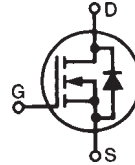


# PolarHV™ HiPerFET IXFN 60N80P

## Power MOSFET

N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode



$$V_{DSS} = 800 \text{ V}$$

$$I_{D25} = 53 \text{ A}$$

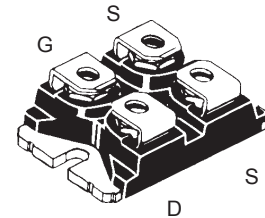
$$R_{DS(on)} \leq 140 \text{ m}\Omega$$

$$t_{rr} \leq 250 \text{ ns}$$

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	800	V
$V_{DGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	800	V
$V_{GSS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	53	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	250	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	30	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	100	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	5	J
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$	20	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	1040	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6 mm (0.062 in.) from case for 10 s	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	1.5 / 13	Nm/lb.in.
<b>Weight</b>		30	g

miniBLOC, SOT-227 B (IXFN)

E153432



G = Gate      D = Drain  
S = Source

Either Source terminal S can be used as the Source terminal or the Kelvin Source (gate return) terminal.

### Features

- International standard package
- Encapsulating epoxy meets UL 94 V-0, flammability classification
- miniBLOC with Aluminium nitride isolation
- † Fast recovery diode
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance
  - easy to drive and to protect

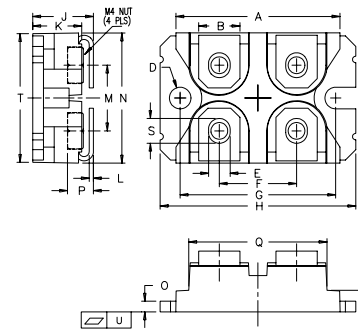
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 3 \text{ mA}$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$	3.0		5.0 V
$I_{GSS}$	$V_{GS} = \pm 30 \text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 200 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			25 $\mu\text{A}$
				3000 $\mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = I_T$ , Note 1			140 $\text{m}\Omega$

### Advantages

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

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25° C, unless otherwise specified)		
		Min.	Typ.	Max.
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 20 V; I <sub>D</sub> = I <sub>T</sub> , Note 1	35	67	S
<b>C<sub>iss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		18	nF
<b>C<sub>oss</sub></b>			1200	pF
<b>C<sub>rss</sub></b>			44	pF
<b>t<sub>d(on)</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub> R <sub>G</sub> = 1 Ω (External)		36	ns
<b>t<sub>r</sub></b>			29	ns
<b>t<sub>d(off)</sub></b>			110	ns
<b>t<sub>f</sub></b>			26	ns
<b>Q<sub>g(on)</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub>		250	nC
<b>Q<sub>gs</sub></b>			90	nC
<b>Q<sub>gd</sub></b>			78	nC
<b>R<sub>thJC</sub></b>			0.12	°C/W
<b>R<sub>thCS</sub></b>			0.05	°C/W

### 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

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25° C, unless otherwise specified)		
		Min.	Typ.	Max.
<b>I<sub>S</sub></b>	V <sub>GS</sub> = 0 V			60 A
<b>I<sub>SM</sub></b>	Repetitive			150 A
<b>V<sub>SD</sub></b>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0 V, Note 1			1.5 V
<b>t<sub>tr</sub></b>	I <sub>F</sub> = 25A, -di/dt = 100 A/μs V <sub>R</sub> = 100V			250 ns
<b>Q<sub>RM</sub></b>			0.6	μC
<b>I<sub>RM</sub></b>			6.0	A

