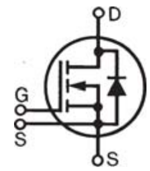
Polar™ HiPerFET™ Power MOSFET

IXFN300N10P

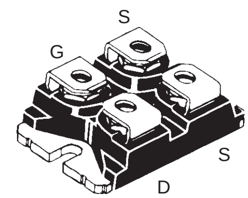
V_{DSS} = 100V
I_{D25} = 295A
$R_{DS(on)}$ ≤ 5.5mΩ
t_{rr} ≤ 200ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C		100	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ		100	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		± 30	V
I_{D25}	T_C = 25°C		295	A
I_{LRMS}	External Lead Current Limit		200	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		900	A
I_A	T_C = 25°C		100	A
E_{AS}	T_C = 25°C		3	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

miniBLOC
E153432



G = Gate D = Drain
S = Source

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

Features

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

Advantages

- High Power Density
- Easy to Mount
- Space Savings

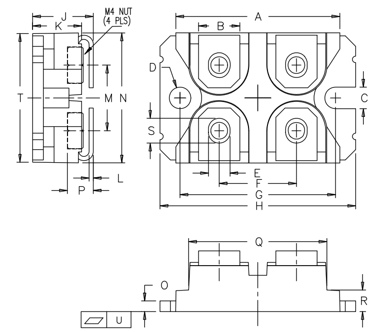
Applications

- 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

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 3mA	100			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8mA	2.5		5.0	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			1.5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A, Note 1			5.5	mΩ

Symbol	Test Conditions ($T_J = 25°C$, Unless Otherwise Specified)	Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	55	92		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		23		nF
C_{oss}			6100		pF
C_{rss}			417		pF
$t_{d(on)}$	**Resistive Switching Times**		36		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 100A		35		ns
$t_{d(off)}$	R_G = 1Ω (External)		56		ns
t_f			25		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 150A		279		nC
Q_{gs}			84		nC
Q_{gd}			107		nC
R_{thJC}				0.14	°C/W
R_{thCS}			0.05		°C/W

SOT-227B Outline (IXFN)



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

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25°C$, Unless Otherwise Specified)	Min.	Typ.	Max.	
I_S	V_{GS} = 0V			300	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			1000	A
V_{SD}	I_F = 100A, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 150A, -di/dt = 100A/μs			200	ns
Q_{RM}	V_R = 50V		0.71		μC
I_{RM}			10		A

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

Fig. 1. Extended Output Characteristics @ T_J = 25ºC

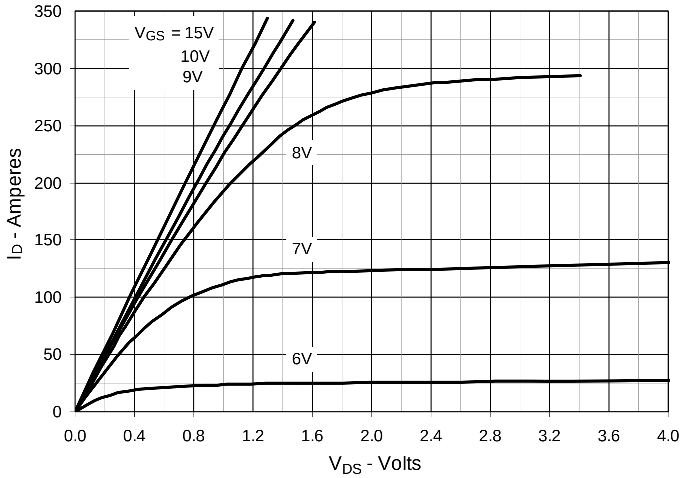


Fig. 2. Output Characteristics @ T_J = 150ºC

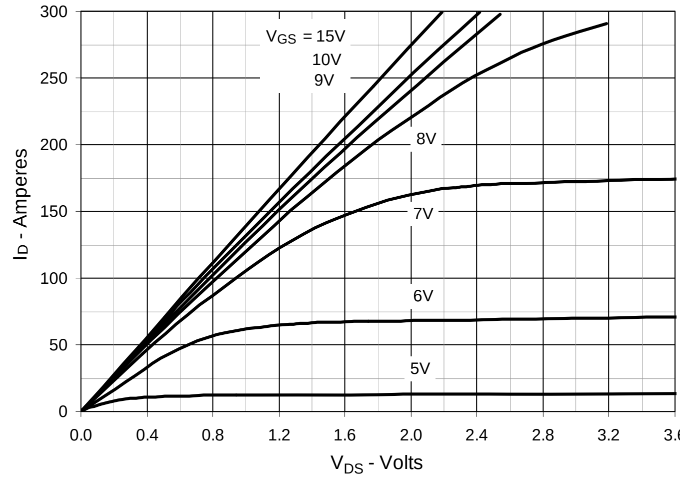


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 150A Value vs. Junction Temperature

