

PolarHV™ HiPerFET IXFN 100N50P

Power MOSFET

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

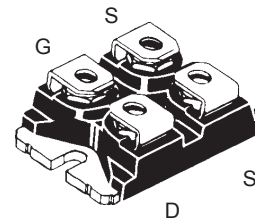


$V_{DSS} = 500 \text{ V}$
 $I_{D25} = 90 \text{ A}$
 $R_{DS(on)} \leq 49 \text{ m}\Omega$
 $t_{rr} \leq 200 \text{ ns}$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	500	V
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	90	A
I_{DRMS}	External lead current limit	75	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	250	A
I_{AR}	$T_C = 25^\circ\text{C}$	100	A
E_{AR}	$T_C = 25^\circ\text{C}$	100	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	5	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	20	V/ns
P_D	$T_C = 25^\circ\text{C}$	1040	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, 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	1.5 / 13	Nm/lb.in.
Weight	SOT-227B	30	g

miniBLOC, SOT-227 B (IXFN)

E153432



G = Gate
S = Source
D = Drain

Either Source terminal S can be used as the Source terminal or the Kelvin Source (gate return) terminal.

Features

- International standard package
- Encapsulating epoxy meets UL 94 V-0, flammability classification
- miniBLOC with Aluminium nitride isolation
- † Fast recovery diode
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance - easy to drive and to protect

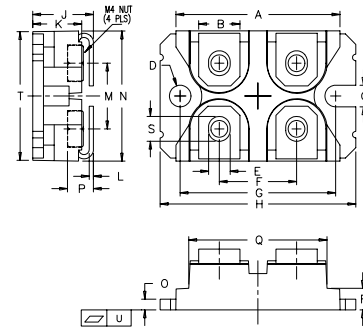
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 3 \text{ mA}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8 \text{ mA}$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 200 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			25 μA
				2000 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = I_T$, Note 1			49 $\text{m}\Omega$

Advantages

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

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
($T_J = 25^\circ\text{C}$, unless otherwise specified)				
g_{fs}	$V_{DS} = 20\text{ V}; I_D = I_T$, Note 1	50	80	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		20	nF
C_{oss}			1700	pF
C_{rss}			140	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External)		36	ns
t_r			29	ns
$t_{d(off)}$			110	ns
t_f			26	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$		240	nC
Q_{gs}			96	nC
Q_{gd}			78	nC
R_{thJC}			0.12	$^\circ\text{C/W}$
R_{thCS}		0.05		$^\circ\text{C/W}$

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

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
($T_J = 25^\circ\text{C}$, unless otherwise specified)				
I_S	$V_{GS} = 0\text{ V}$		100	A
I_{SM}	Repetitive		250	A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Note 1		1.5	V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}$		200	ns
Q_{RM}			0.6	μC
I_{RM}		6.0	A	

Notes:

1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

Test current $I_T = 50\text{ A}$

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

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one or more of the following U.S. patents: 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
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

