



HiPerFET™ Power MOSFET

Single MOSFET Die

IXFN 120N20
IXFN 110N20
IXFK 120N20
IXFK 110N20

V_{DSS}	I_{D25}	$R_{DS(on)}$
200 V	120 A	17 mΩ
200 V	110 A	20 mΩ
200 V	120 A	17 mΩ
200 V	110 A	20 mΩ

$t_{rr} \leq 200$ ns

Symbol	Test Conditions	Maximum Ratings			
		IXFK 110	IXFK 120	IXFN 110	IXFN 120
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	200		200	V
V_{DGR} ①	$T_J = 25^\circ\text{C}$ to 150°C	200		200	V
V_{GS}	Continuous	± 20		± 20	V
V_{GSM}	Transient	± 30		± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	110	120	110	120
I_{DM} ②	$T_C = 25^\circ\text{C}$	440	480	440	480
I_{AR}	$T_C = 25^\circ\text{C}$	110	120	110	120
E_{AR}	$T_C = 25^\circ\text{C}$	60		60	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μs , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	5		5	V/ns
P_D	$T_C = 25^\circ\text{C}$	560		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	0.9/6		1.5/13	Nm/lb.in.
	Terminal connection torque	-		1.5/13	Nm/lb.in.
Weight		10		30	g

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 3$ mA V_{DSS} temperature coefficient	200	0.078	V %/K
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8$ mA $V_{GS(th)}$ temperature coefficient	2	-0.187	V %/K
I_{GSS}	$V_{GS} = \pm 20$ V, $V_{GE} = 0$			± 200 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ V $V_{GS} = 0$ V	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		400 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300$ ms, duty cycle $d \leq 2\%$	120N20 110N20		17 mΩ 20 mΩ

Notes: 1. $R_{GS} = 1$ MΩ
2. Pulse width limited by T_{JM} .

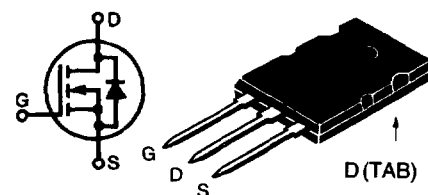
IXYS reserves the right to change any test conditions and dimensions.

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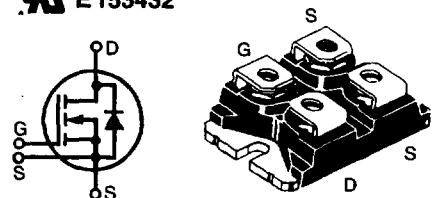
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TO-264 AA (IXFK)



miniBLOC, SOT-227 B (IXFN)

E 153432



G = Gate
S = Source
D = Drain
TAB = Drain
Either Source terminal at miniBLOC can be used as Main or Kelvin Source

Features

- International standard packages
- 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

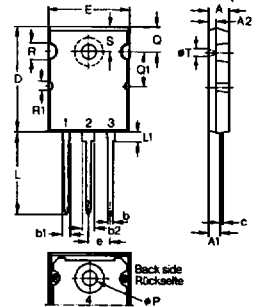
- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

Advantages

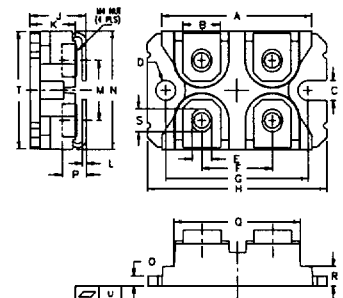
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test		65	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		10300	pF
C_{oss}			2200	pF
C_{rss}			1200	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External)		40	ns
t_r			90	ns
$t_{d(off)}$			158	ns
t_f			79	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		515	nC
Q_{gs}			62	nC
Q_{gd}			276	nC
R_{thJC}	TO-264 AA		0.22	K/W
R_{thCK}	TO-264 AA		0.15	K/W
R_{thJC}	miniBLOC, SOT-227 B		0.21	K/W
R_{thCK}	miniBLOC, SOT-227 B		0.05	K/W

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
I_s	$V_{GS} = 0\text{ V}$	110N20 120N20		110 120	A A
I_{SM}	Repetitive; pulse width limited by T_{JM}	110N20 120N20		440 480	A A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5	V
t_{rr}	$I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		175	ns	
Q_{RM}			1.1	μC	
I_{RM}			12.6	A	

