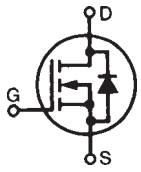
IXYS

HiPerFET™ Power MOSFETs Single Die MOSFET

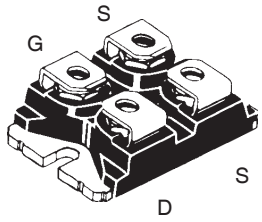
IXFN280N07

V_{DSS} = 70V
I_{D25} = 280A
$R_{DS(on)}$ ≤ 5mΩ
t_{rr} ≤ 250ns

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



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°C to 150°C		70	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		70	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C		280	A
$I_{L(RMS)}$	Terminal current limit		100	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}		1120	A
I_{AR}	T_C = 25°C		180	A
E_{AR}	T_C = 25°C		60	mJ
E_{AS}	T_C = 25°C		3	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$		20	V/ns
P_D	T_C = 25°C		600	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	1.6mm (0.062 in.) from case for 10s		300	°C
V_{ISOL}	50/60Hz, RMS	t = 1min	2500	V~
	$I_{ISOL} \le$ 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

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA		70			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA		2.0		4.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V				±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$				100	μA
	V_{GS} = 0V	T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 120A, Note 1				5	mΩ

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

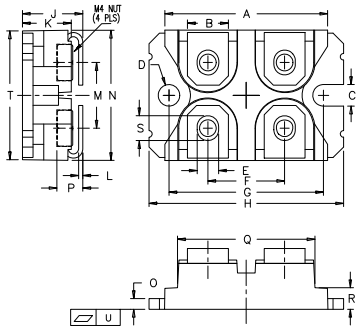
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 15V, I_D = 60A , Note 1	47	78		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		11.5		nF
C_{oss}			4800		pF
C_{rss}			2650		pF
R_{Gi}	Gate input resistance		0.74		Ω
$t_{d(on)}$	**Resistive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

Source-Drain Diode

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

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

SOT-227B Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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.

Fig. 1. Extended Output Characteristics @ 25ºC

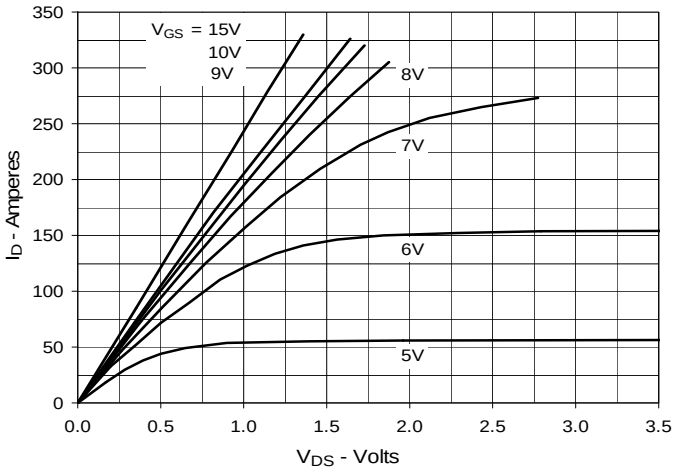


Fig. 2. Output Characteristics @ 125ºC

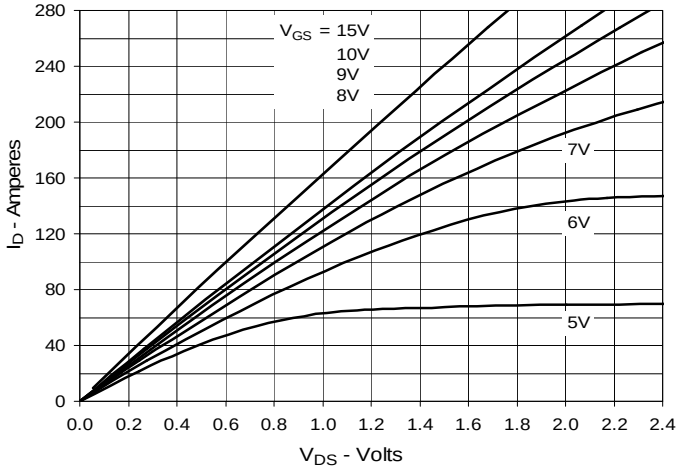


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 140A Value vs.Drain Current