Fig. 1. Output Characteristics @ 25°C

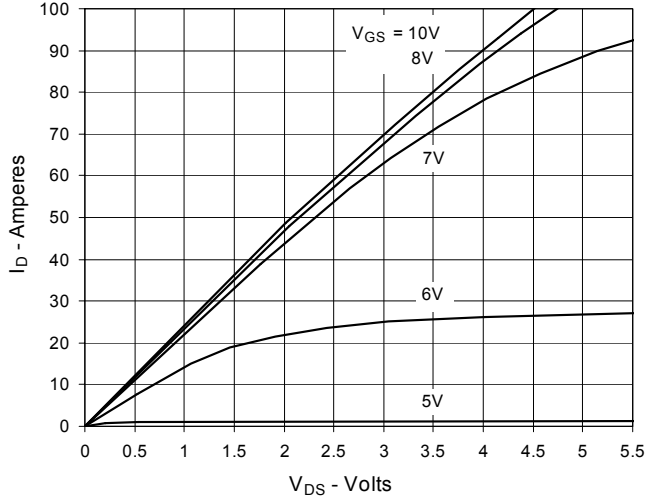


Fig. 2. Extended Output Characteristics @ 25°C

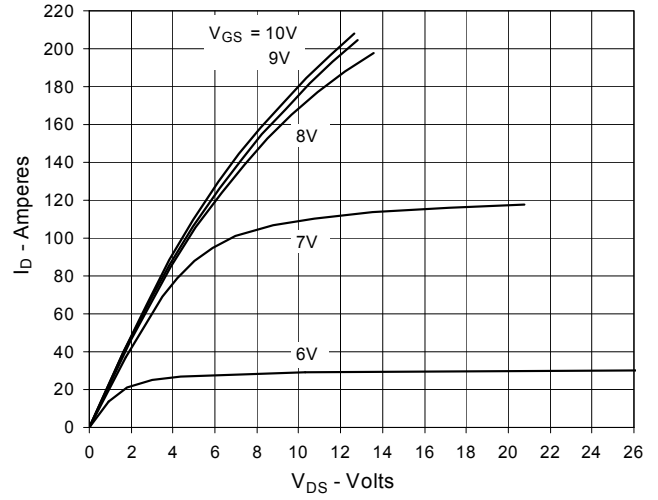


Fig. 3. Output Characteristics @ 125°C

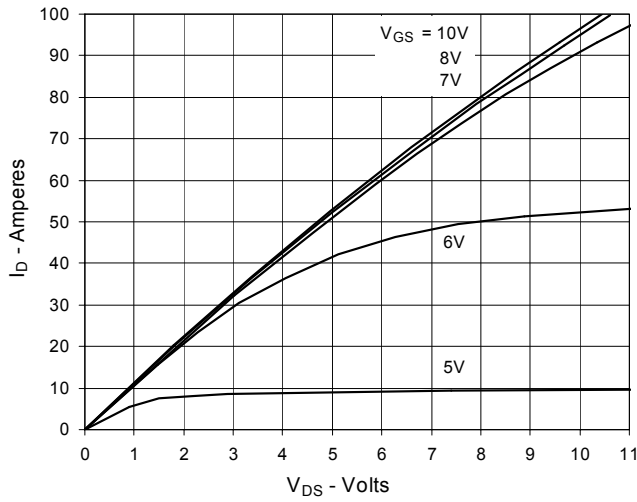


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 50A$ Value vs. Junction Temperature

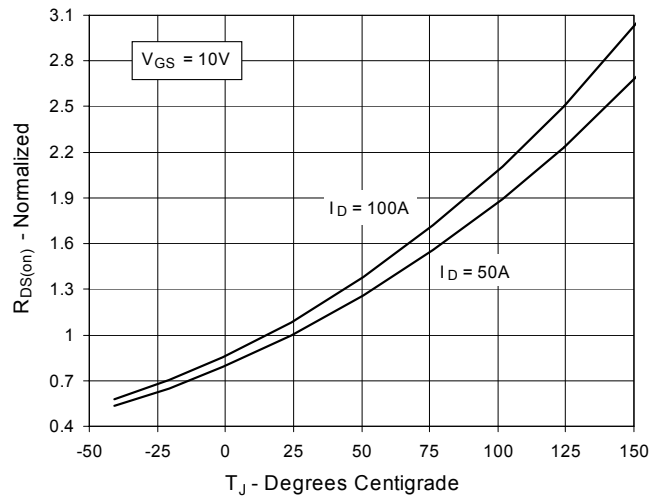


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 50A$ Value vs. Drain Current

