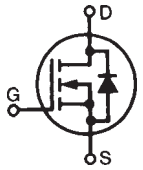
IXYS

Polar™ HiPerFET™ Power MOSFET

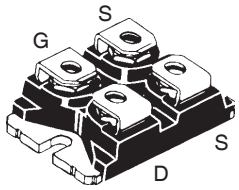
IXFN210N20P

V_{DSS} = 200V
I_{D25} = 188A
$R_{DS(on)}$ ≤ 10.5mΩ
t_{rr} ≤ 200ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



miniBLOC
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 175°C		200	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ		200	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		± 30	V
I_{D25}	T_C = 25°C		188	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		600	A
I_A	T_C = 25°C		105	A
E_{AS}	T_C = 25°C		4	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 175°C$		20	V/ns
P_D	T_C = 25°C		1070	W
T_J			-55 ... +175	°C
T_{JM}			175	°C
T_{stg}			-55 ... +175	°C
T_L	1.6mm (0.062 in.) from Case for 10s		300	°C
V_{ISOL}	50/60 Hz, 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	200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA	2.5		4.5	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			25	μA
	T_J = 150°C			2	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 105A, Note 1			10.5	mΩ

Features

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- Low Package Inductance Avalanche Rated
- Low $R_{DS(ON)}$ and Q_G
- Fast Intrinsic Diode

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- DC-DC Coverters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC and DC Motor Drives
- Uninterrupted Power Supplies
- High Speed Power Switching Applications

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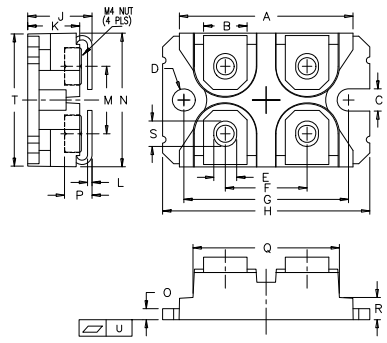
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	60	103		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		18.6		nF
C_{oss}			3270		pF
C_{rss}			80		pF
$t_{d(on)}$	**Resistive Switching Times**		43		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 105A		30		ns
$t_{d(off)}$	R_G = 1Ω (External)		70		ns
t_f			18		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 105A		255		nC
Q_{gs}			94		nC
Q_{gd}			83		nC
R_{thJC}				0.14	°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			210	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			800	A
V_{SD}	I_F = 105A, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 105A, -di/dt = 150A/μs			200	ns
Q_{RM}	V_R = 100V		1.34		μC
I_{RM}			18		A

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

SOT-227B (IXFN) Outline



(M4 screws (4x) supplied)

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

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 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

