

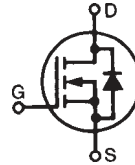
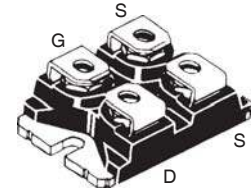
Polar3™ HiPerFET™
Power MOSFET
IXFN80N60P3

$$V_{DSS} = 600V$$

$$I_{D25} = 66A$$

$$R_{DS(on)} \leq 70m\Omega$$

$$t_{rr} \leq 250ns$$

 N-Channel Enhancement Mode
 Fast Intrinsic Rectifier

 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}	$T_J = 25^\circ C$ to $150^\circ C$	600	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	600	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$	66	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	200	A
I_A	$T_C = 25^\circ C$	40	A
E_{AS}	$T_C = 25^\circ C$	2	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$	35	V/ns
P_D	$T_C = 25^\circ C$	960	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
V_{ISOL}	50/60 Hz, RMS, $t = 1$ minute	2500	V~
	$I_{ISOL} \leq 1mA$, $t = 1s$	3000	V~
M_d	Mounting Torque for Base Plate	1.5/13	Nm/lb.in.
	Terminal Connection Torque	1.3/11.5	Nm/lb.in.
Weight		30	g

Features

- International Standard Package
- Low Intrinsic Gate Resistance
- miniBLOC with Aluminum Nitride Isolation
- Dynamic dv/dt Rating
- Avalanche Rated
- Fast Intrinsic Rectifier
- Low Q_G
- Low $R_{DS(on)}$
- Low Drain-to-Tab Capacitance
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

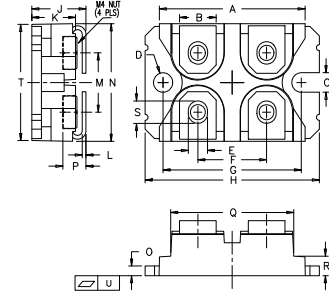
Applications

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

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 1mA$	600		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8mA$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$			50 μA 4 mA
	$T_J = 125^\circ C$			
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 40A$, Note 1			70 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 40\text{A}$, Note 1	55	90	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		13.1	nF
C_{oss}			1240	pF
C_{rss}			5.0	pF
R_{Gi}	Gate Input Resistance		1.0	Ω
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 40\text{A}$ $R_G = 1\Omega$ (External)		48	ns
t_r			25	ns
$t_{d(off)}$			87	ns
t_f			8	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 40\text{A}$		190	nC
Q_{gs}			56	nC
Q_{gd}			48	nC
R_{thJC}				0.13 $^\circ\text{C/W}$
R_{thCS}		0.05		$^\circ\text{C/W}$

SOT-227B (IXFN) Outline



(M4 screws (4x) supplied)

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

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			80 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			320 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 40\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$			250 ns
Q_{RM}			1.4	μC
I_{RM}			13.0	A

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

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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IXYS MOSFETs and IGBTs are covered 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 7,005,734 B2 7,157,338B2
by 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 7,063,975 B2
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 7,071,537

