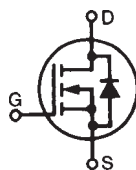


Polar™ Power MOSFET IXFN170N30P

HiPerFET™

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

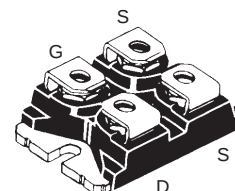


$$\begin{aligned} V_{DSS} &= 300V \\ I_{D25} &= 138A \\ R_{DS(on)} &\leq 18m\Omega \\ t_{rr} &\leq 200ns \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	300	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C , $R_{GS} = 1M\Omega$	300	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	138	A
I_{LRMS}	External lead current limit	100	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	500	A
I_A	$T_C = 25^\circ\text{C}$	85	A
E_{AS}	$T_C = 25^\circ\text{C}$	5	J
dV/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$	20	V/ns
P_D	$T_C = 25^\circ\text{C}$	890	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	1.6mm (0.062 in.) from case for 10s	300	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS	$t = 1\text{min}$	2500 V~
	$I_{ISOL} \leq 1\text{mA}$	$t = 1\text{s}$	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

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 3\text{mA}$	300		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1\text{mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$			25 μA
	$V_{GS} = 0V$, $T_J = 125^\circ\text{C}$			1.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 85A$, Note 1			18 m Ω

miniBLOC, SOT-227 B
E153432



G = Gate
S = Source
D = Drain

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

Features

- Fast intrinsic diode
- Avalanche Rated
- Unclamped Inductive Switching (UIS) rated
- Very low R_{th} results high power dissipation
- Low $R_{DS(on)}$ and Q_G
- Low package inductance

Advantages

- Low gate charge results in simple drive requirement
- Improved Gate, Avalanche and dynamic dv/dt ruggedness
- High power density

Applications

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

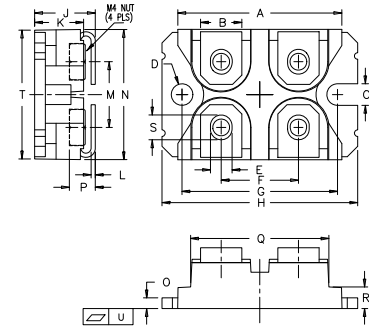
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10V, I_D = 60A$, Note 1	57	95	S
C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		20	nF
C_{oss}			2450	pF
C_{rss}			27	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 85A$ $R_G = 1\Omega$ (External)		41	ns
t_r			29	ns
$t_{d(off)}$			79	ns
t_f			16	ns
$Q_{g(on)}$	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 85A$		258	nC
Q_{gs}			82	nC
Q_{gd}			78	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	$V_{GS} = 0V$			170 A
I_{SM}	Repetitive, pulse width limited by T_{JM}			500 A
V_{SD}	$I_F = 85A, V_{GS} = 0V$, Note 1			1.3 V
t_{rr}	$I_F = 85A, -di/dt = 150A/\mu s$ $V_R = 100V$	1.85	21	200 ns
Q_{RM}				μC
I_{RM}				A

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

SOT-227B Outline



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.

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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. Output Characteristics
@ 25°C