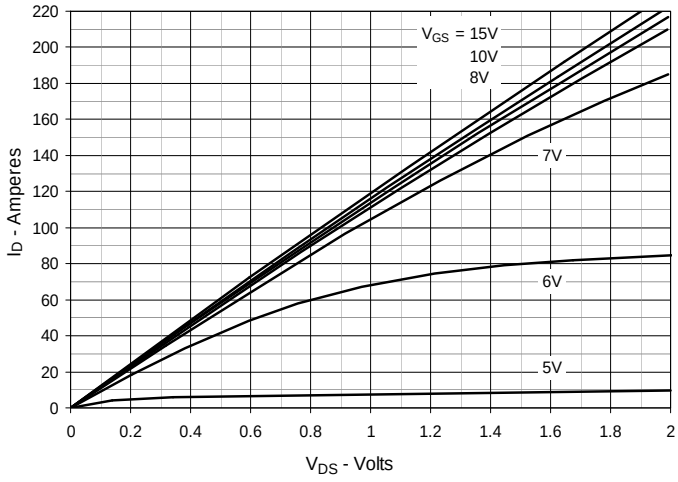


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

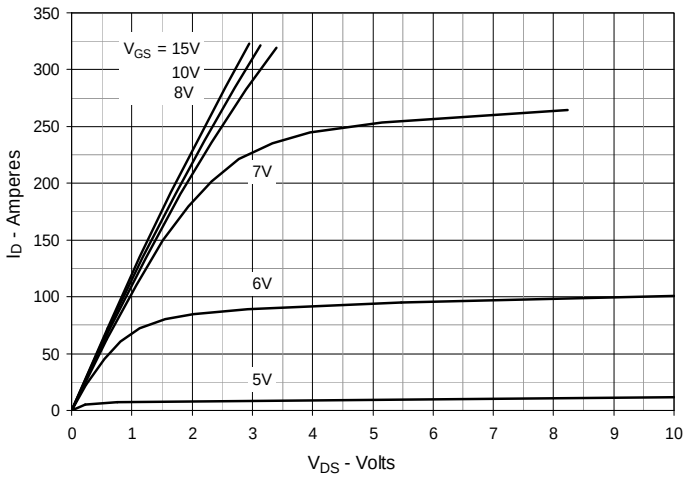


Fig. 3. Output Characteristics @ T_J = 150ºC

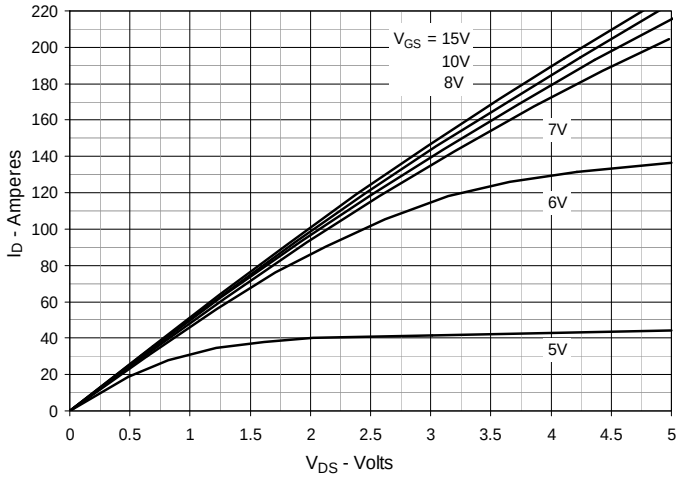


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 105A Value vs. Junction Temperature

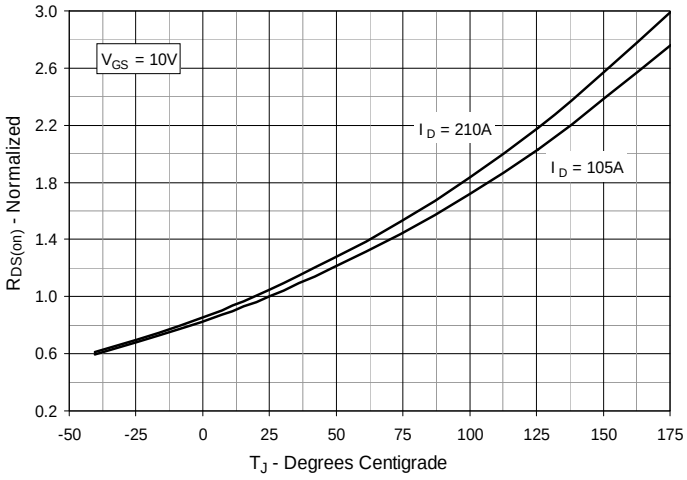


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 105A Value vs. Drain Current

