

# HiPerFET™ Power MOSFETs Single Die MOSFET

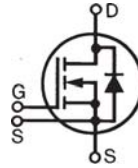
## IXFN280N085

$$V_{DSS} = 85V$$

$$I_{D25} = 280A$$

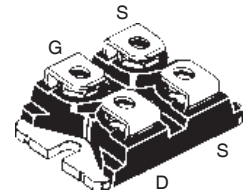
$$R_{DS(on)} \leq 4.4m\Omega$$

N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt, Low  $t_{rr}$



Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	85	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$	85	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ C$ , Chip capability	280	A
$I_{L(RMS)}$	External Lead Current Limit	200	A
$I_{DM}$	$T_C = 25^\circ C$ , pulse width limited by $T_{JM}$	1120	A
$I_A$	$T_C = 25^\circ C$	200	A
$E_{AS}$	$T_C = 25^\circ C$	4	J
<b>dv/dt</b>	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ C$	5	V/ns
$P_d$	$T_C = 25^\circ C$	700	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$V_{ISOL}$	50/60 Hz, RMS $t = 1min$ $I_{ISOL} \leq 1mA$ $t = 1s$	2500 3000	V~ V~
$M_d$	Mounting torque Terminal connection torque	1.5/13 1.3/11.5	Nm/lb.in. Nm/lb.in.
<b>Weight</b>		30	g

miniBLOC, SOT-227 B  
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  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Avalanche rated
- Guaranteed FBSOA
- Low package inductance
- Fast intrinsic Rectifier

### Advantages

- Easy to mount
- Space savings
- High power density

### Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ C$ , unless otherwise specified)		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 3mA$	85		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8mA$	2.0		V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 125^\circ C$			100 $\mu A$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 100A$ , Note 1			4.4 m $\Omega$

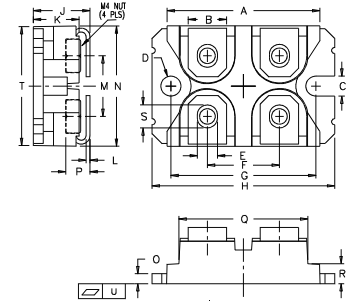
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{V}, I_D = 60\text{A}$ , Note 1	60	100	S
$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		19	nF
$C_{oss}$			6.4	nF
$C_{rss}$			3.2	nF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 60\text{A}$ $R_G = 1\Omega$ (External)		40	ns
$t_r$			150	ns
$t_{d(off)}$			112	ns
$t_f$			60	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 100\text{A}$		580	nC
$Q_{gs}$			77	nC
$Q_{gd}$			280	nC
$R_{thJC}$			0.18	$^\circ\text{C/W}$
$R_{thCS}$		0.05		$^\circ\text{C/W}$

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{V}$			280 A
$I_{SM}$	Repetitive, pulse width limited by $T_{JM}$			1120 A
$V_{SD}$	$I_F = 100\text{A}, V_{GS} = 0\text{V}$ , Note 1			1.2 V
$t_{rr}$	$I_F = 50\text{A}, -di/dt = 100\text{A}/\mu\text{s}, V_R = 50\text{V}$			200 ns
$Q_{RM}$			0.76	$\mu\text{C}$
$I_{RM}$			8.00	A