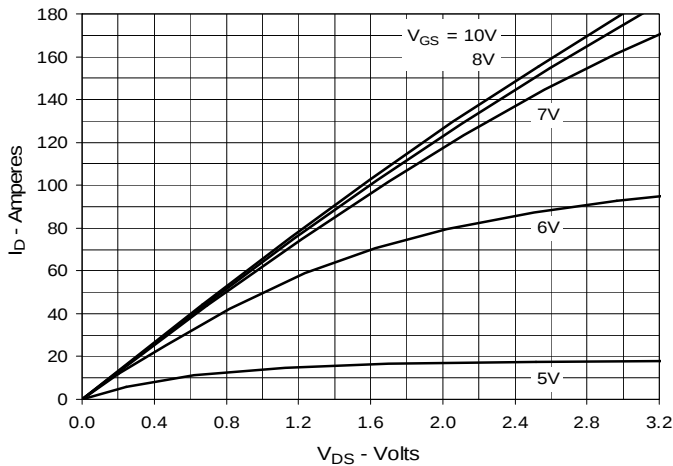


Fig. 2. Extended Output Characteristics
@ 25°C

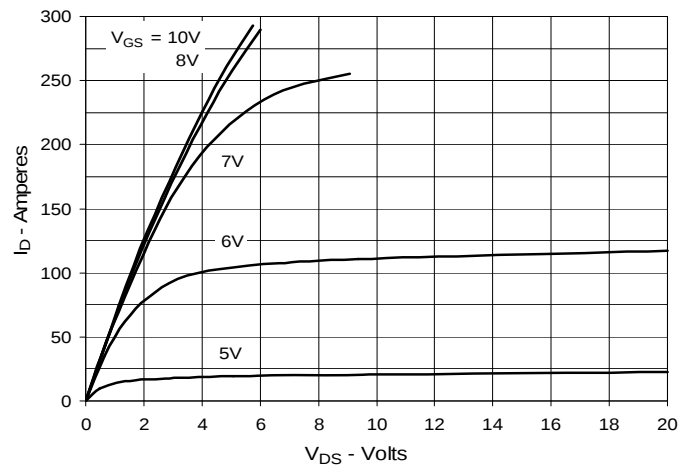


Fig. 3. Output Characteristics
@ 125°C

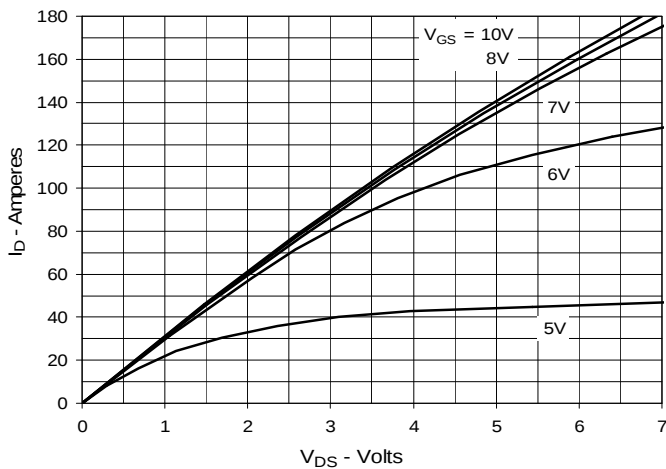


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 85A$ Value
vs. Junction Temperature

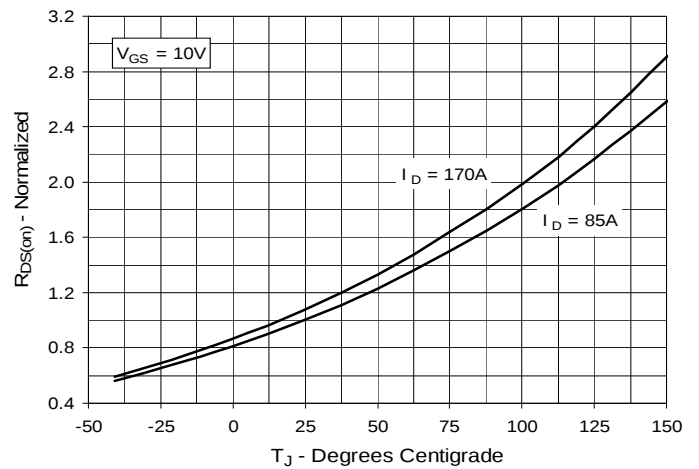


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 85A$ Value
vs. Drain Current

