

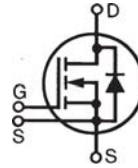
# HiPerFET™ Power MOSFET

Single MOSFET Die

IXFN 24N100  
IXFN 23N100

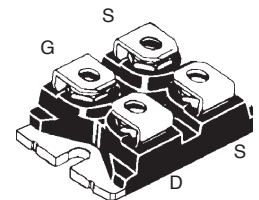
$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
1000 V	24 A	0.39 $\Omega$
1000 V	23 A	0.43 $\Omega$

$t_{rr} \leq 250$  ns



Symbol Test Conditions		Maximum Ratings		
$V_{DSS}$	$T_J = 25^{\circ}\text{C}$ to $150^{\circ}\text{C}$	1000	V	
$V_{DGR}$	$T_J = 25^{\circ}\text{C}$ to $150^{\circ}\text{C}$ , $R_{GS} = 1\text{M}\Omega$	1000	V	
$V_{GS}$	Continuous	$\pm 20$	V	
$V_{GSM}$	Transient	$\pm 30$	V	
$I_{D25}$	$T_C = 25^{\circ}\text{C}$	24N100	24	A
		23N100	23	A
$I_{DM}$	$T_C = 25^{\circ}\text{C}$ ; Note 1	24N100	96	A
		23N100	92	A
$I_{AR}$	$T_C = 25^{\circ}\text{C}$		24	A
$E_{AR}$	$T_C = 25^{\circ}\text{C}$		60	mJ
$E_{AS}$	$T_C = 25^{\circ}\text{C}$		3	J
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100$ A/ $\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^{\circ}\text{C}$ , $R_G = 2 \Omega$		5	V/ns
$P_D$	$T_C = 25^{\circ}\text{C}$		600	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 (0.063 in) from case for 10 s		300	$^{\circ}\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ min $I_{ISOL} \leq 1$ mA $t = 1$ s		2500	V~
			3000	V~
$M_d$	Mounting torque Terminal connection torque		1.5/13 Nm/lb.in.	
			1.5/13 Nm/lb.in.	
<b>Weight</b>			30	g

miniBLOC, SOT-227 B (IXFN)  
E153432



G = Gate  
S = Source  
D = Drain

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

### Features

- International standard package
- Encapsulating epoxy meets UL 94 V-0, flammability classification
- miniBLOC with Aluminium nitride isolation
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

### Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

### 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.
$V_{DSS}$	$V_{GS} = 0$ V, $I_D = 3$ mA	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8$ mA	3.0		5.0 V
$I_{GSS}$	$V_{GS} = \pm 20$ V, $V_{DS} = 0$ V			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0$ V	$T_J = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$		100 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 I_{D25}$ Note 2	23N100 24N100		0.43 $\Omega$ 0.39 $\Omega$

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 \dot{I}_{D25}$ , Note 2	15	22	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		7000	pF
$C_{oss}$			750	pF
$C_{rss}$			260	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \dot{I}_{V_{DSS}}, I_D = 0.5 \dot{I}_{D25}$ $R_G = 1\ \Omega$ (External),		35	ns
$t_r$			35	ns
$t_{d(off)}$			75	ns
$t_f$			21	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \dot{I}_{V_{DSS}}, I_D = 0.5 \dot{I}_{D25}$		250	nC
$Q_{gs}$			55	nC
$Q_{gd}$			135	nC
$R_{thJC}$			0.21	K/W
$R_{thCK}$		0.05		K/W

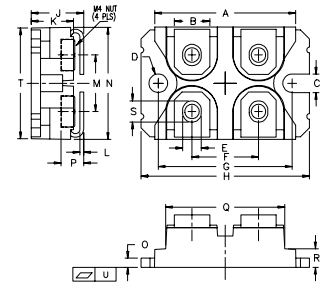
### Source-Drain Diode

( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			
		Min.	Typ.	Max.	
$I_S$	$V_{GS} = 0$	24N100 23N100		24 23	A A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$	24N100 23N100		96 92	A 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
$t_{rr}$	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		1.0	250	ns
$Q_{RM}$			8		$\mu\text{C}$
$I_{RM}$					A