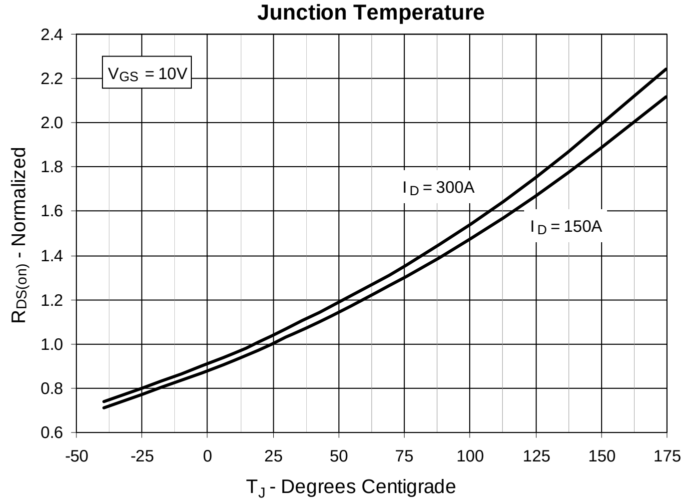


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 150A Value vs. Drain Current

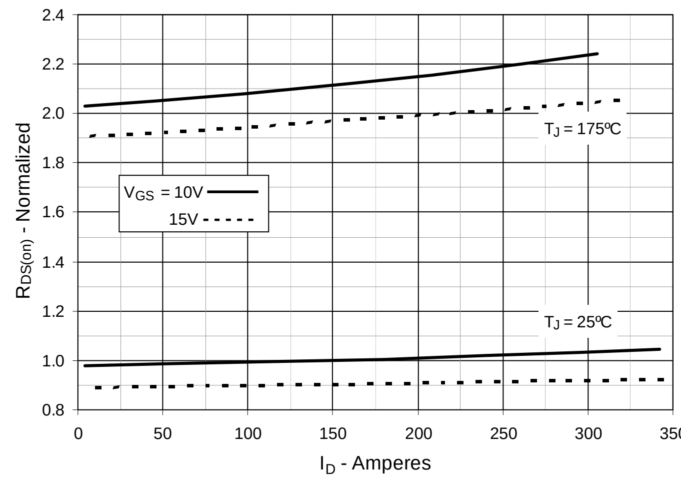


Fig. 5. Maximum Drain Current vs. Case Temperature

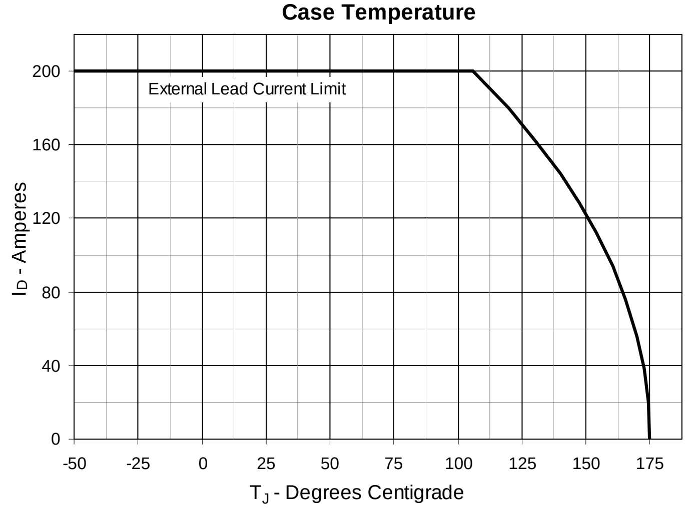


Fig. 6. Input Admittance