### Notes:

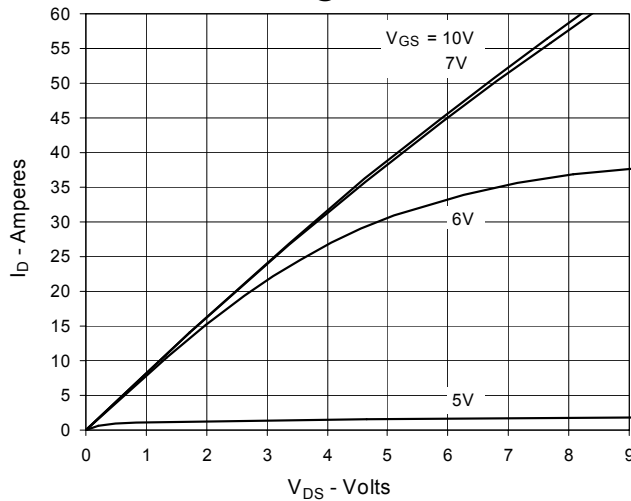
1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %

Test current I<sub>T</sub> = 30 A

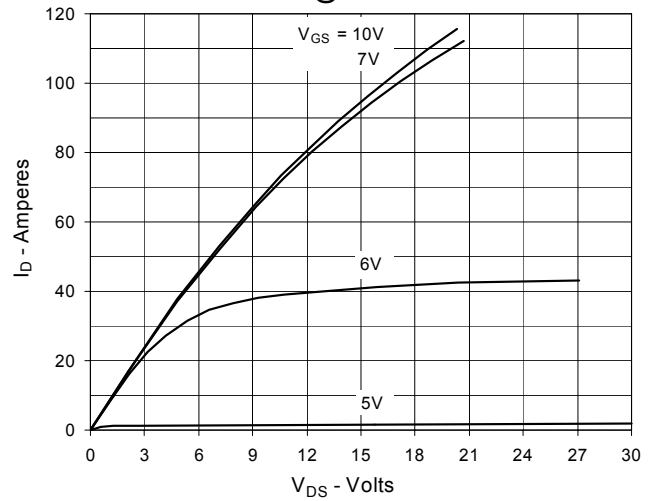
IXYS reserves the right to change limits, test conditions, and dimensions.

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 6,710,405 B2 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

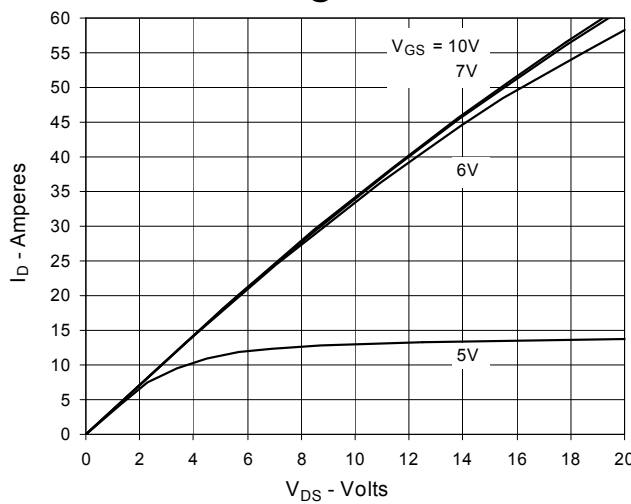
**Fig. 1. Output Characteristics @ 25°C**



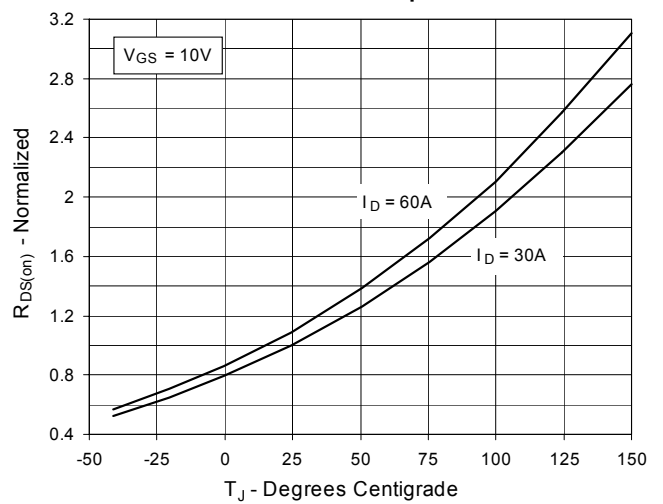
**Fig. 2. Extended Output Characteristics @ 25°C**