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

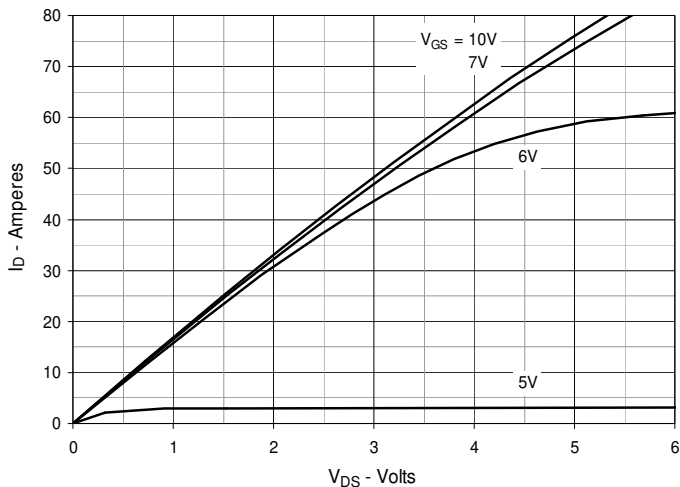


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

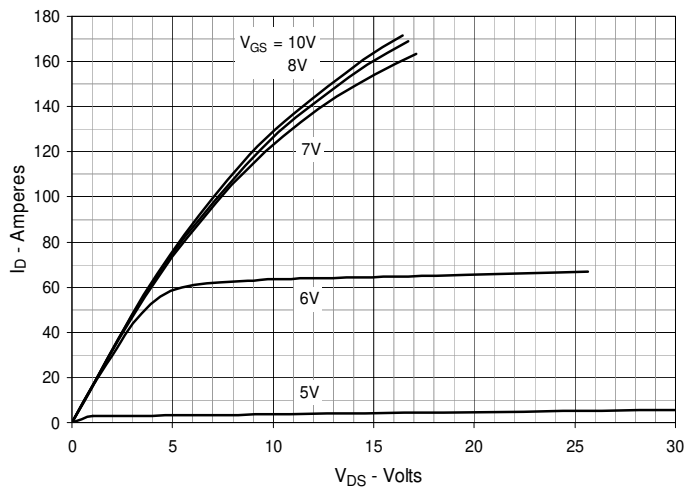


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

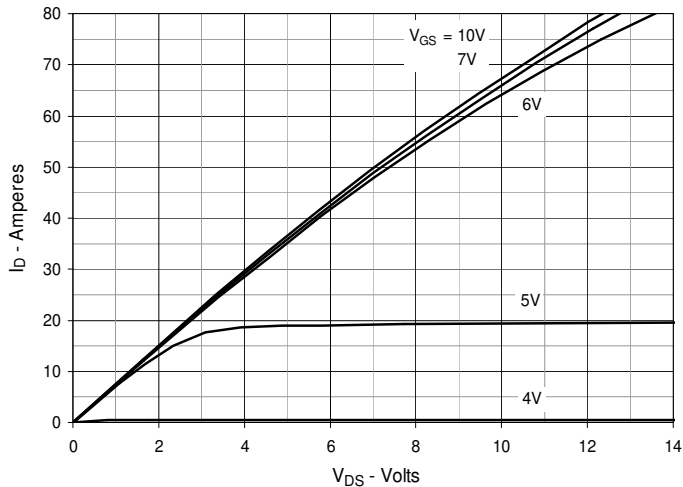


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 40\text{A}$ Value vs. Junction Temperature

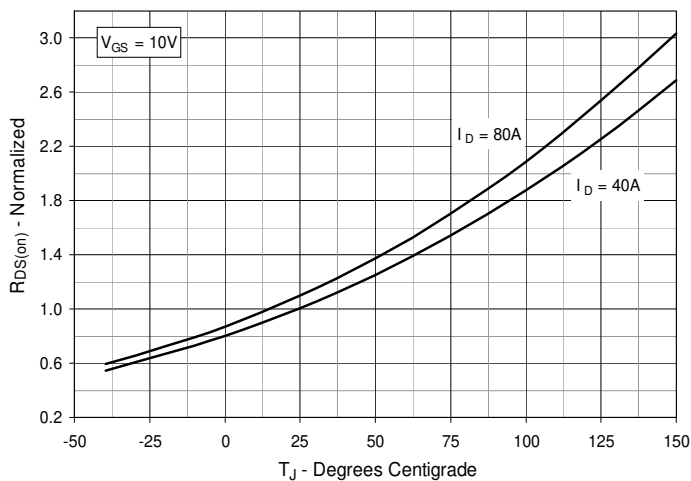


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 40\text{A}$ Value vs. Drain Current

