

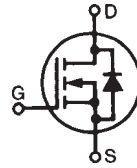
# HiPerFET™

## Power MOSFETs

### Single Die MOSFET

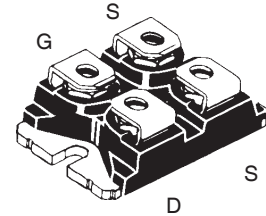
N-Channel Enhancement Mode  
Avalanche Rated  
High dV/dt, Low  $t_{rr}$

# IXFN280N07



$$\begin{aligned} V_{DSS} &= 70V \\ I_{D25} &= 280A \\ R_{DS(on)} &\leq 5m\Omega \\ t_{rr} &\leq 250ns \end{aligned}$$

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.

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	70	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1M\Omega$	70	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	280	A
$I_{L(RMS)}$	Terminal current limit	100	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	1120	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	180	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	60	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	3	J
$dV/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$	20	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	600	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	$^\circ\text{C}$
$V_{ISOL}$	50/60Hz, 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.
<b>Weight</b>		30	g

### Features

- International standard package
- miniBLOC with Aluminium nitride isolation
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped inductive switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

### Advantages

- Easy to mount
- Space savings
- High power density

### Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

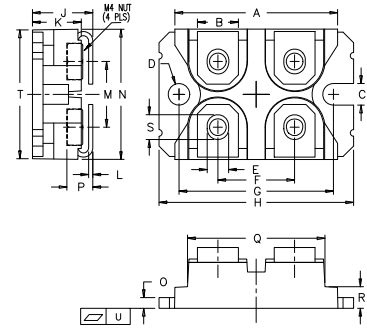
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 3\text{mA}$	70		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8\text{mA}$	2.0		V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			100 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 120A$ , Note 1			5 m $\Omega$

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 15\text{V}, I_D = 60\text{A}$ , Note 1	47	78	S
$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		11.5	nF
$C_{oss}$			4800	pF
$C_{rss}$			2650	pF
$R_{Gi}$	Gate input resistance		0.74	$\Omega$
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 90\text{A}$ $R_G = 1\Omega$ (External)		40	ns
$t_r$			90	ns
$t_{d(off)}$			85	ns
$t_f$			50	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 35\text{V}, I_D = 100\text{A}$		360	nC
$Q_{gs}$			60	nC
$Q_{gd}$			182	nC
$R_{thJC}$			0.22	$^\circ\text{C/W}$
$R_{thCS}$		0.05		$^\circ\text{C/W}$

**Source-Drain Diode**

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_s$	$V_{GS} = 0\text{V}$			280 A
$I_{SM}$	Repetitive, pulse width limited by $T_{JM}$			1120 A
$V_{SD}$	$I_F = 100\text{A}, V_{GS} = 0\text{V}$ , Note 1			1.3 V
$t_{rr}$	$I_F = 50\text{A}, -di/dt = 100\text{A}/\mu\text{s}, V_R = 50\text{V}$			250 ns
$Q_{RM}$			1.2	$\mu\text{C}$
$I_{RM}$			10	A

Note 1: Pulse test,  $t \leq 300\mu\text{s}$ ; 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

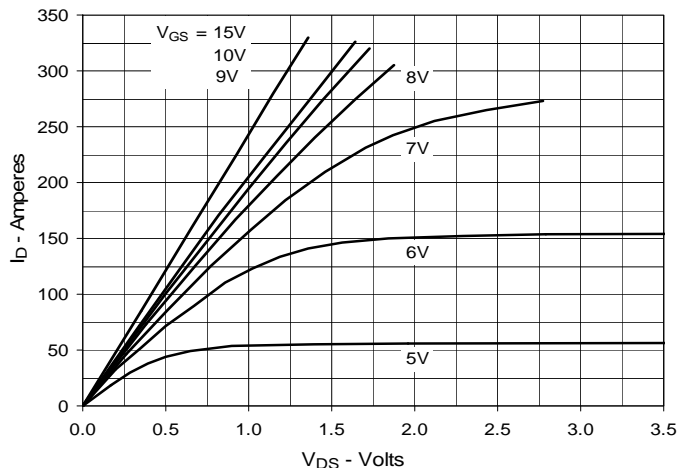
**PRELIMINARY TECHNICAL INFORMATION**

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.

