

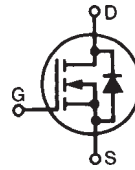
PolarHV™ HiPerFET Power MOSFET

IXFN 48N60P

$$\begin{aligned} V_{DSS} &= 600 \text{ V} \\ I_{D25} &= 48 \text{ A} \\ R_{DS(on)} &\leq 135 \text{ m}\Omega \\ t_{rr} &\leq 250 \text{ ns} \end{aligned}$$

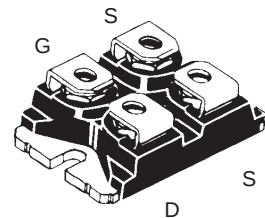
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

Preliminary Data Sheet



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	600	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	600	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	48	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	110	A
I_{AR}	$T_C = 25^\circ\text{C}$	48	A
E_{AR}	$T_C = 25^\circ\text{C}$	70	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	2.0	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 4 \Omega$	20	V/ns
P_D	$T_C = 25^\circ\text{C}$	830	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque Terminal connection torque (M4)	1.5/13 Nm/lb.in. 1.5/13 Nm/lb.in.	
Weight	SOT-227B	30	g
V_{ISOL}	50/60 Hz $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	2500 3000	V~ V~
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$

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 packages
- 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

Advantages

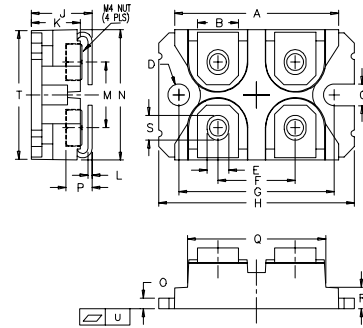
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	600		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 1000 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$			135 m Ω

Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{ V}; I_D = 0.5 I_{D25}$, pulse test	35	53	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		8860	pF
C_{oss}			850	pF
C_{rss}			60	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 I_{D25}$ $R_G = 2\ \Omega$ (External)		30	ns
t_r			25	ns
$t_{d(off)}$			85	ns
t_f			22	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		150	nC
Q_{gs}			50	nC
Q_{gd}			50	nC
R_{thJC}	SOT-227B		0.15	K/W
R_{thCK}			0.05	K/W

Source-Drain Diode		Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			48 A
I_{SM}	Repetitive			110 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 20\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 480\text{ V}$		0.8	250 ns
Q_{RM}				μC
I_{RM}				A

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

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	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585
	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	