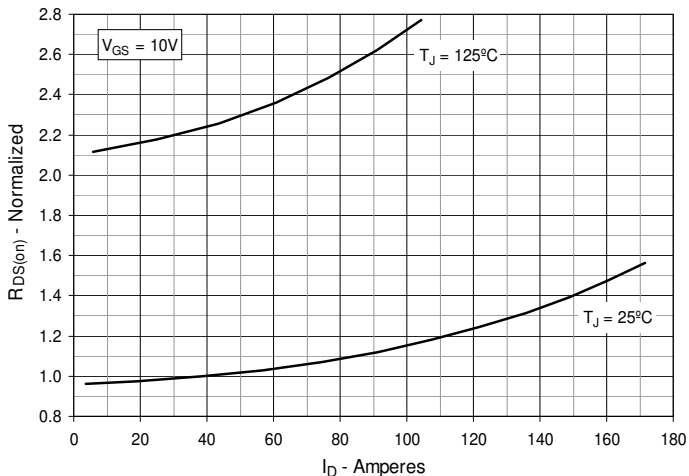


Fig. 6. Maximum Drain Current vs. Case Temperature

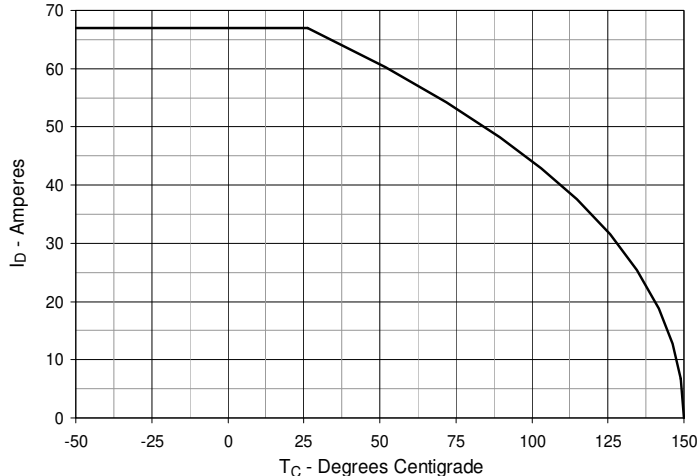


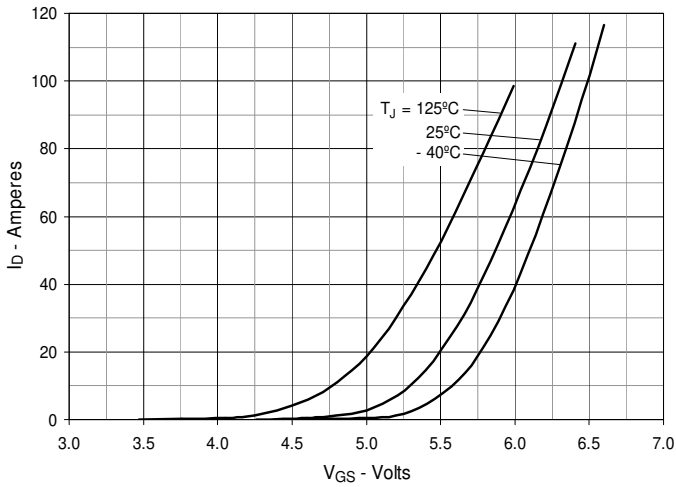
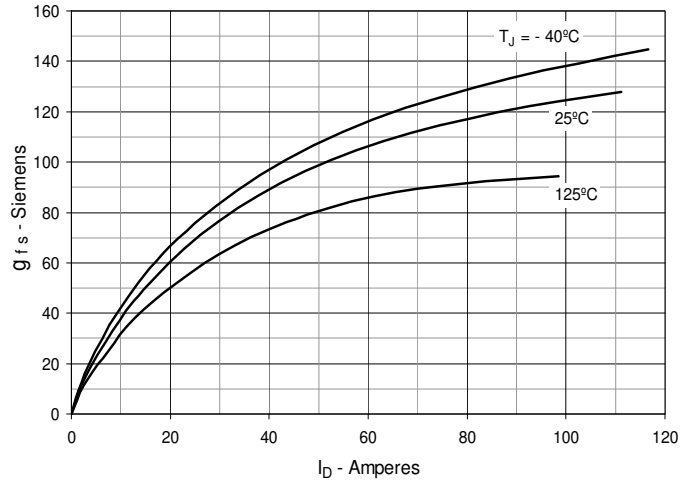
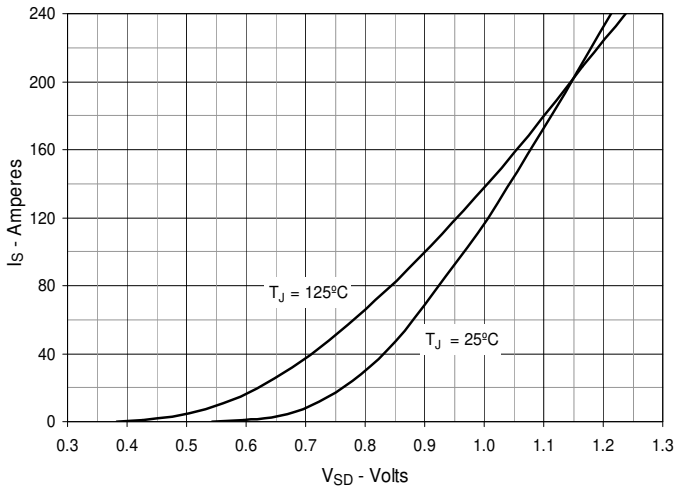