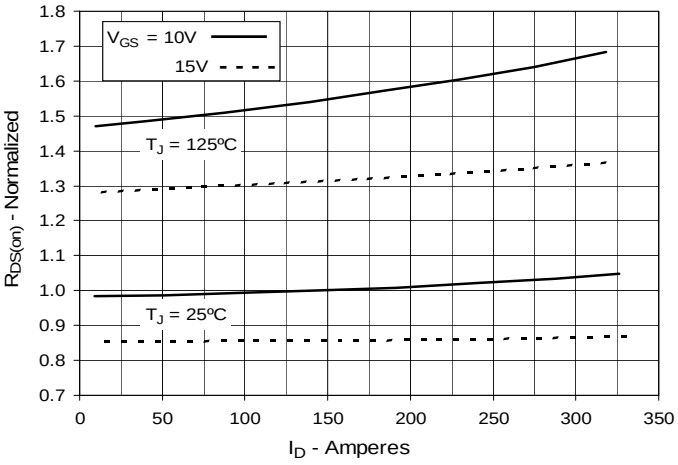


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 140A Value vs. Junction Temperature

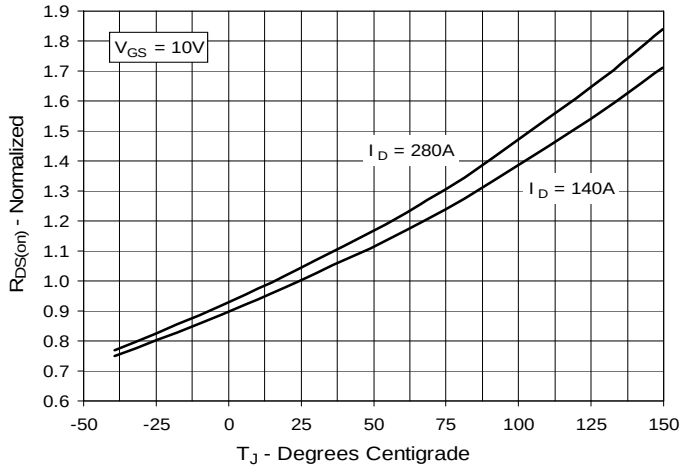


Fig. 5. Maximum Drain Current vs. Case Temperature

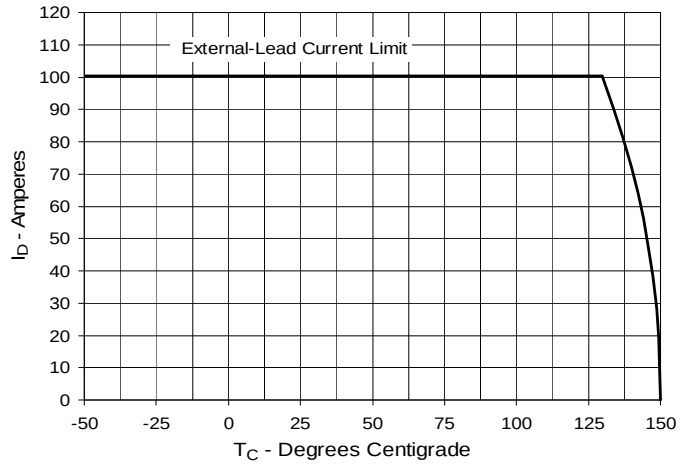


Fig. 6. Forward Voltage Drop of Intrinsic Diode

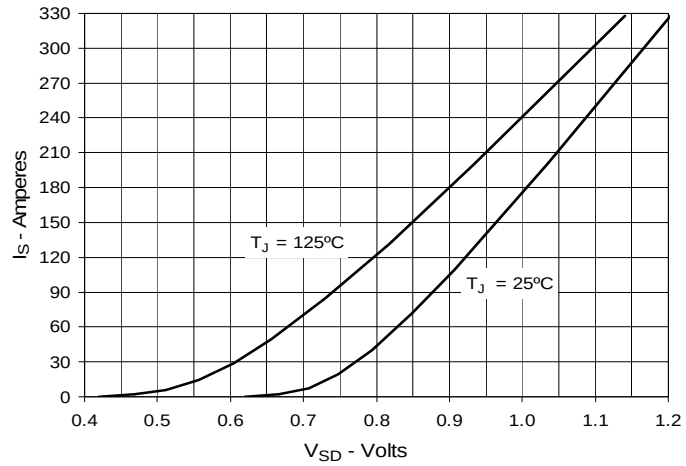


Fig. 7. Input Admittance