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

### miniBLOC, SOT-227 B



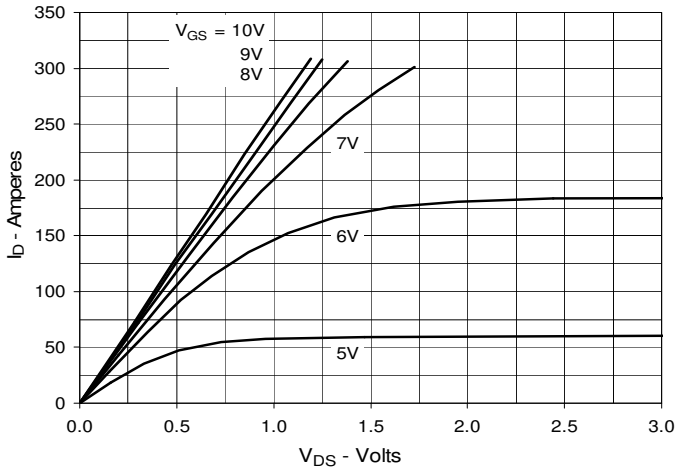
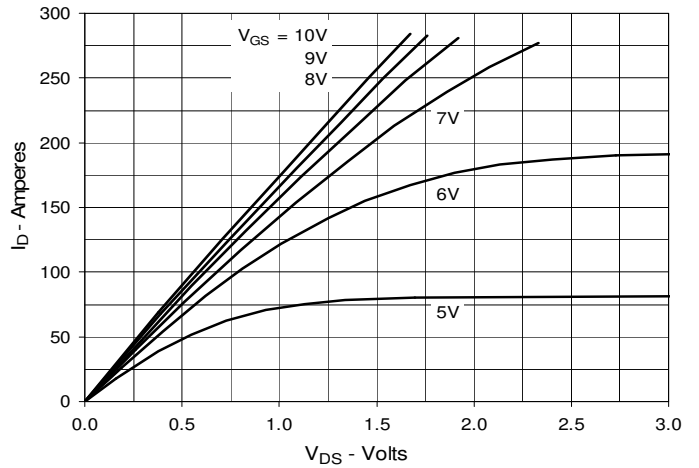
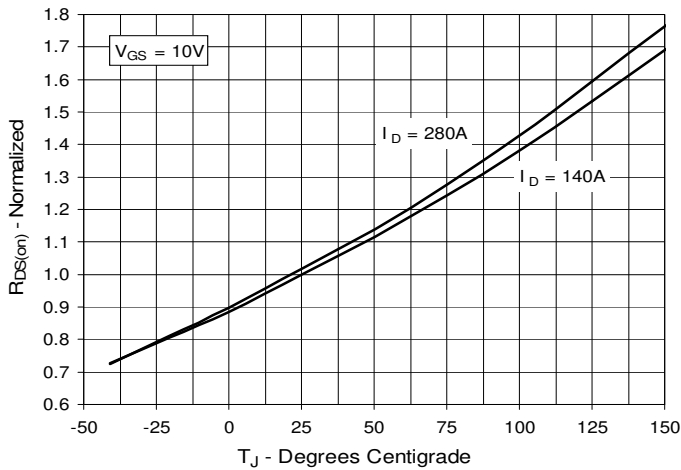
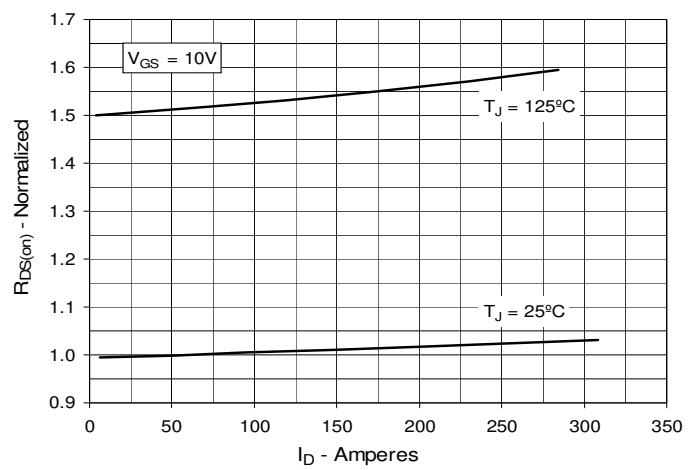
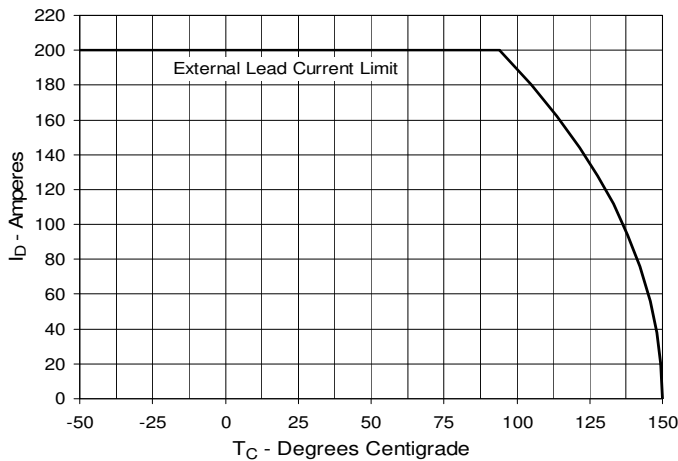
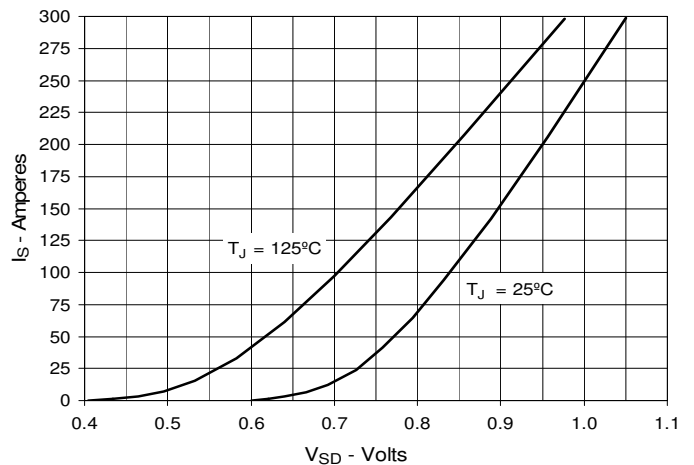
M4 screws (4x) supplied

