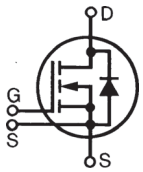
IXYS

PolarHV™ HiPerFET Power MOSFET

IXFN 80N50P

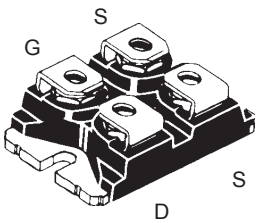
V_{DSS} = 500 V
I_{D25} = 66 A
$R_{DS(on)}$ ≤ 65 mΩ
t_{rr} ≤ 200 ns

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 150° C	500	V
V_{DGR}	T_J = 25° C to 150° C; R_{GS} = 1 MΩ	500	V
V_{GS}	Transient	± 40	V
V_{GSM}	Continuous	± 30	V
I_{D25}	T_C = 25° C	66	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	200	A
I_{AR}	T_C = 25° C	80	A
E_{AR}	T_C = 25° C	80	mJ
E_{AS}	T_C = 25° C	3.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, $T_J \le$150° C, R_G = 2 Ω	10	V/ns
P_D	T_C = 25° C	700	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
V_{ISOL}	50/60 Hz; $I_{ISOL} \le$1 mA	2500	V~
M_d	Mounting torque	1.5/13	Nm/ib.in.
	Terminal connection torque (M4)	1.5/13	Nm/ib.in.
Weight		30	g

miniBLOC, SOT-227 B (IXFN)
E153432



G = Gate D = Drain
S = Source

Either source tab S can be used forsource current or Kelvin gate return.

Symbol	Test Conditions (T_J = 25° C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 500 μA	500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8 mA	3.0		5.0	V
I_{GSS}	V_{GS} = ±30 V_{DC}, V_{DS} = 0			± 200	nA
I_{DSS}	$V_{DS} = V_{DSS}$			25	μA
	V_{GS} = 0 V T_J = 125° C			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25}, Note 1			65	mΩ

Features
- Fast intrinsic diode
- International standard package
- Unclamped Inductive Switching (UIS) rated
- UL recognized.
- Isolated mounting base

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

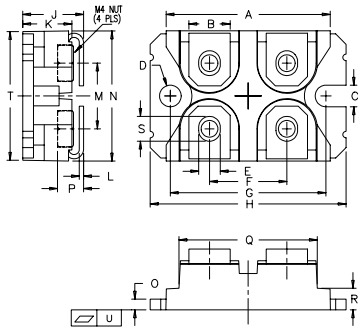
Symbol	Test Conditions (T_J = 25° C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; I_D = 0.5 I_{D25}, Note 1	35	70		S
C_{iss}			12.7		nF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1280		pF
C_{rss}			120		pF
$t_{d(on)}$			25		ns
t_r	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5*I_{D25}		27		ns
$t_{d(off)}$	R_G = 2 Ω (External)		70		ns
t_f			18		ns
$Q_{g(on)}$			195		nC
Q_{gs}	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		70		nC
Q_{gd}			64		nC
R_{thJC}				0.18	° C/W
R_{thCK}			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} = 0 V			80	A
I_{SM}	Repetitive			200	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/μs			200	ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		0.8		μC
I_{RM}			8		A