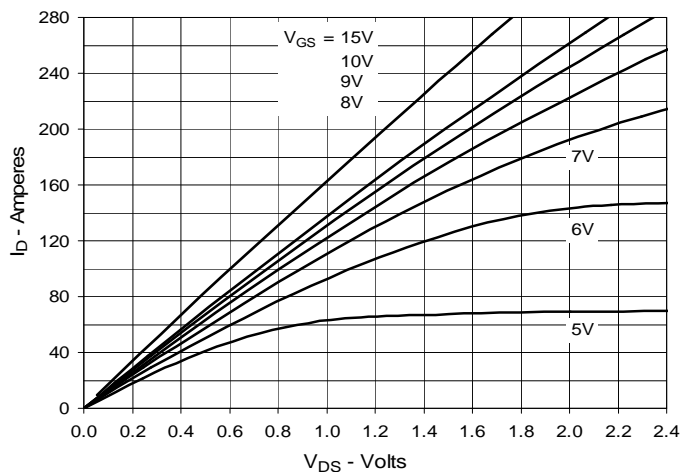
IXYS reserves the right to change limits, test conditions, and dimensions.

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	7,157,338B2
	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	

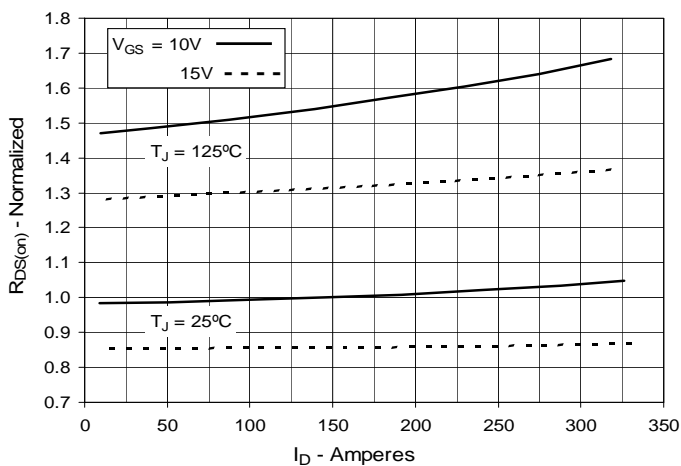
**Fig. 1. Extended Output Characteristics @ 25°C**



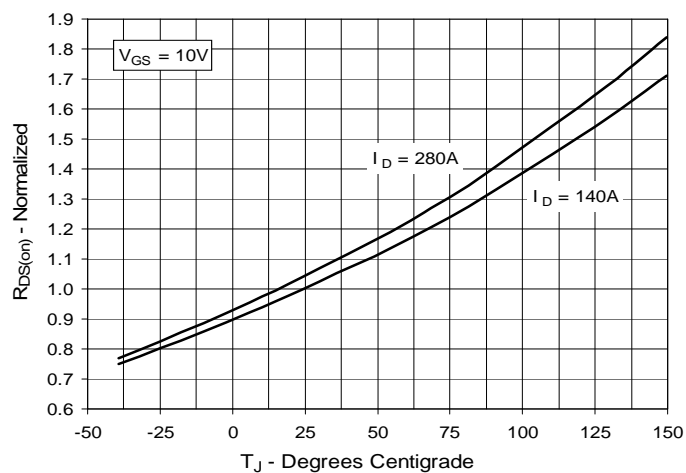
**Fig. 2. Output Characteristics @ 125°C**