TO-264 AA Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC .215 BSC			
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
O	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

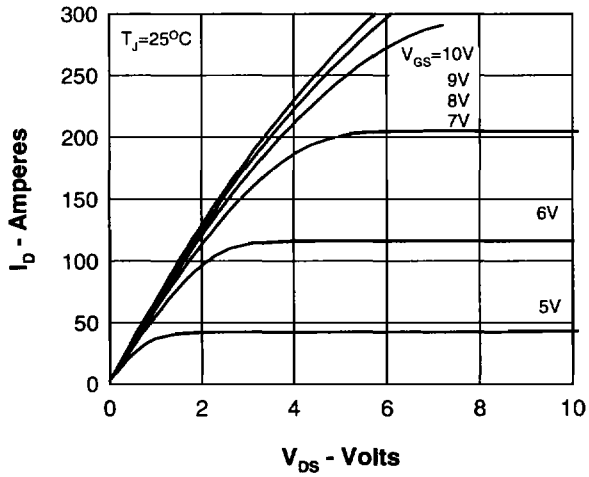


Figure 1. Output Characteristics at 25°C

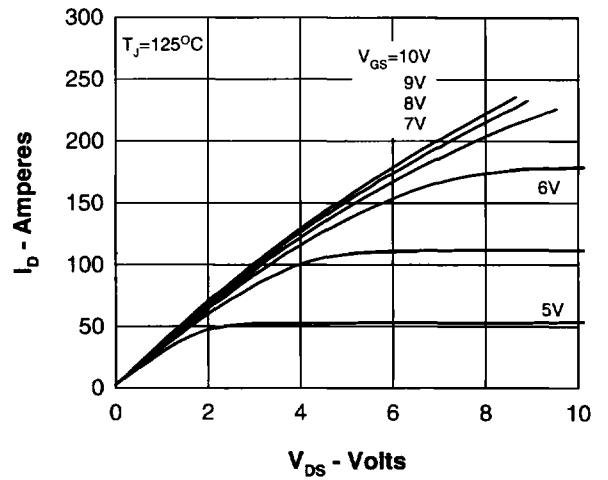


Figure 2. Output Characteristics at 125°C