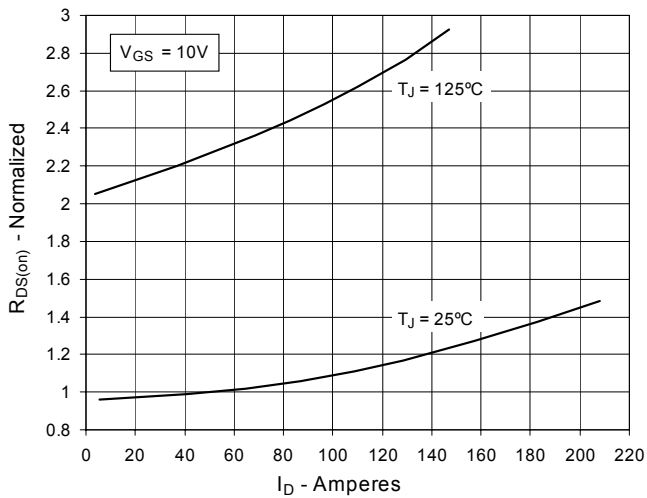


Fig. 6. Maximum Drain Current vs. Case Temperature

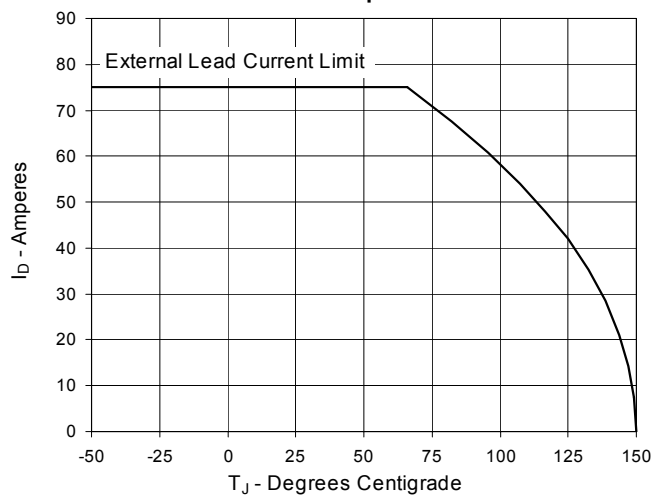


Fig. 7. Input Admittance

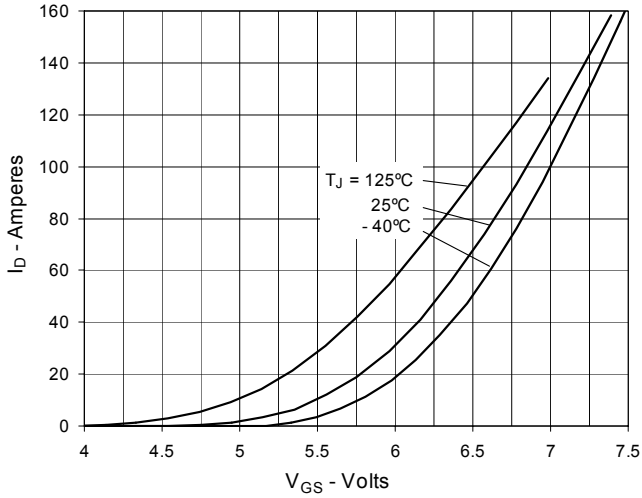


Fig. 8. Transconductance

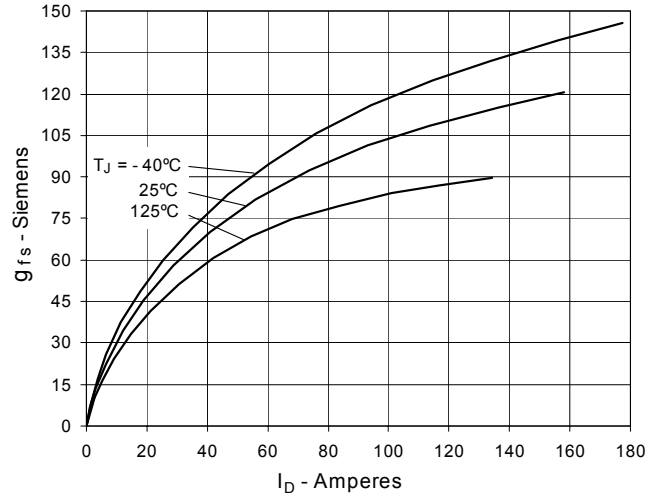


Fig. 9. Forward Voltage Drop of Intrinsic Diode