- Notes: 1. Pulse width limited by  $T_{JM}$ .  
2. Pulse test,  $t \leq 300\text{ ms}$ , 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
	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

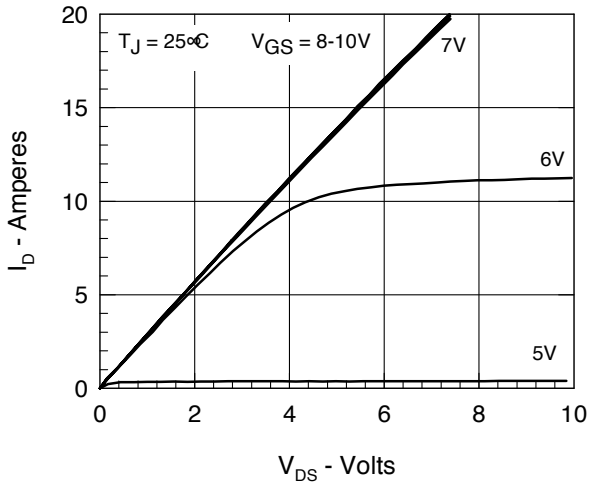


Figure 1. Output Characteristics at 25°C

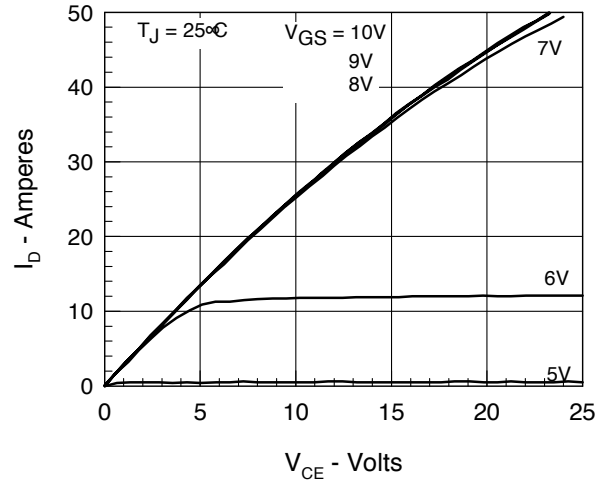


Figure 2. Extended Output Characteristics at 125°C