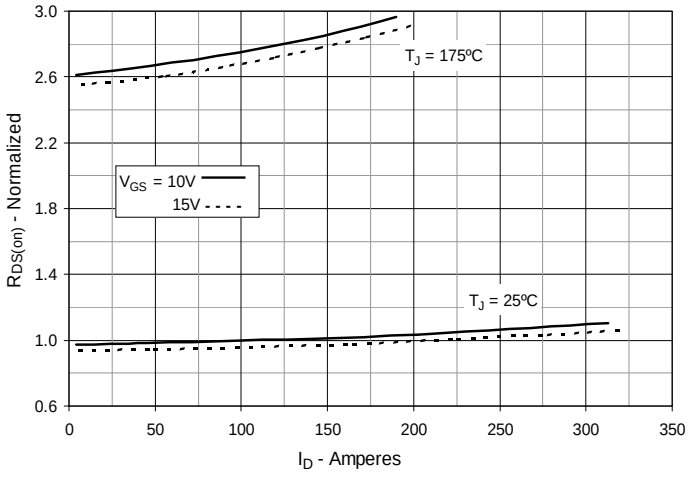
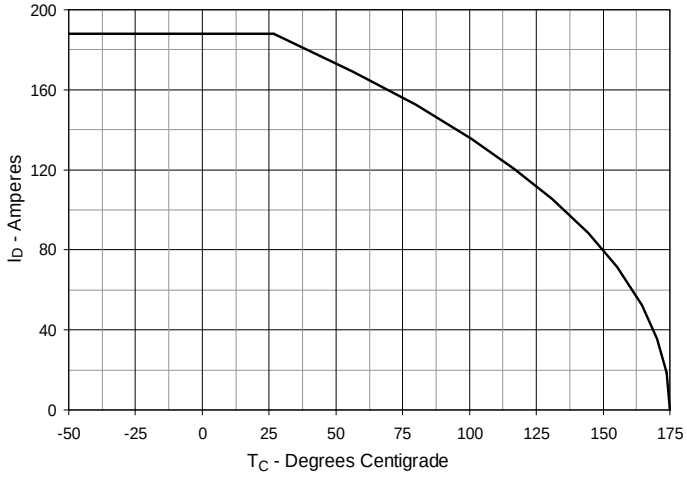