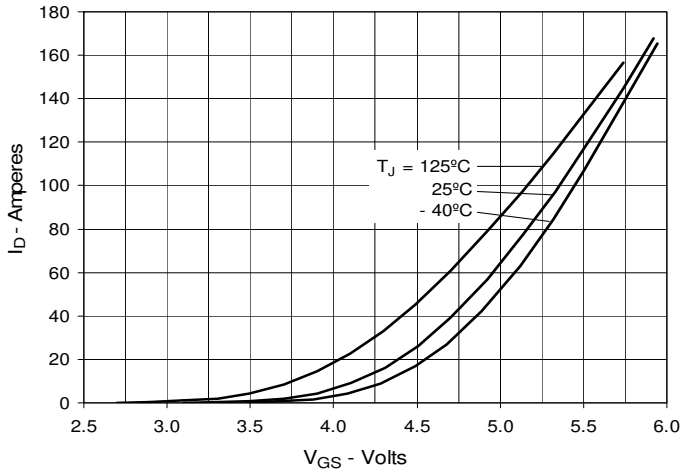
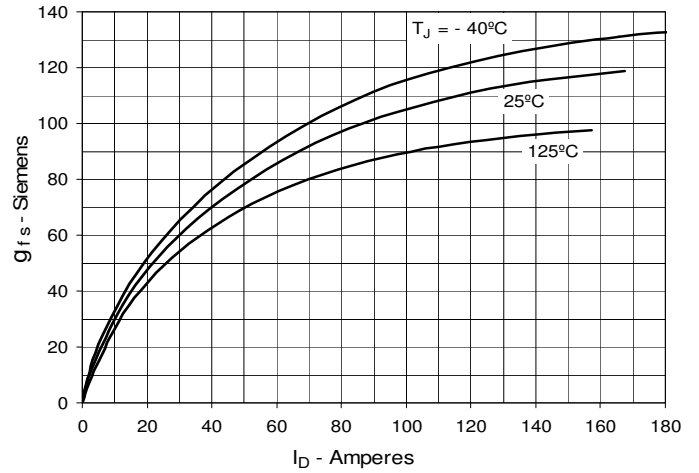
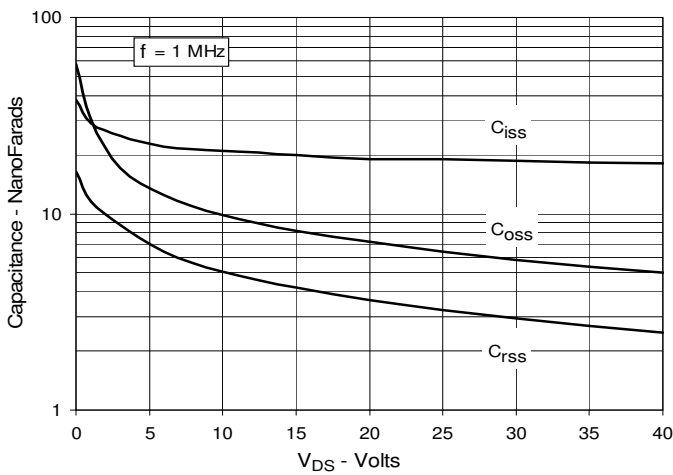
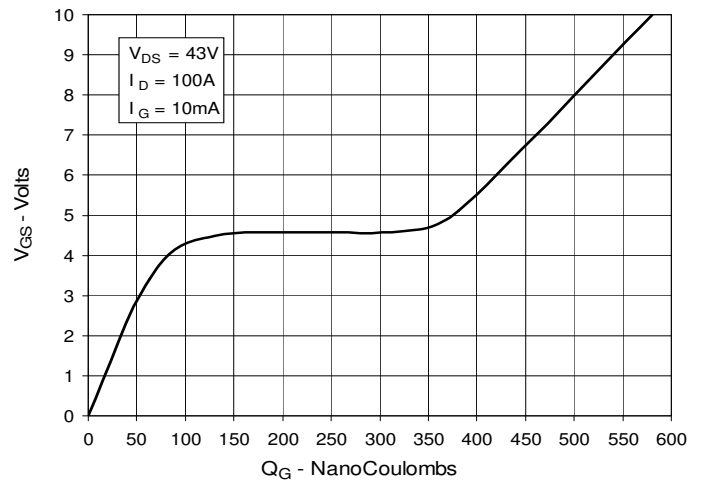