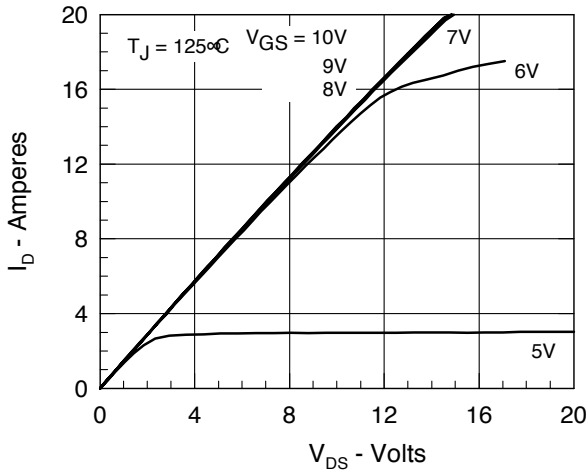


Figure 3.  $R_{DS(on)}$  normalized to 0.5  $I_{D25}$  value vs.  $I_D$

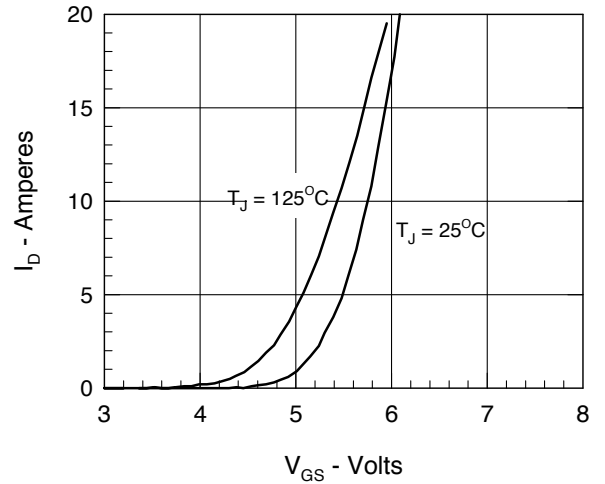


Figure 4. Admittance Curves

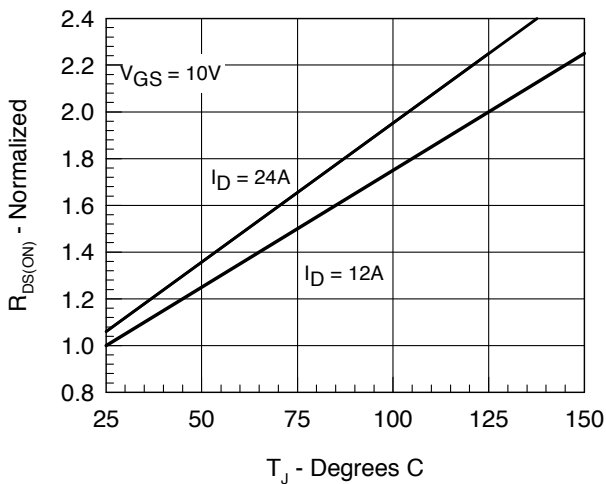


Figure 5.  $R_{DS(on)}$  normalized to 0.5  $I_{D25}$  value vs.  $T_J$

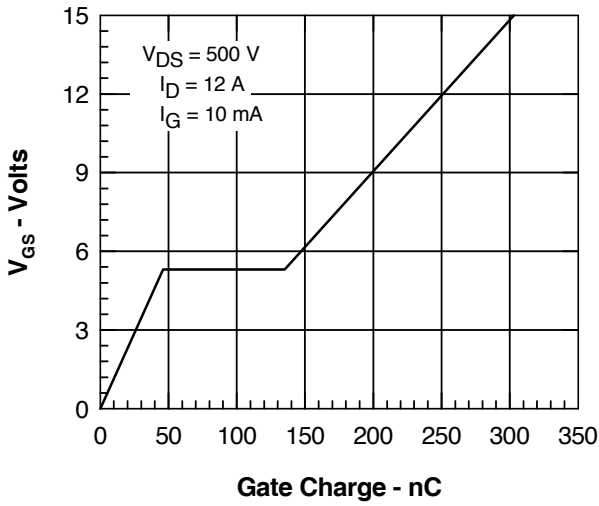


Figure 6. Gate Charge