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

miniBLOC, SOT-227B (IXFN) 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

Fig. 1. Output Characteristics @ 25°C

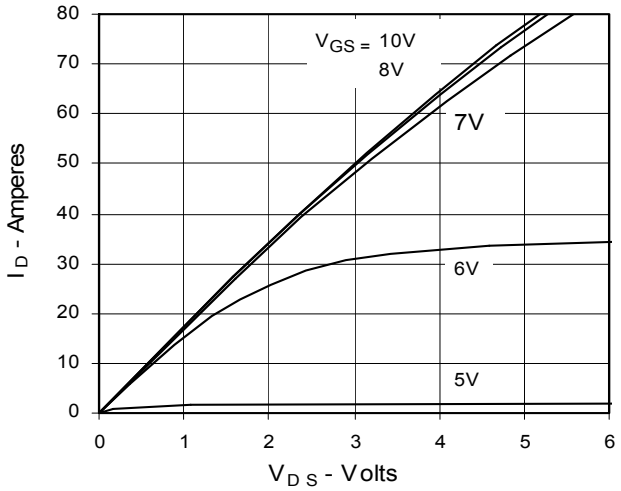


Fig. 2. Extended Output Characteristics @ 25°C

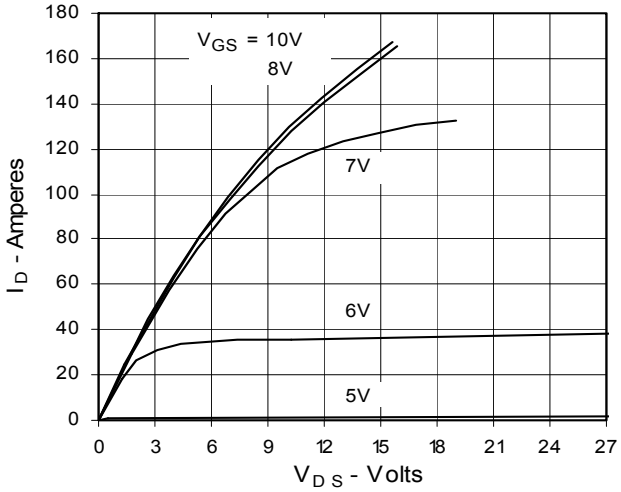


Fig. 3. Output Characteristics @ 125°C

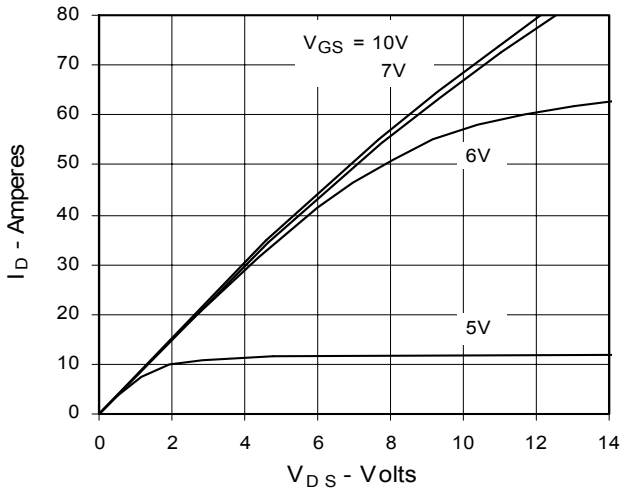