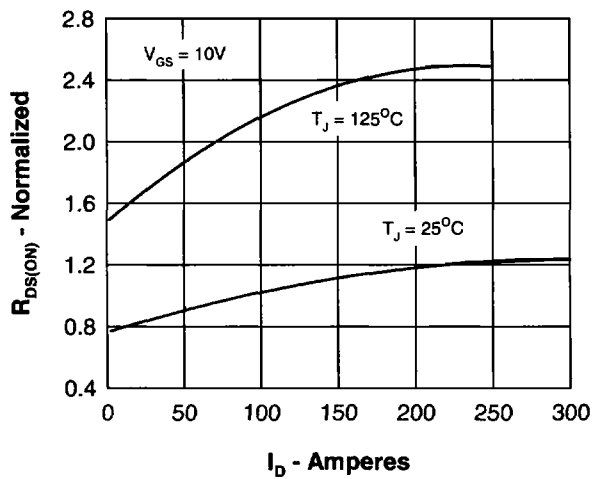


Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

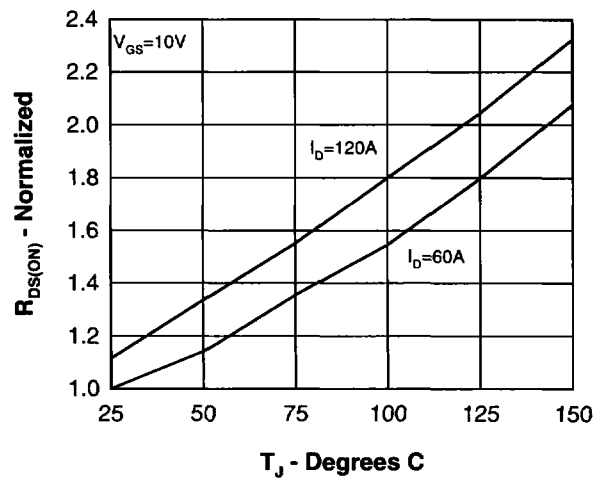


Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

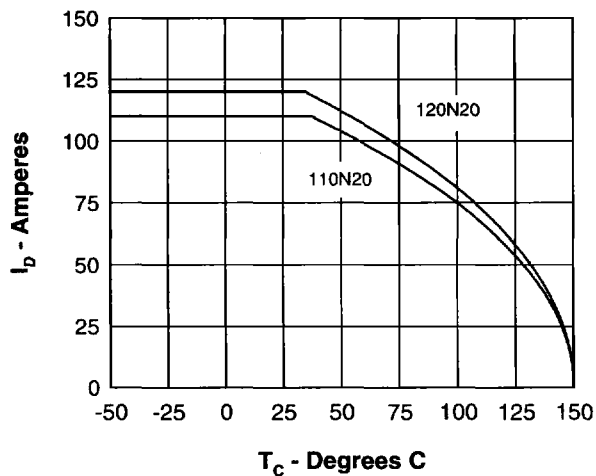


Figure 5. Drain Current vs. Case Temperature

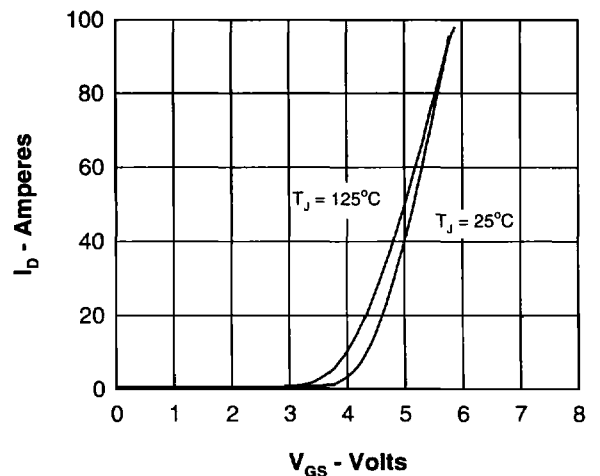


Figure 6. Admittance Curves