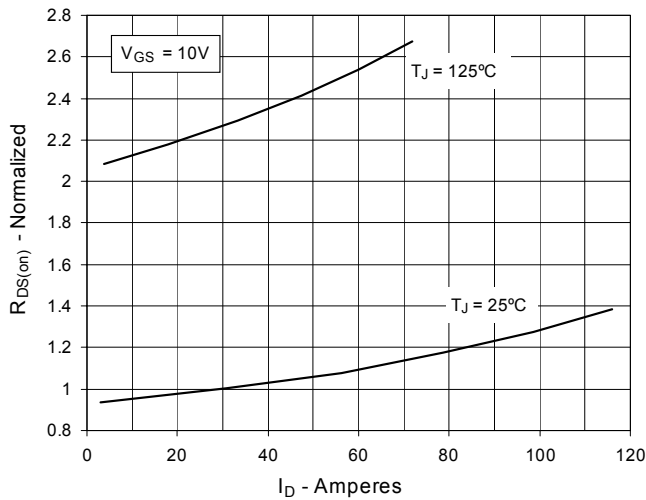
**Fig. 3. Output Characteristics @ 125°C**



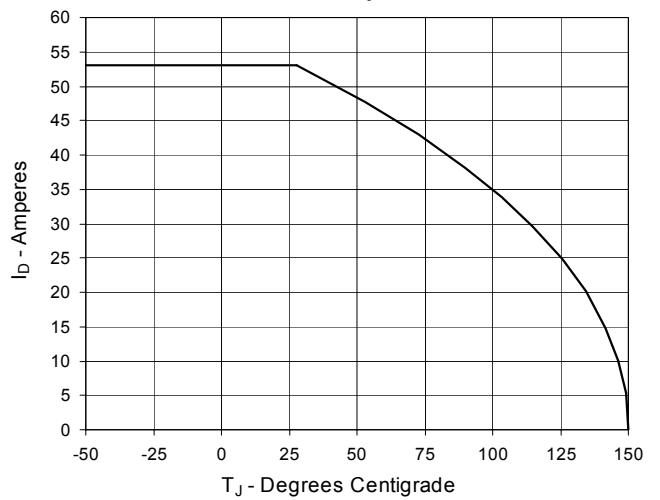
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 30A$  Value vs. Junction Temperature**



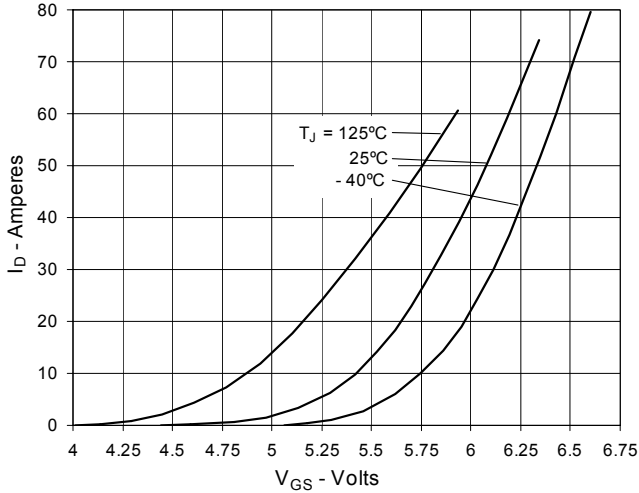
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 30A$  Value vs. Drain Current**



