



**THE DATASHEET OF
IXFN106N20**



HiPerFET™ Power MOSFETs

IXFK 90 N 20
IXFN 100 N 20
IXFN 106 N 20

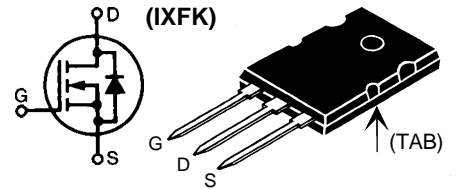
V_{DSS}	I_{D25}	$R_{DS(on)}$
200 V	90 A	23 mΩ
200 V	100 A	23 mΩ
200 V	106 A	20 mΩ

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

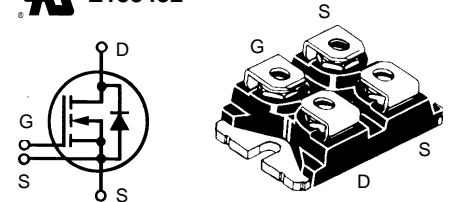
$t_{rr} \leq 200$ ns

Symbol	Test Conditions	Maximum Ratings		
		IXFK	IXFN	IXFN
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	90N20 200	100N20 200	106N20 200 V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ MΩ	200	200	200 V
V_{GS}	Continuous	±20	±20	20 V
V_{GSM}	Transient	±30	±30	20 V
I_{D25}	$T_C = 25^\circ\text{C}$, Chip capability	90 ①	100	106 A
I_{D80}	$T_C = 80^\circ\text{C}$, limited by external leads	76	-	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	360	400	424 A
I_{AR}	$T_C = 25^\circ\text{C}$	50	50	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	30	30 mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/μs, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω	5	5	5 V/ns
P_D	$T_C = 25^\circ\text{C}$	500	520	W
T_J		-55 ... +150 °C		
T_{JM}		150 °C		
T_{stg}		-55 ... +150 °C		
T_L	1.6 mm (0.063 in) from case for 10 s	300	-	°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

TO-264 AA



miniBLOC, SOT-227 B (IXFN)
E153432



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
- JEDEC TO-264 AA, epoxy meet UL94 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.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 1$ mA	200		V
$V_{GH(th)}$	$V_{DS} = V_{GS}$, $I_D = 8$ mA	2		V
I_{GSS}	$V_{GS} = \pm 20$ V _{DC} , $V_{DS} = 0$			±200 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0$ V, $T_J = 125^\circ\text{C}$			400 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300$ μs, duty cycle $d \leq 2$ %			IXFK90N20 0.023 Ω IXFN100N20 0.023 Ω IXFN106N20 0.020 Ω

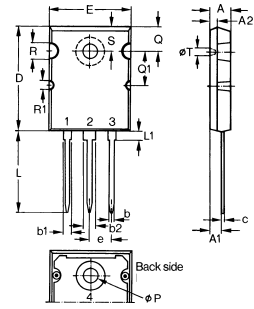
IXYS reserves the right to change limits, test conditions, and dimensions.

92804H (7/97)

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		60	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		9000	pF
C_{oss}			1600	pF
C_{rss}			590	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),		30	ns
t_r			80	ns
$t_{d(off)}$			75	ns
t_f			30	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		380	nC
Q_{gs}			70	nC
Q_{gd}			190	nC
R_{thJC}	TO-264 AA		0.25	K/W
R_{thCK}	TO-264 AA		0.15	K/W
R_{thJC}	miniBLOC, SOT-227 B		0.24	K/W
R_{thCK}	miniBLOC, SOT-227 B		0.05	K/W

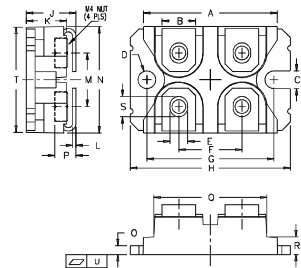
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			90 A IXFK90N20 IXFN100N20 IXFN106N20
I_{SM}	Repetitive; pulse width limited by T_{JM}			360 A IXFK90N20 IXFN100N20 424 A IXFN106N20
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		3	200 ns
Q_{RM}			38	μC
I_{RM}				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
Q	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