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Junction Temperature

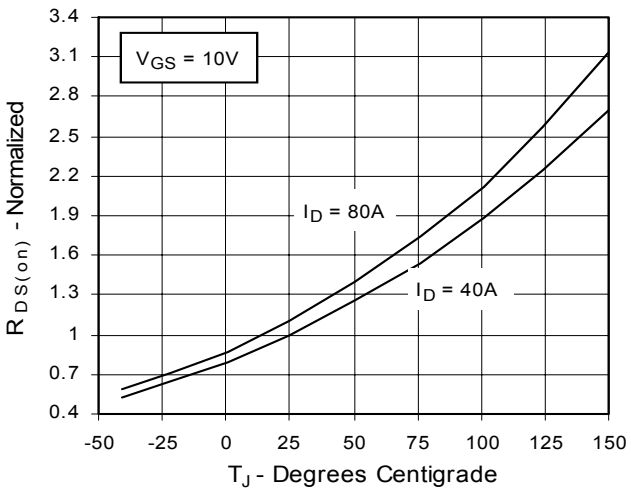


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Drain Current

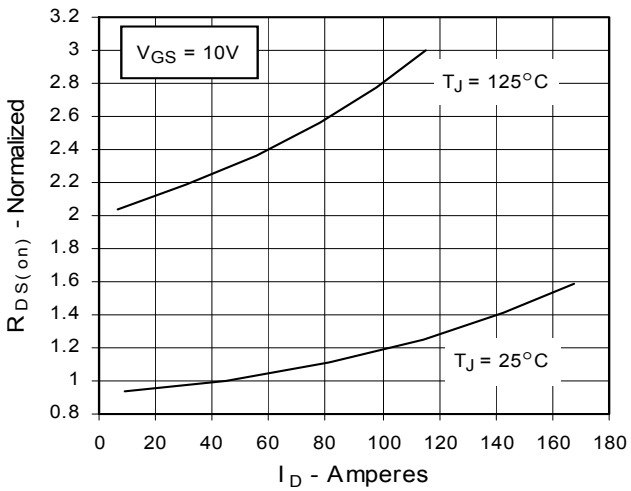


Fig. 6. Drain Current vs. Case Temperature

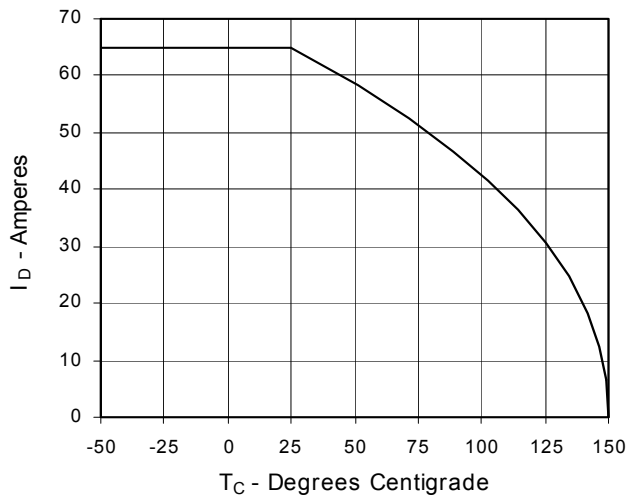


Fig. 7. Input Admittance

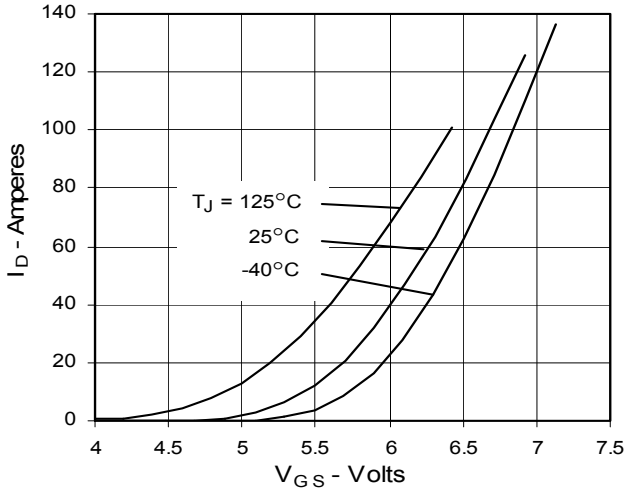


Fig. 8. Transconductance