Fig. 1. Output Characteristics
@ 25°C

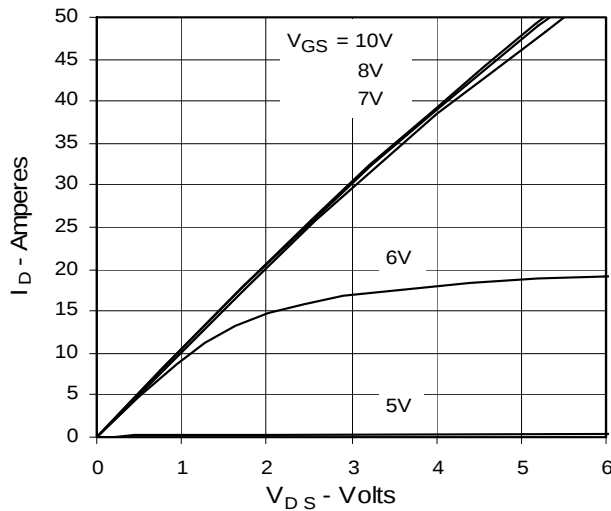


Fig. 2. Extended Output Characteristics
@ 25°C

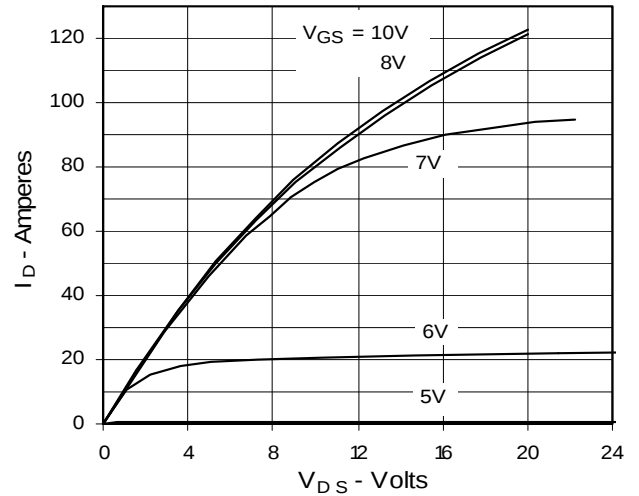


Fig. 3. Output Characteristics
@ 125°C

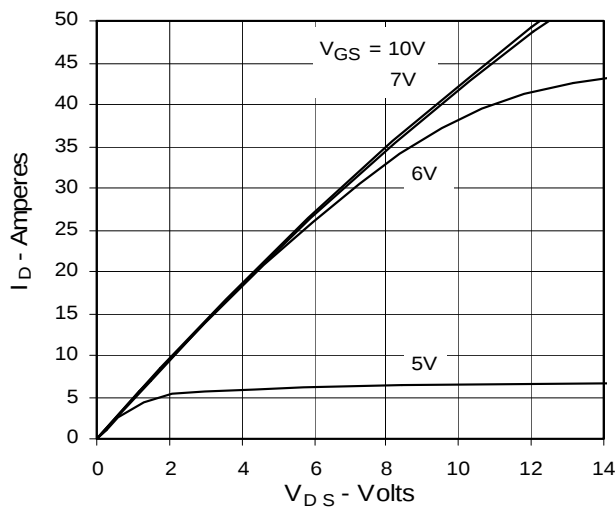


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

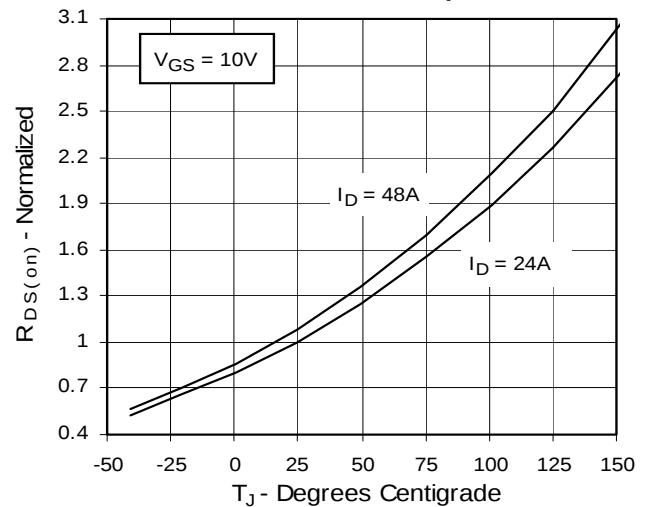


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

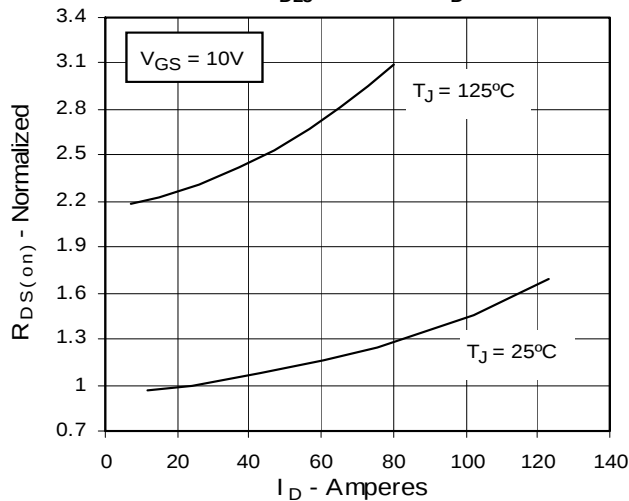


Fig. 6. Drain Current vs. Case Temperature