Fig. 1 Output Characteristics

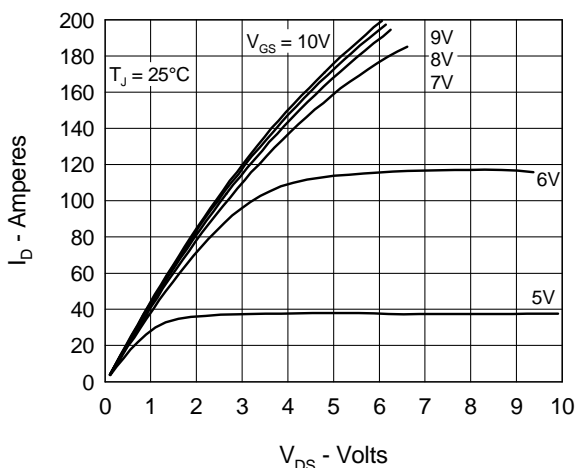


Fig. 2 Input Admittance

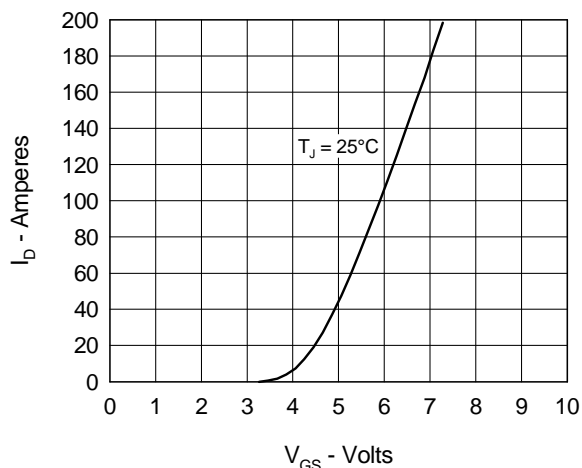
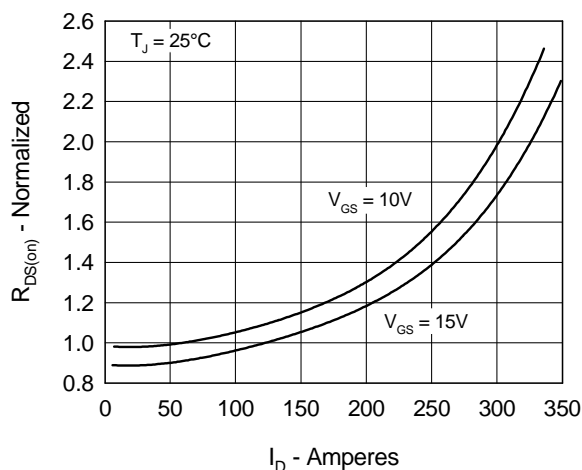