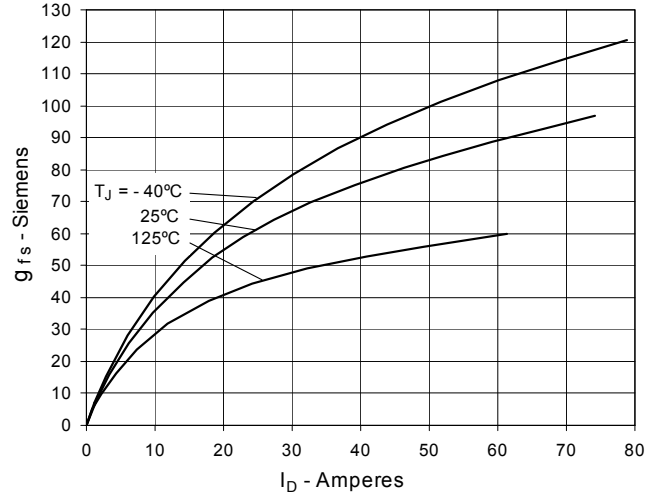
**Fig. 6. Maximum Drain Current vs. Case Temperature**



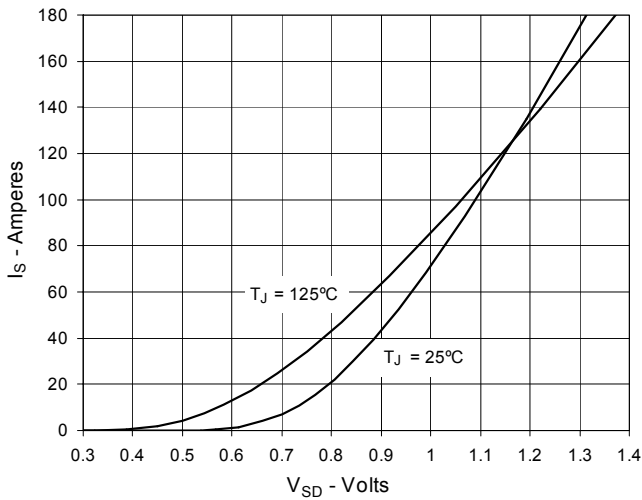
**Fig. 7. Input Admittance**



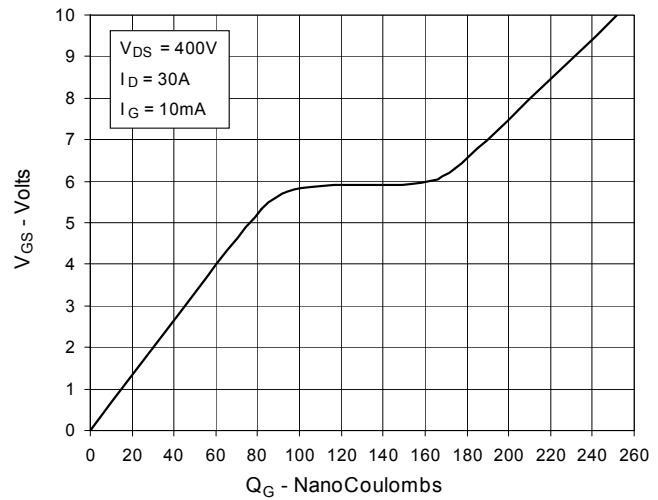
**Fig. 8. Transconductance**



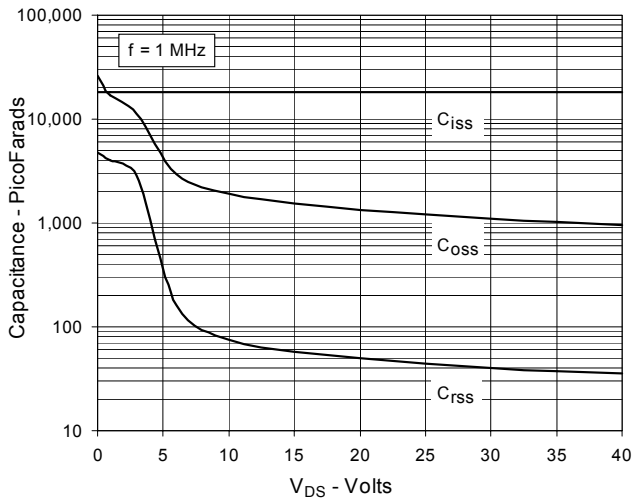
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Maximum Transient Thermal Resistance**