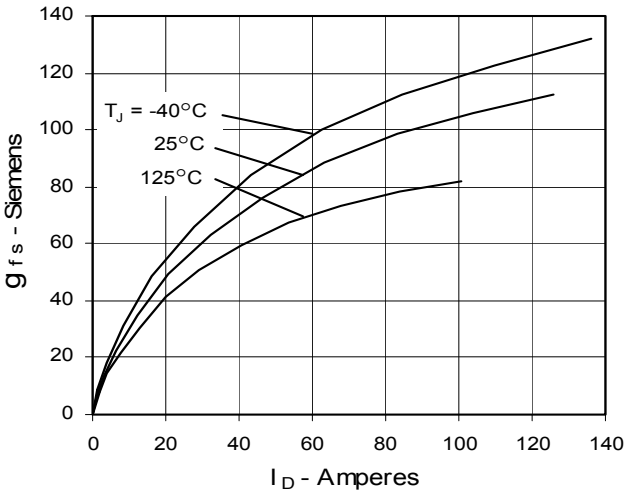


Fig. 9. Source Current vs. Source-To-Drain Voltage

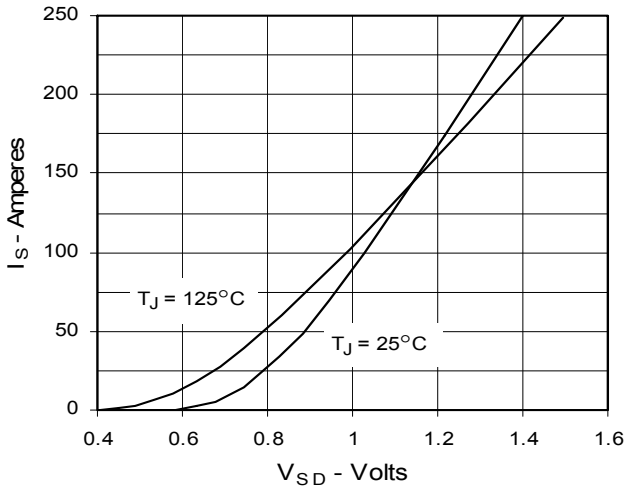


Fig. 10. Gate Charge

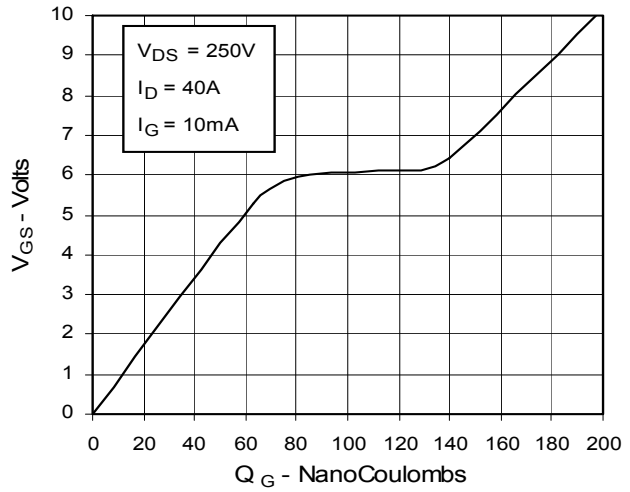


Fig. 11. Capacitance

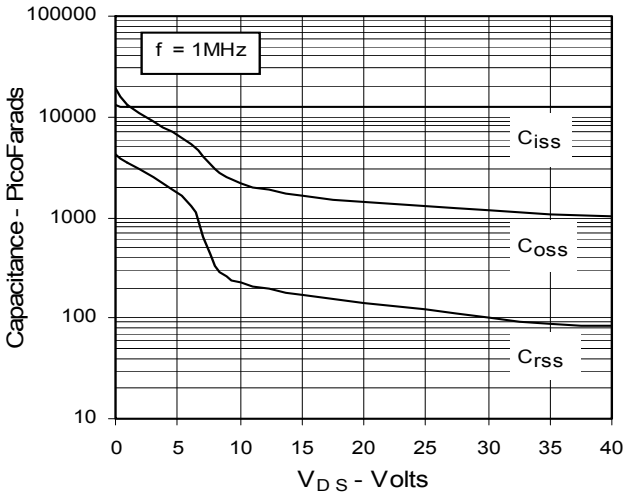


Fig. 12. Forward-Bias Safe Operating Area

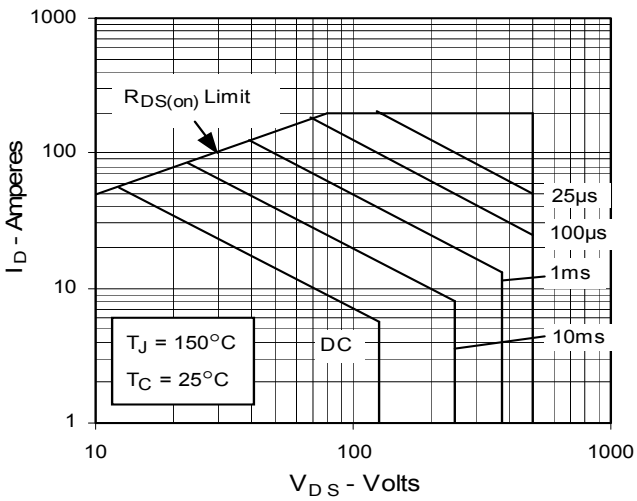


Fig. 13. Maximum Transient Thermal Resistance