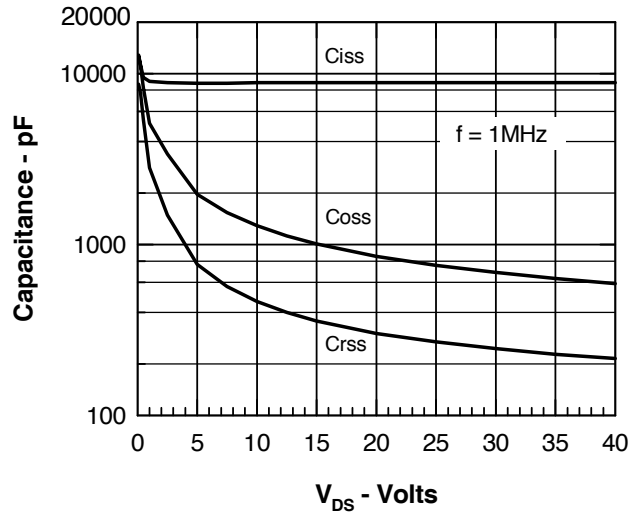


Figure 7. Capacitance Curves

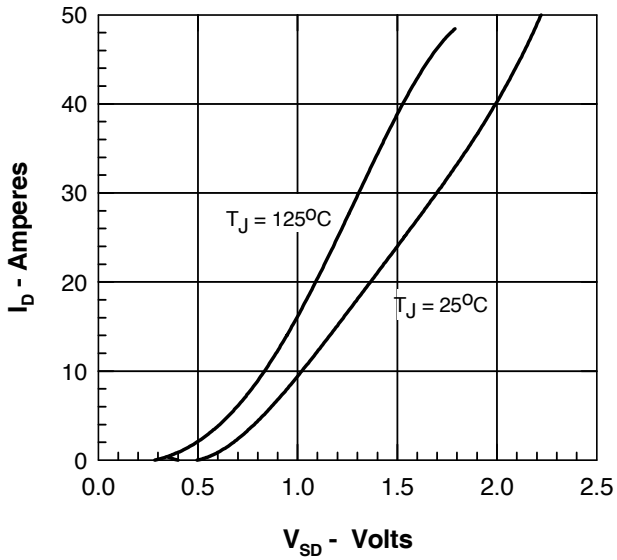


Figure 8. Forward Voltage Drop of the Intrinsic Diode

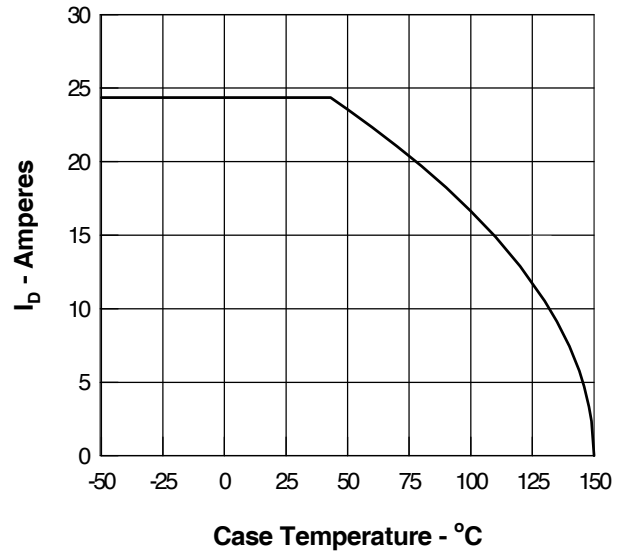


Figure 9. Drain Current vs. Case Temperature

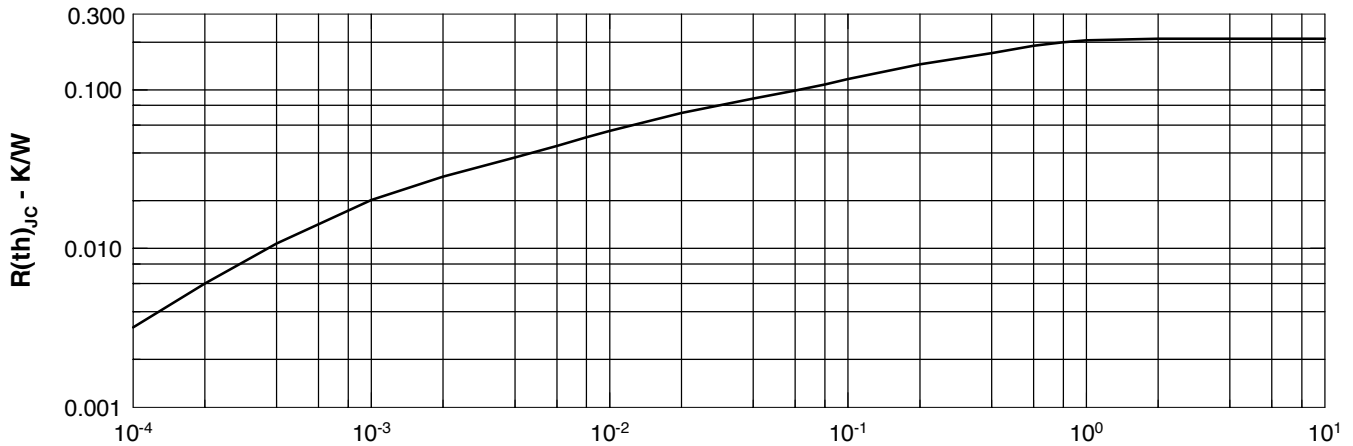


Figure 10. Transient Thermal Resistance



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