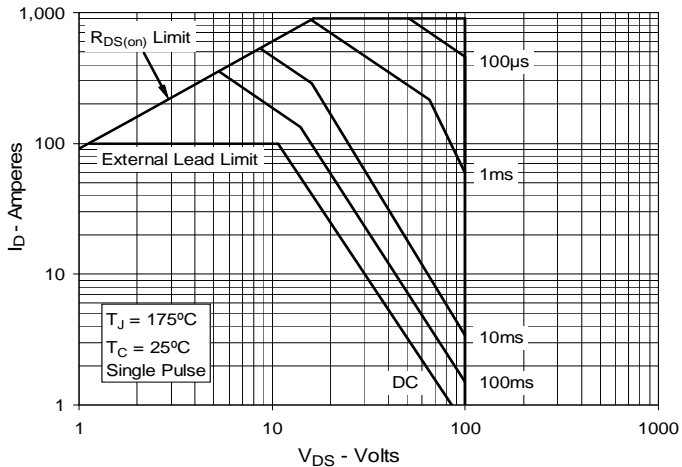
**Fig. 9. Gate Charge**



**Fig. 10. Capacitance**



**Fig. 11. Forward-Bias Safe Operating Area**



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