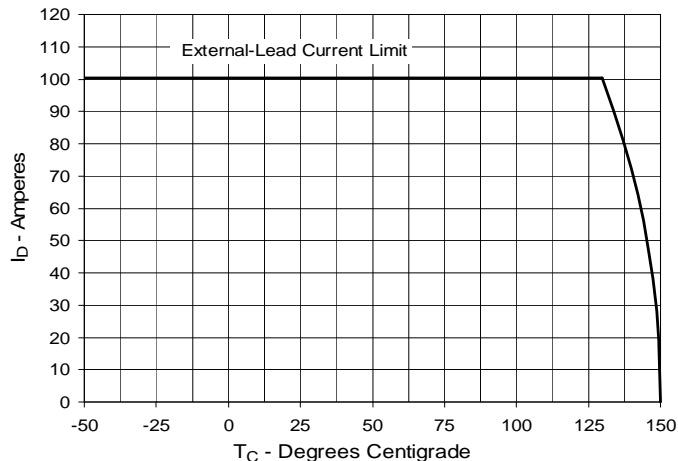
**Fig. 3.  $R_{DS(on)}$  Normalized to  $I_D = 140A$  Value vs. Drain Current**



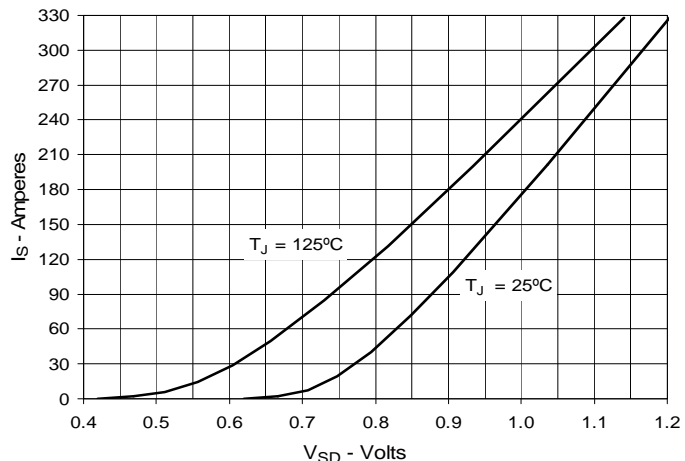
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 140A$  Value vs. Junction Temperature**



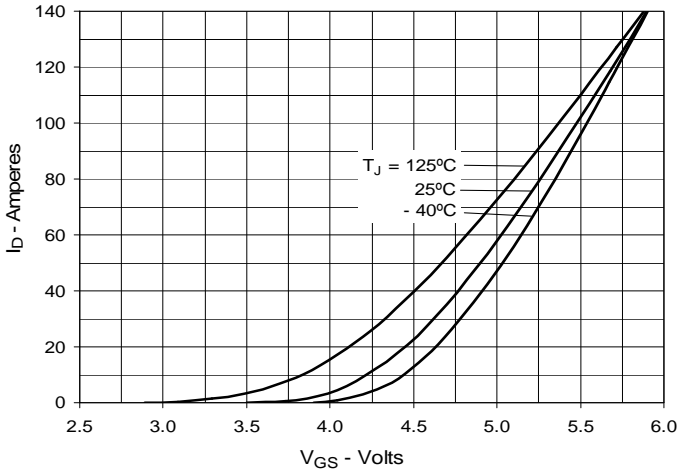
**Fig. 5. Maximum Drain Current vs. Case Temperature**



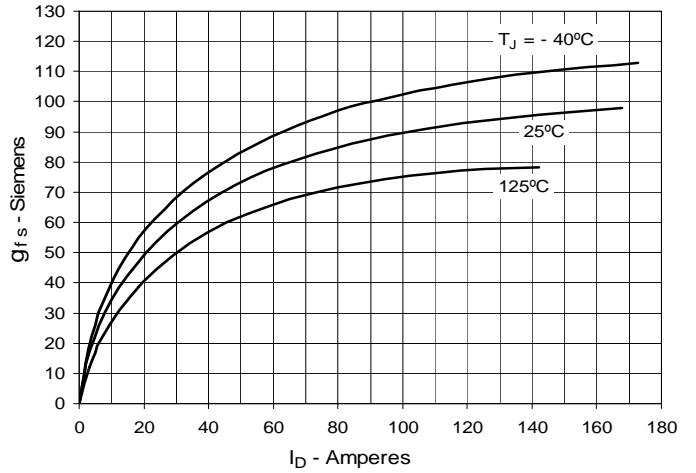
**Fig. 6. Forward Voltage Drop of Intrinsic Diode**