Fig. 6. Maximum Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

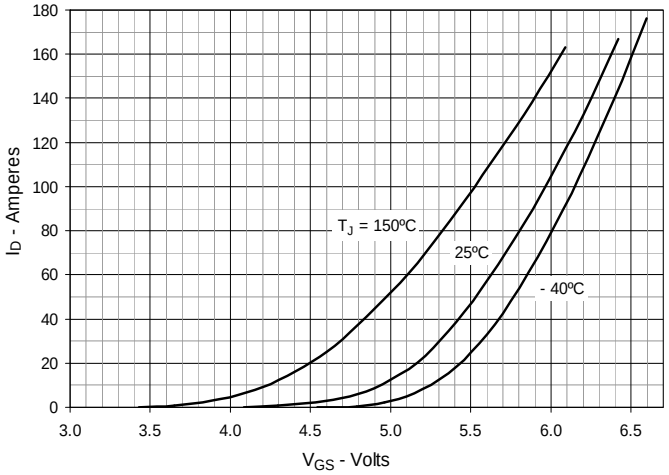


Fig. 8. Transconductance

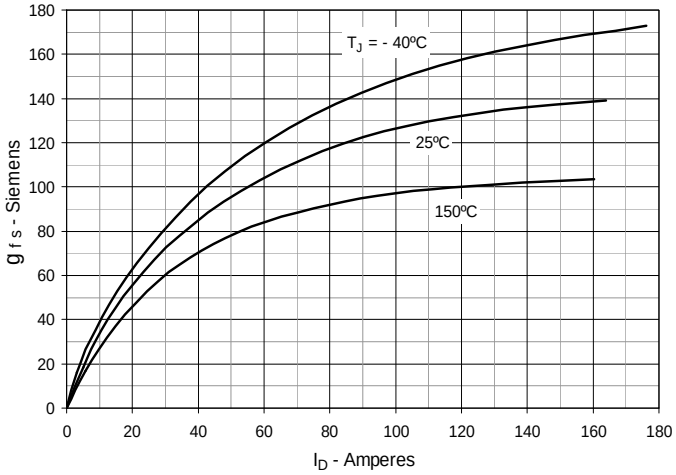


Fig. 9. Forward Voltage Drop of Intrinsic Diode

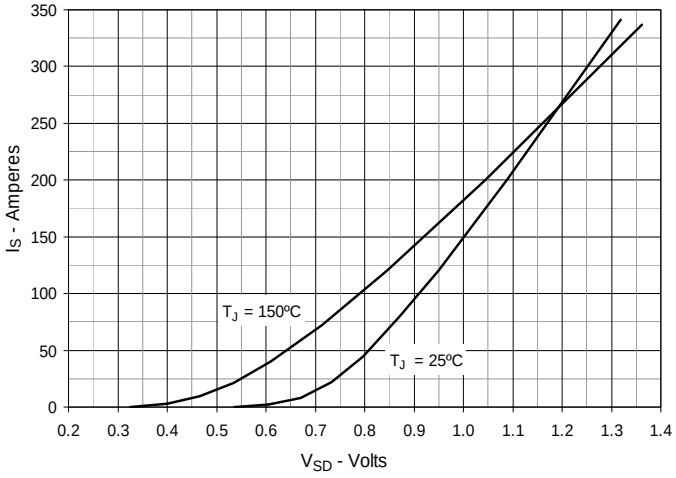


Fig. 10. Gate Charge

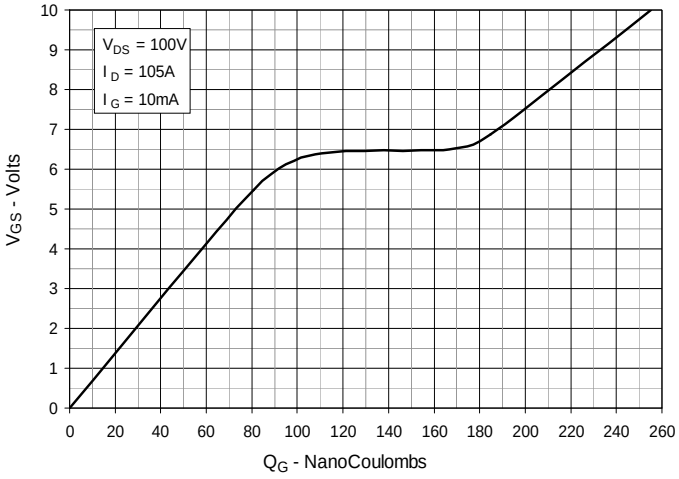