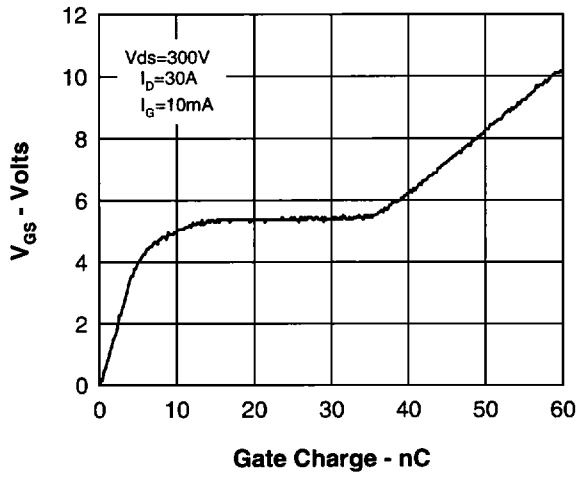


Figure 7. Gate Charge

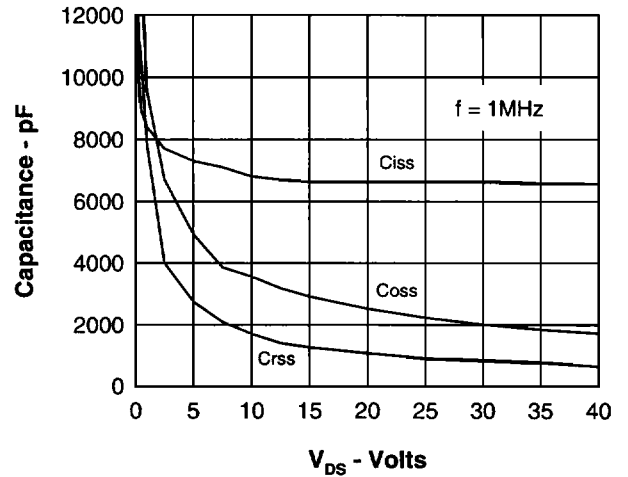


Figure 8. Capacitance Curves

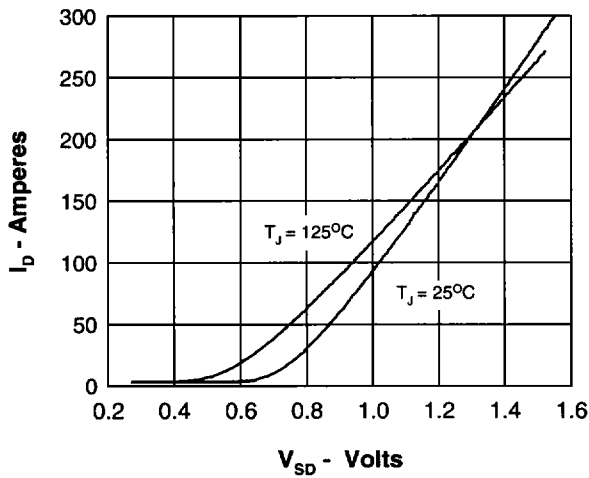


Figure 9. Forward Voltage Drop of the Intrinsic Diode

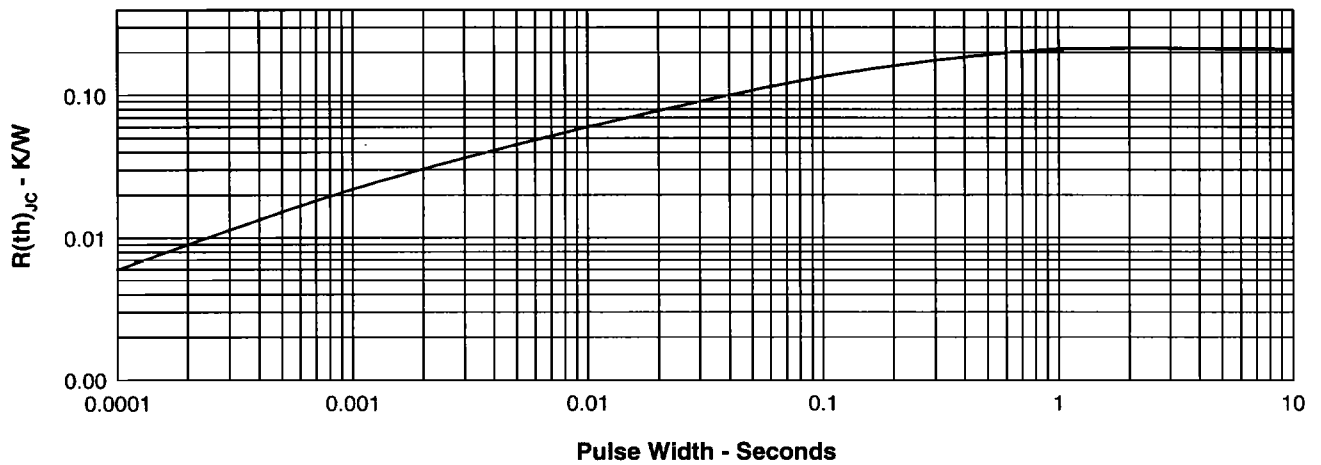
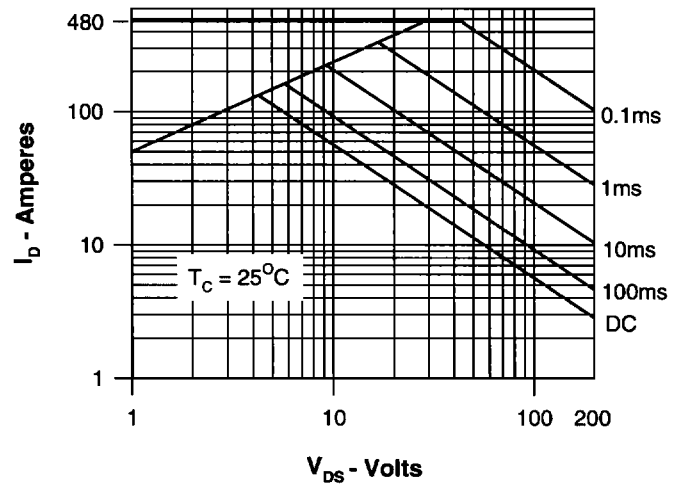


Figure 11. Transient Thermal Resistance