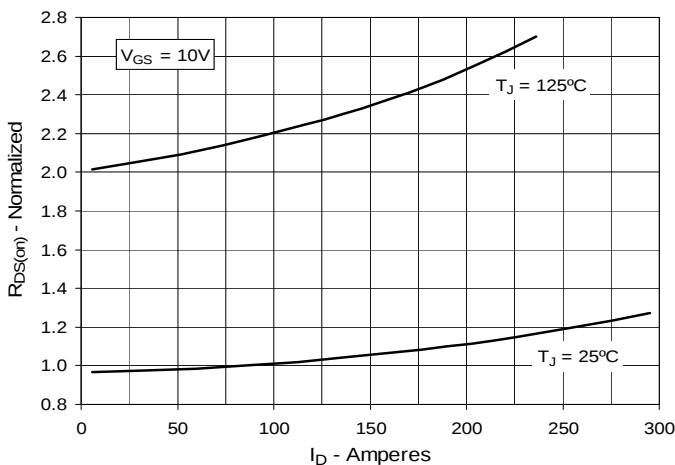


Fig. 6. Maximum Drain Current vs.
Case Temperature

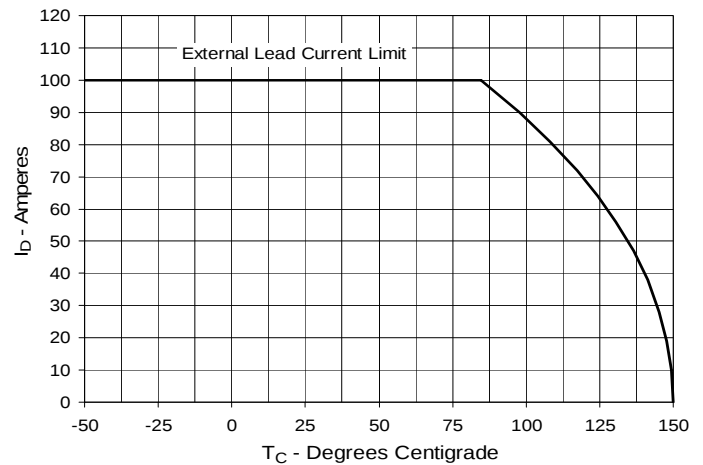


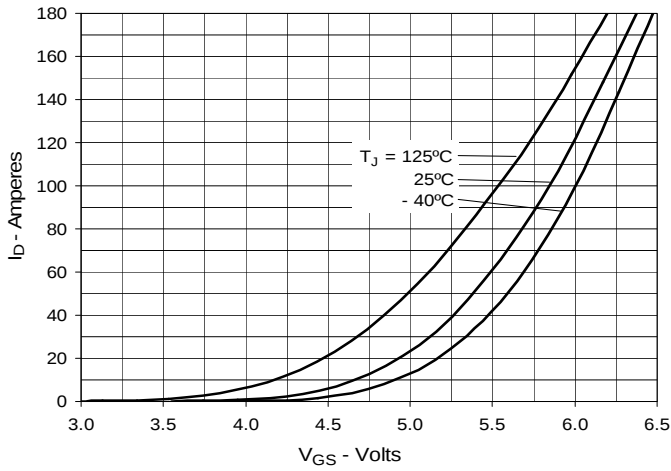
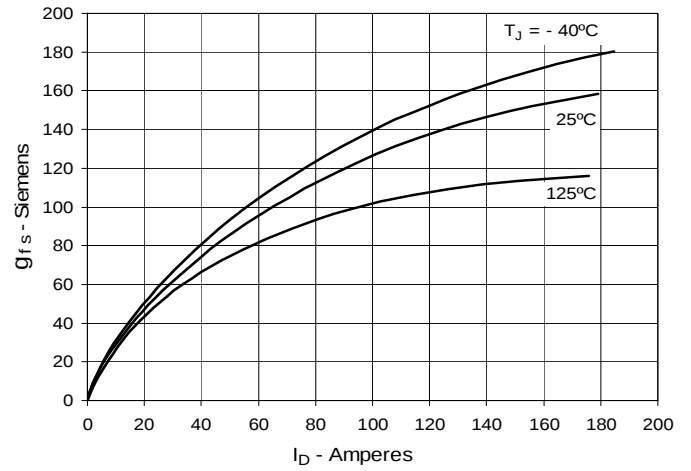
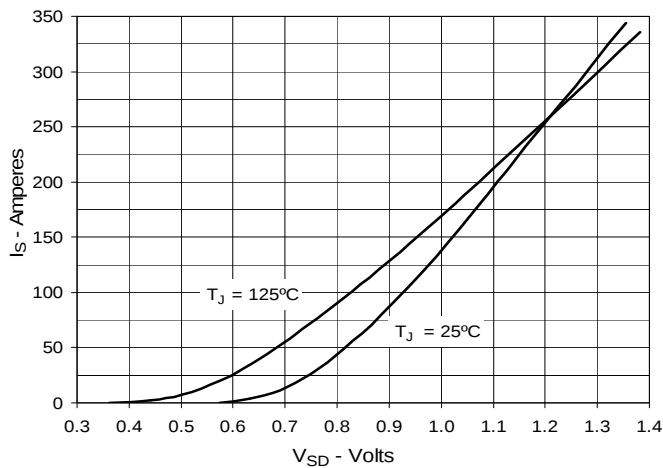