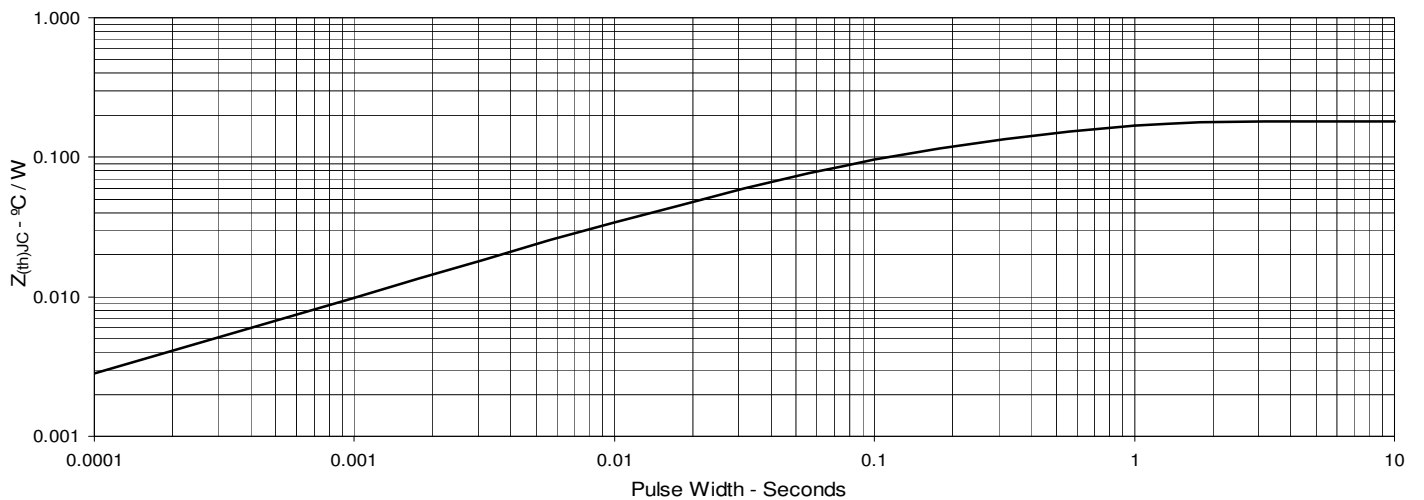
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	38.00	38.23	1.496	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004