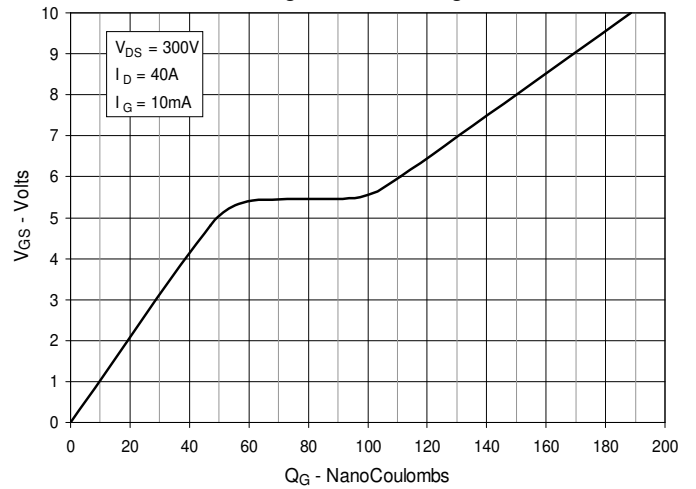
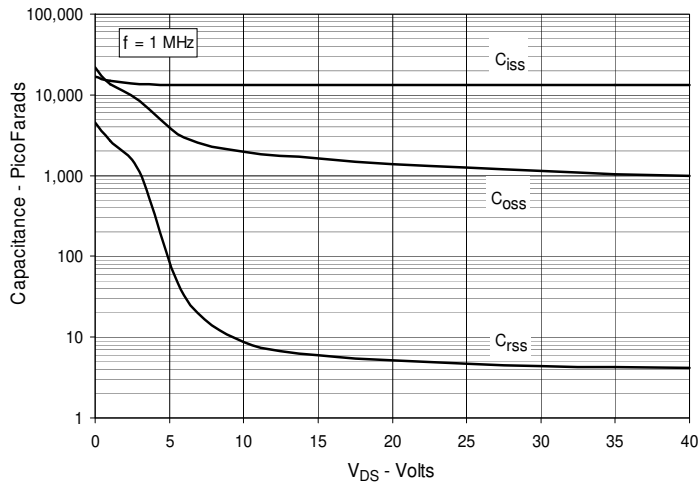
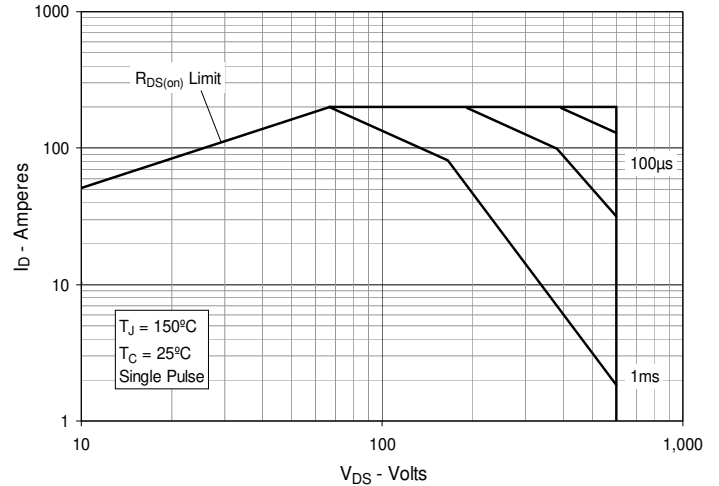
Fig. 7. Input Admittance

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


Fig. 13. Maximum Transient Thermal Impedance