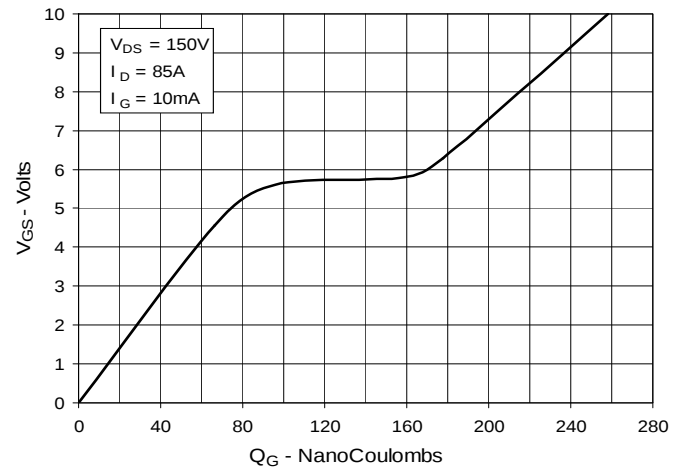
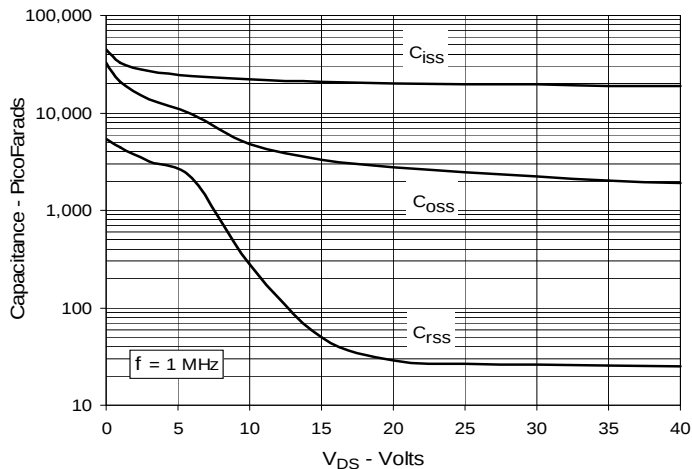
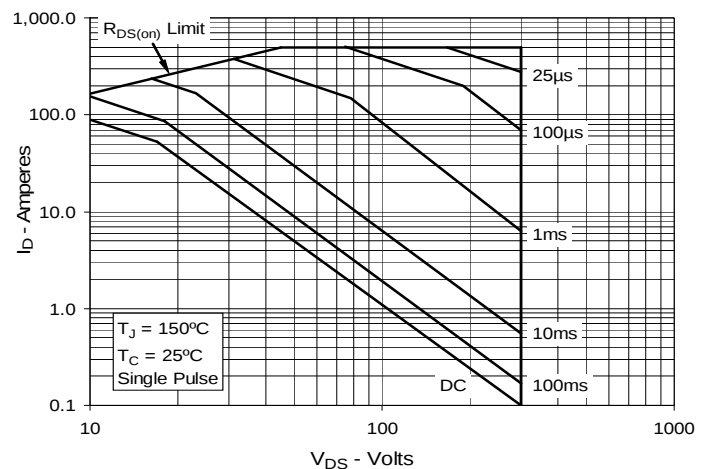
Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Forward-Bias Safe Operating Area


Fig. 12. Maximum Transient Thermal Impedance