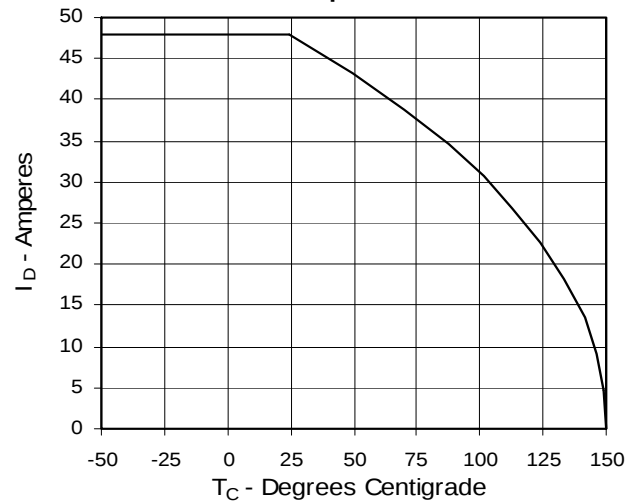


Fig. 7. Input Admittance

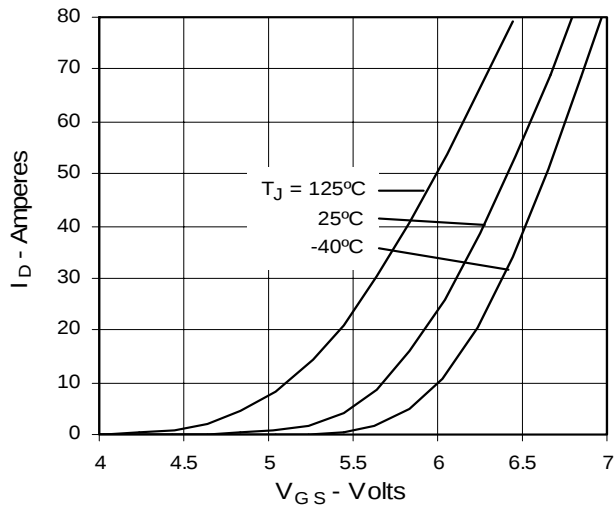


Fig. 8. Transconductance

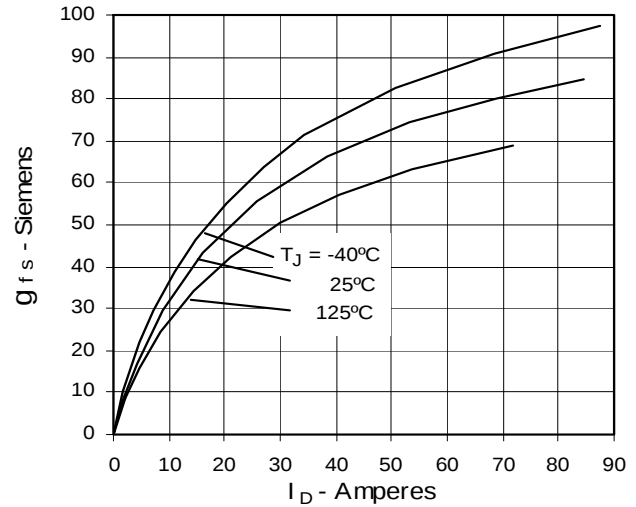


Fig. 9. Source Current vs. Source-To-Drain Voltage

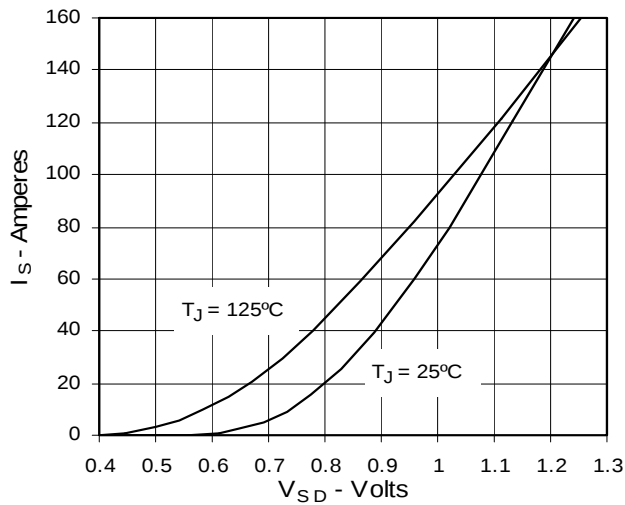


Fig. 10. Gate Charge

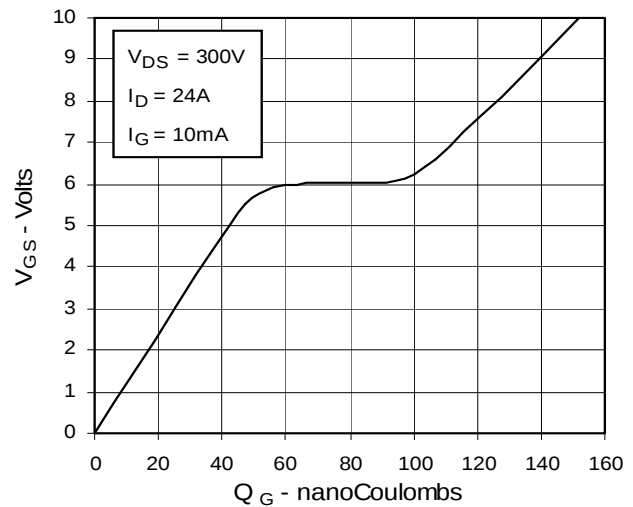


Fig. 11. Capacitance

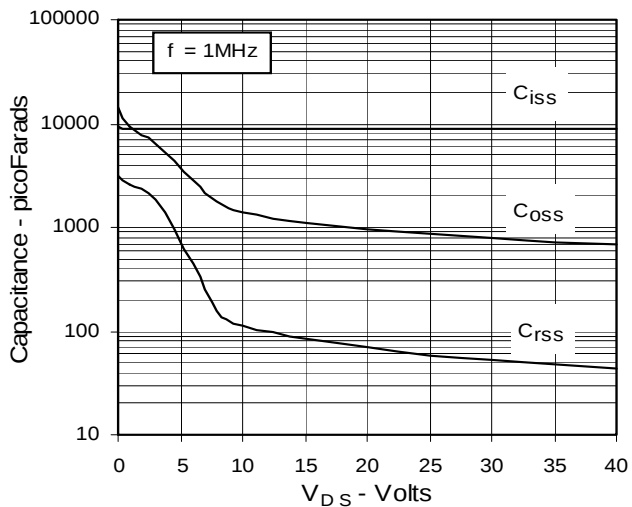


Fig. 13. Maximum Transient Thermal Resistance