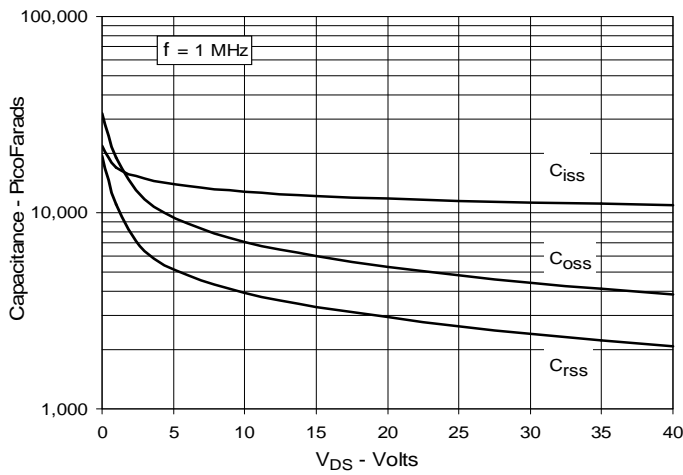
**Fig. 7. Input Admittance**



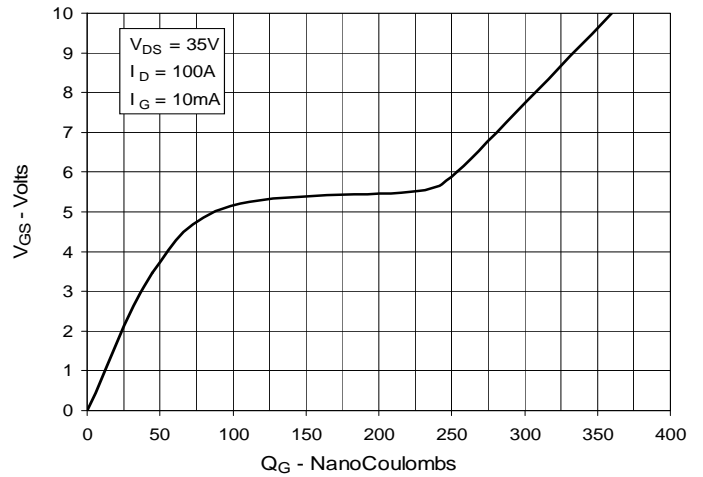
**Fig. 8. Transconductance**



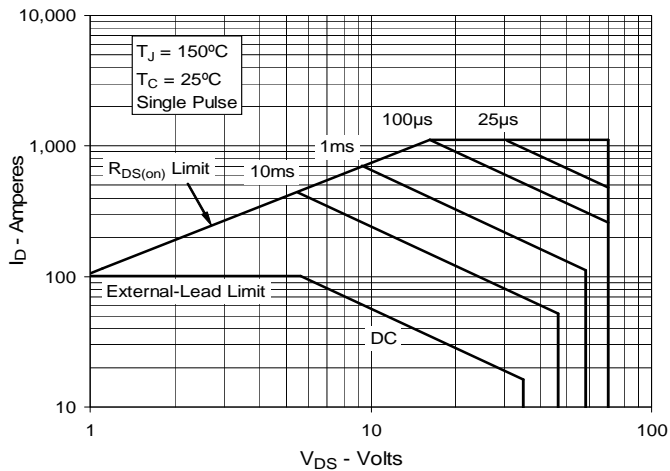
**Fig. 9. Capacitance**



**Fig. 10. Gate Charge**



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



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