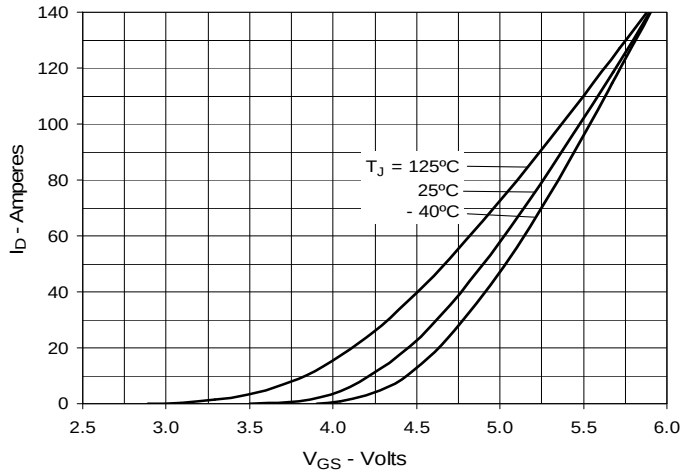


Fig. 8. Transconductance

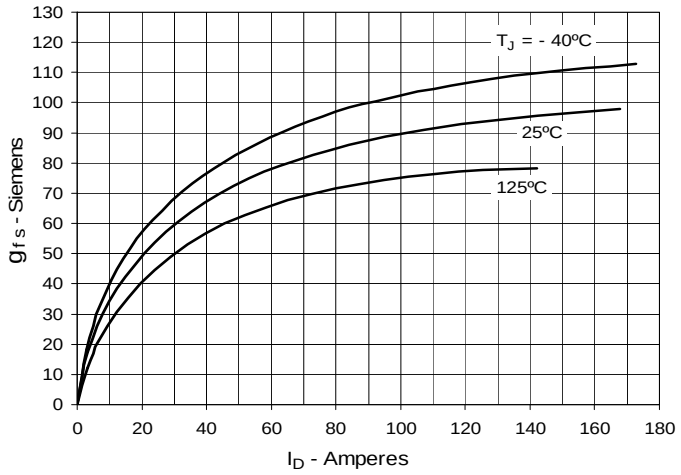


Fig. 9. Capacitance

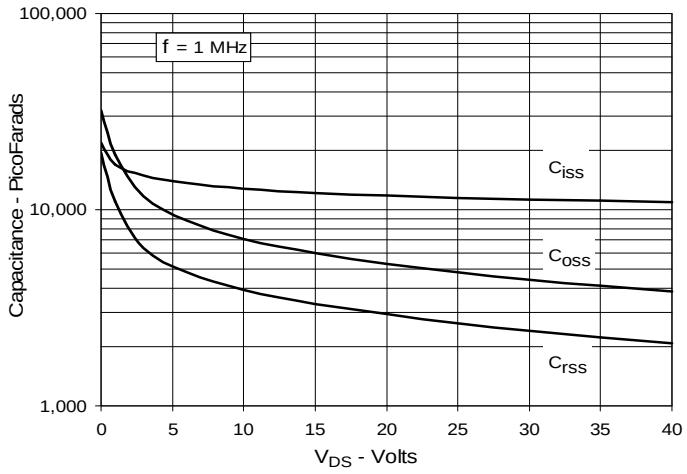


Fig. 10. Gate Charge

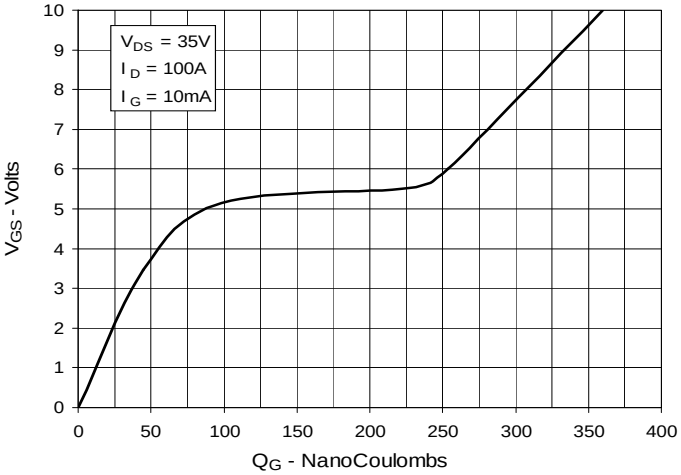


Fig. 11. Forward-Bias Safe Operating Area

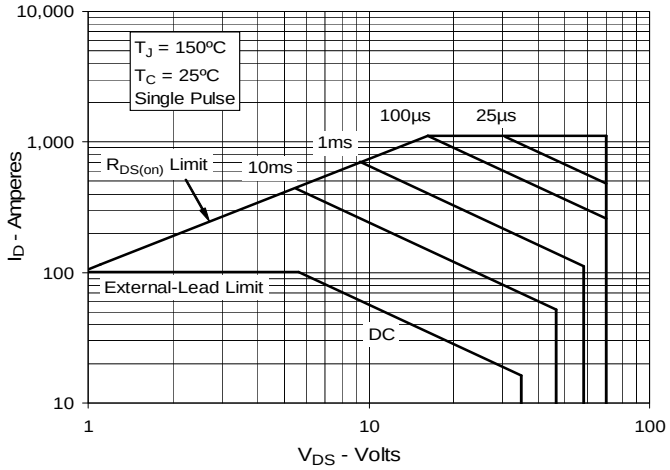


Fig. 12. Maximum Transient Thermal Impedance