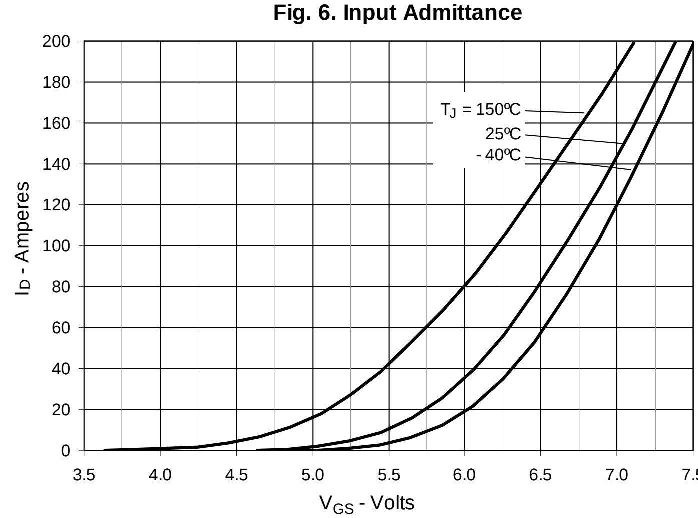


Fig. . Transconductance

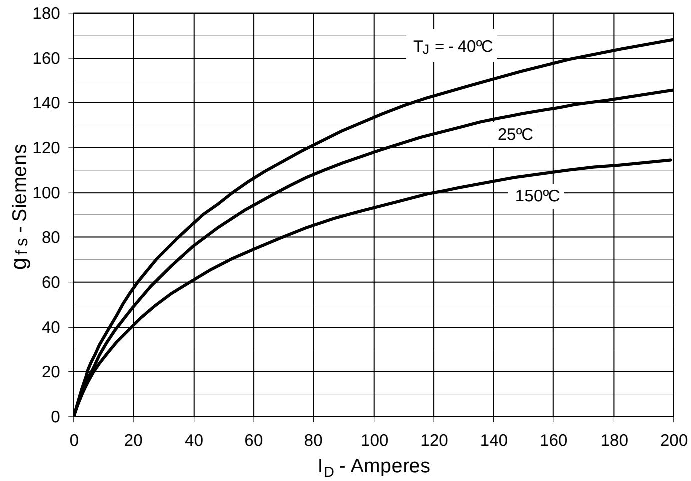


Fig. 8. Forward Voltage Drop of Intrinsic Diode

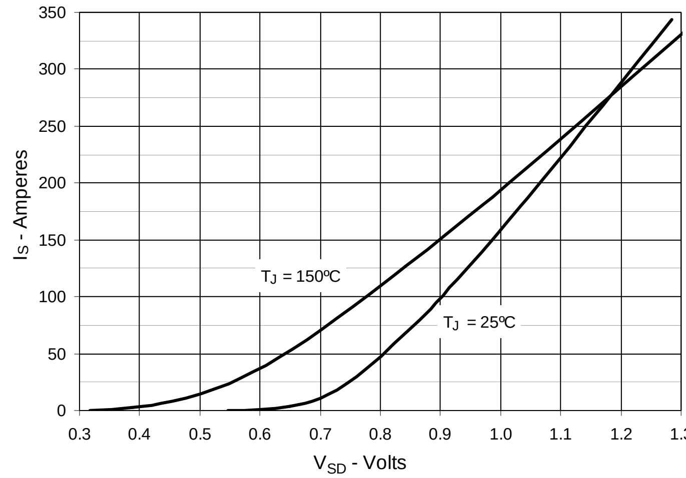


Fig. 9. Gate Charge

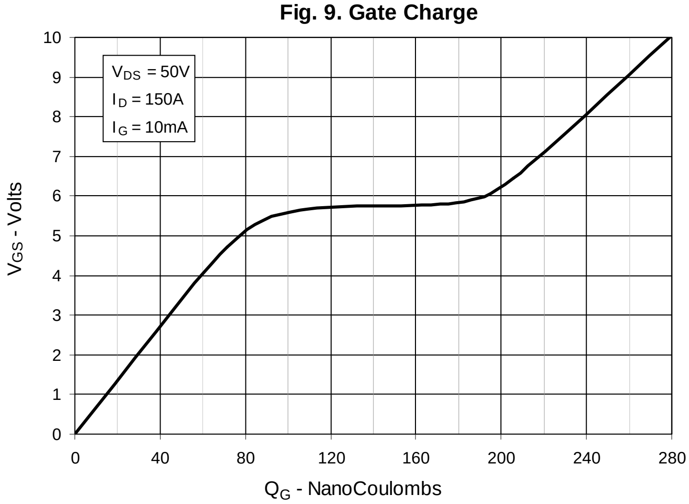