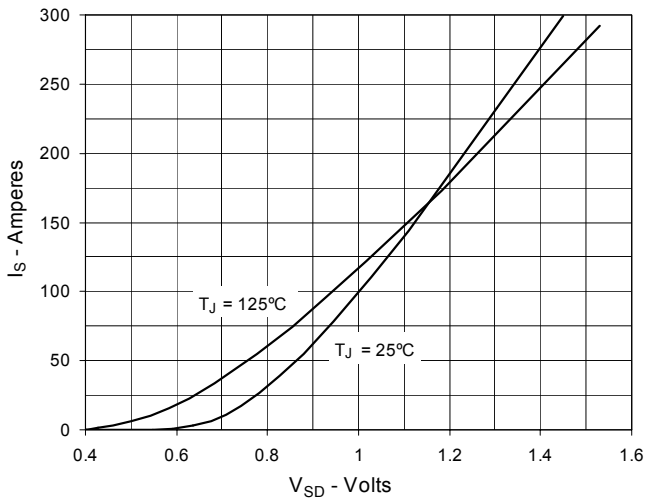


Fig. 10. Gate Charge

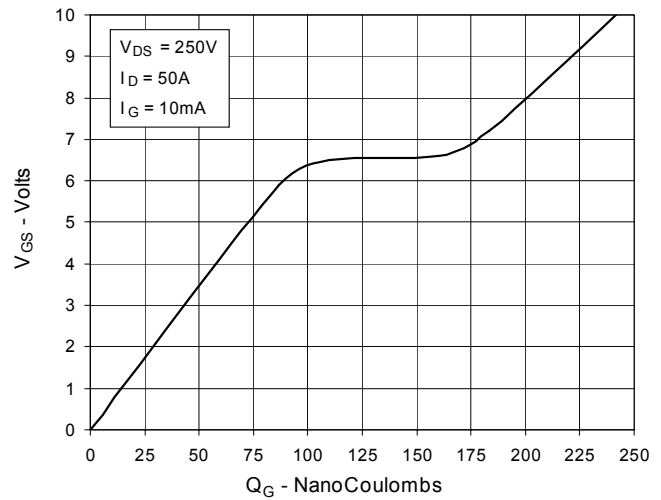


Fig. 11. Capacitance

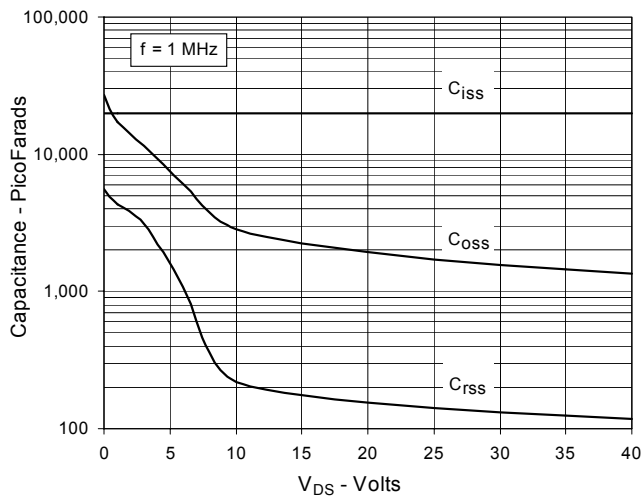
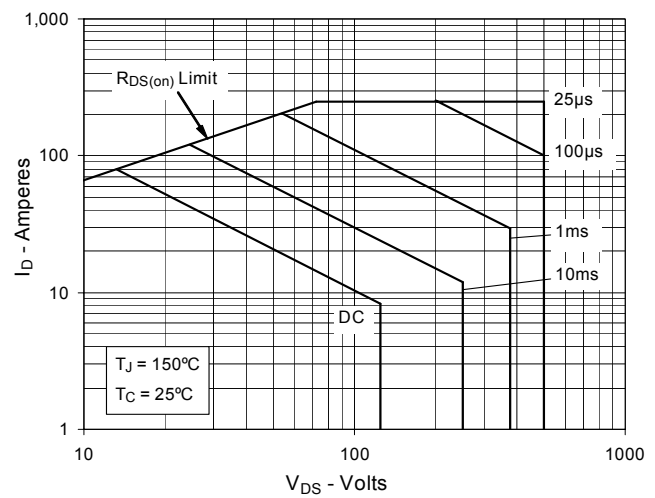


Fig. 12. Forward-Bias Safe Operating Area



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Fig. 13. Maximum Transient Thermal Resistance