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

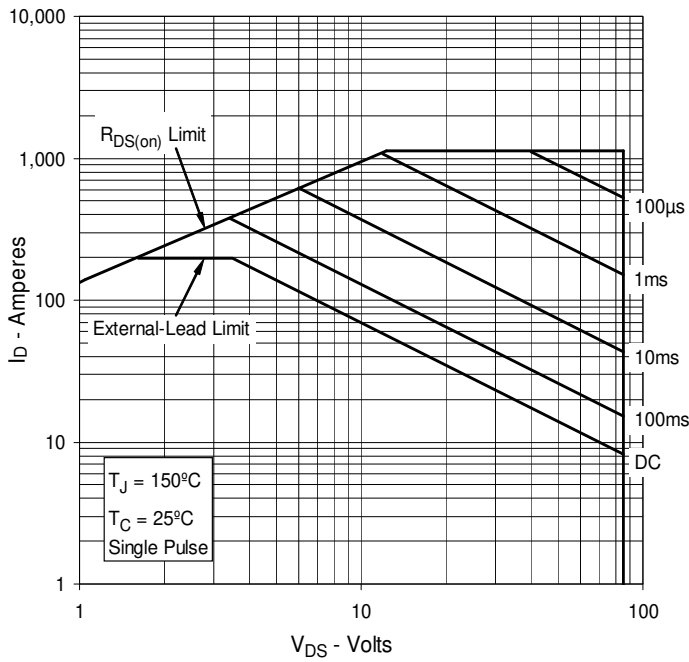
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

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	7,005,734 B2	7,157,338B2
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	

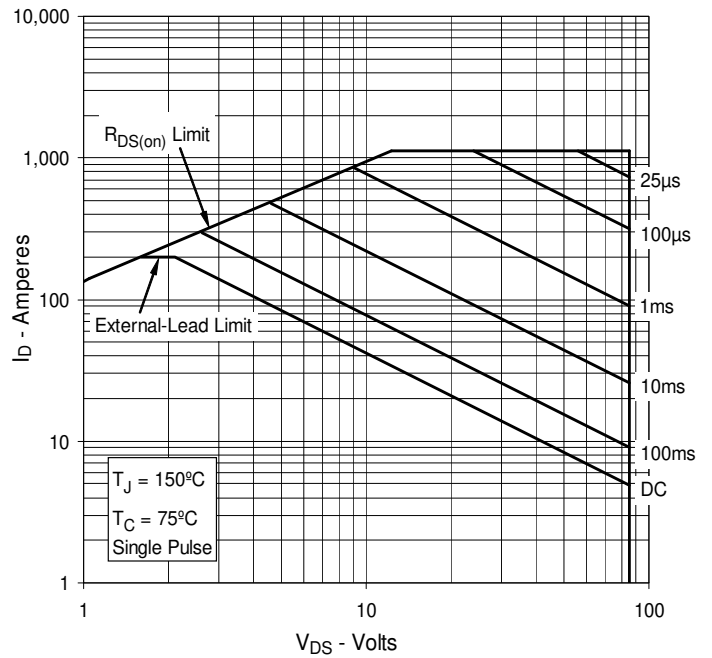
**Fig. 1. Extended Output Characteristics @ 25°C**

**Fig. 2. Output Characteristics @ 125°C**

**Fig. 3.  $R_{DS(on)}$  Normalized to  $I_D = 140A$  Value vs. Junction Temperature**

**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 140A$  Value vs. Drain Current**

**Fig. 5. Maximum Drain Current vs. Case Temperature**

**Fig. 6. Forward Voltage Drop of Intrinsic Diode**


**Fig. 7. Input Admittance**

**Fig. 8. Transconductance**

**Fig. 9. Capacitance**

**Fig. 10. Gate Charge**

**Fig. 11. Maximum Transient Thermal Impedance**


**Fig. 12. Forward-Bias Safe Operating Area  
@  $T_C = 25^\circ\text{C}$**



**Fig. 13. Forward-Bias Safe Operating Area  
@  $T_C = 75^\circ\text{C}$**





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