Fig. 11. Capacitance

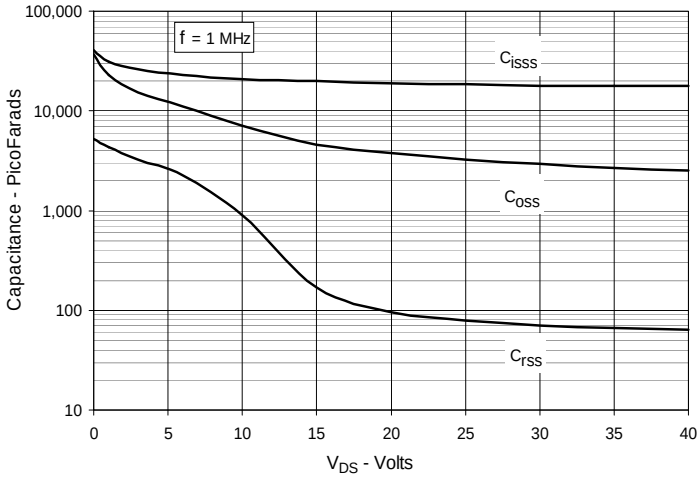
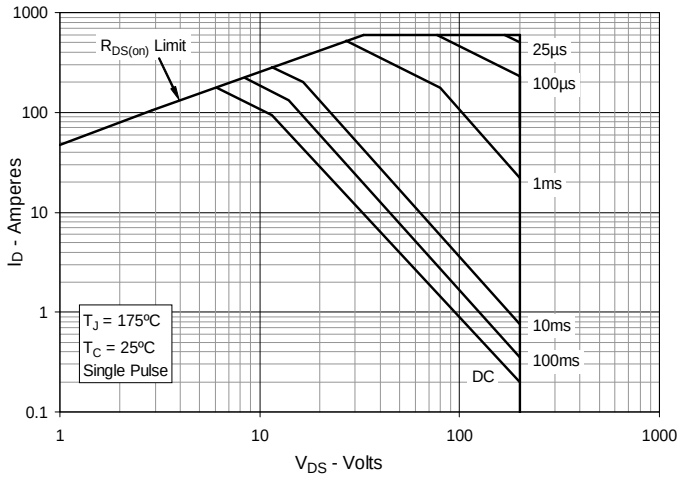
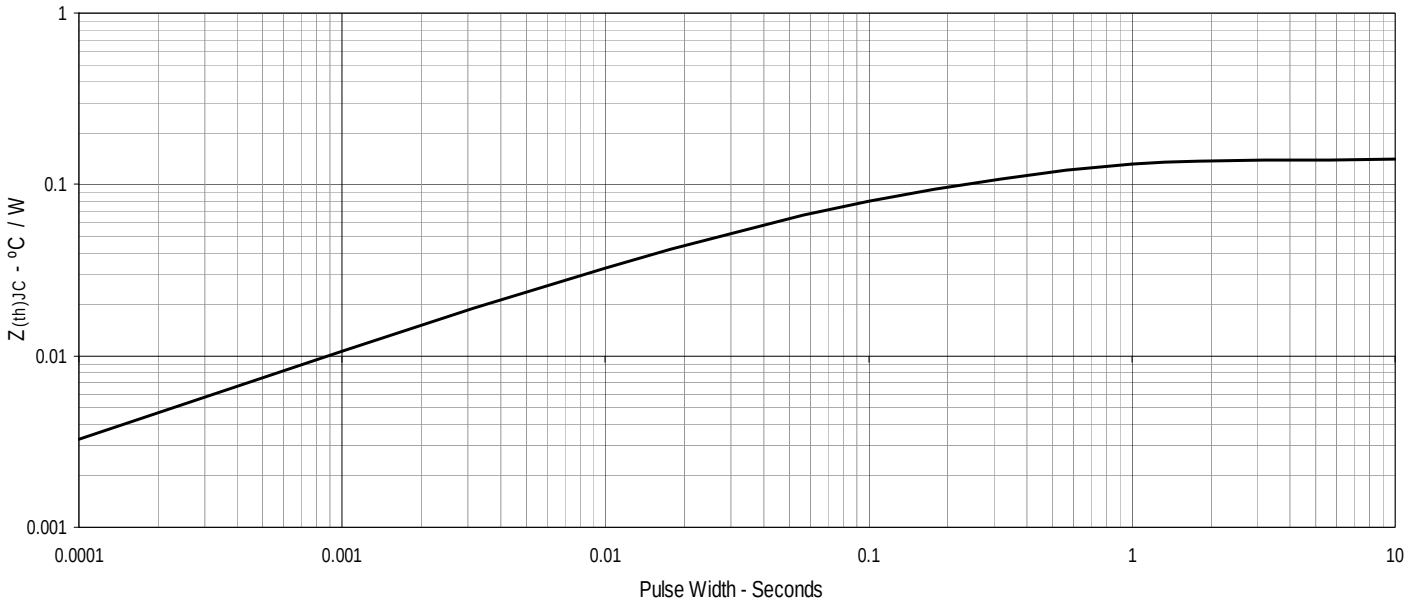


Fig. 12. Forward-Bias Safe Operating Area



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Fig. 13. Maximum Transient Thermal Impedance



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