Fig. 10. Capacitance

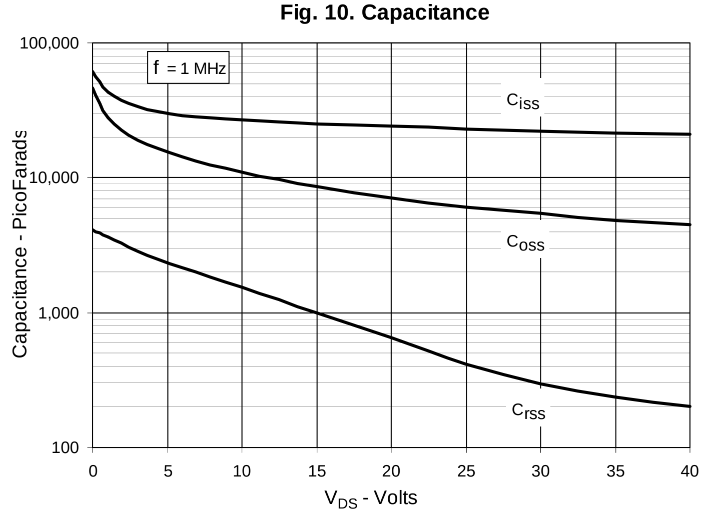


Fig. 11. Forward-Bias Safe Operating Area

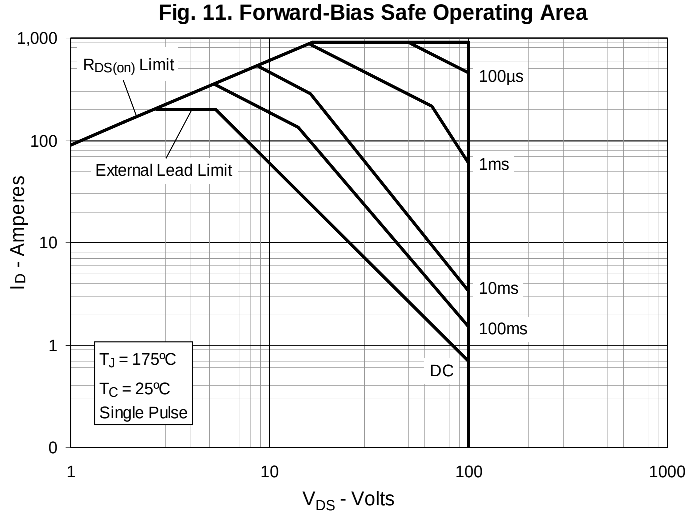
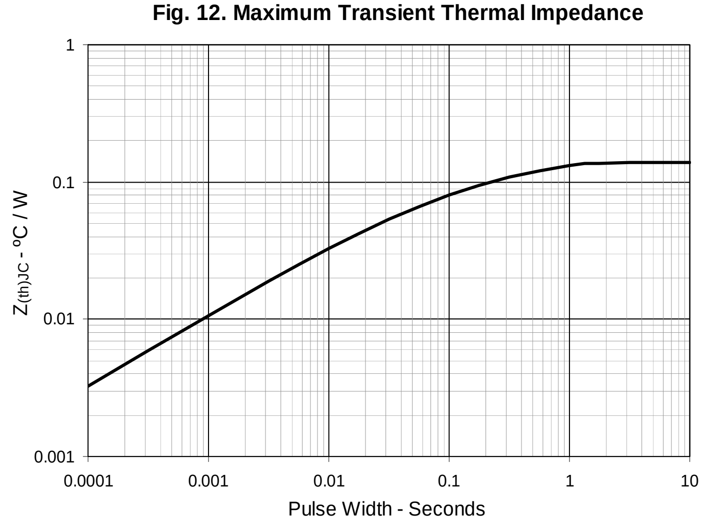


Fig. 12. Maximum Transient Thermal Impedance



IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.