 Fig. 3 $R_{DS(on)}$ vs. Drain Current


Fig. 4 Temperature Dependence of Drain to Source Resistance

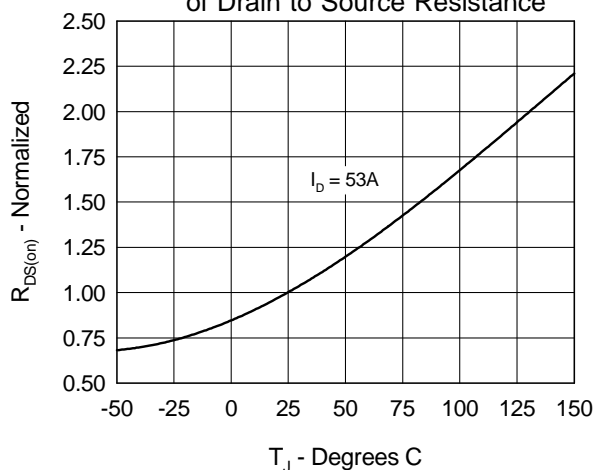


Fig. 5 Drain Current vs. Case Temperature

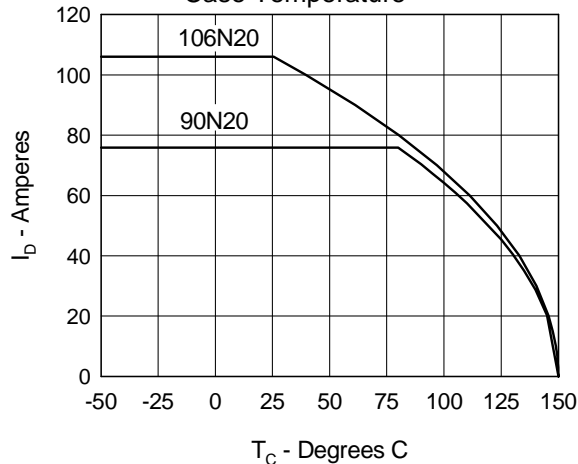


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

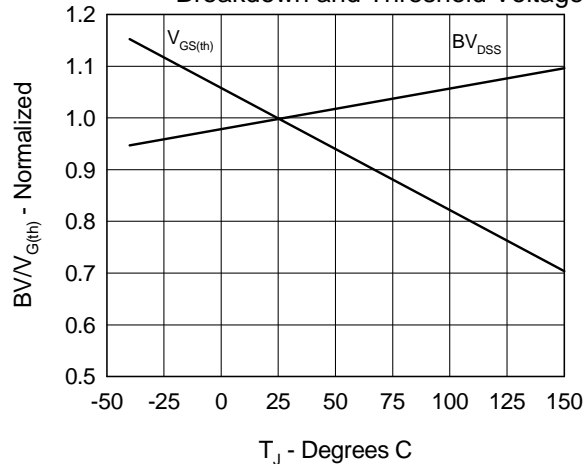


Fig.7 Gate Charge Characteristic Curve

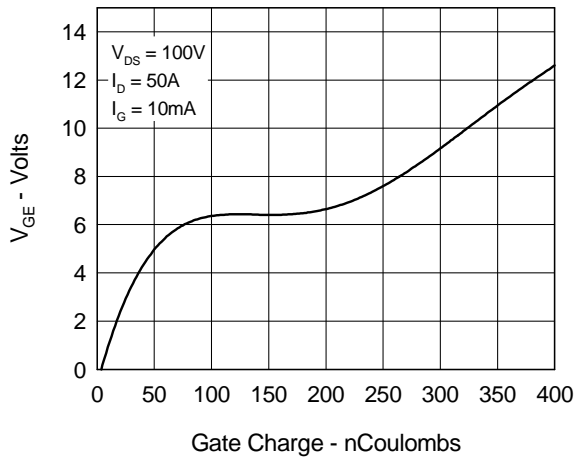


Fig.8 Capacitance Curves

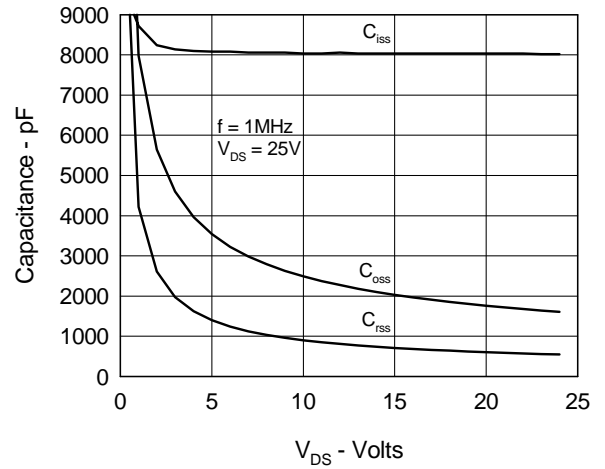


Fig.9 Source Current vs. Source to Drain Voltage

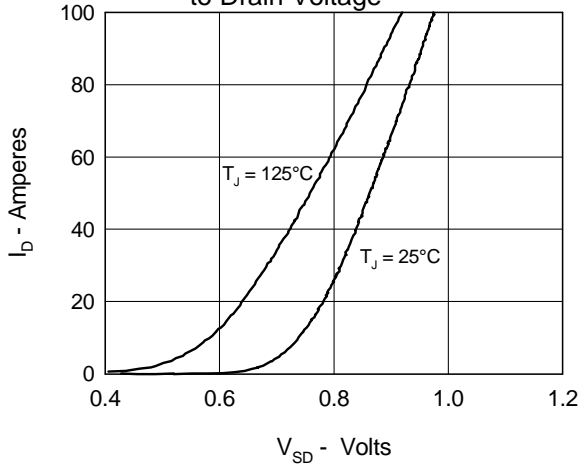
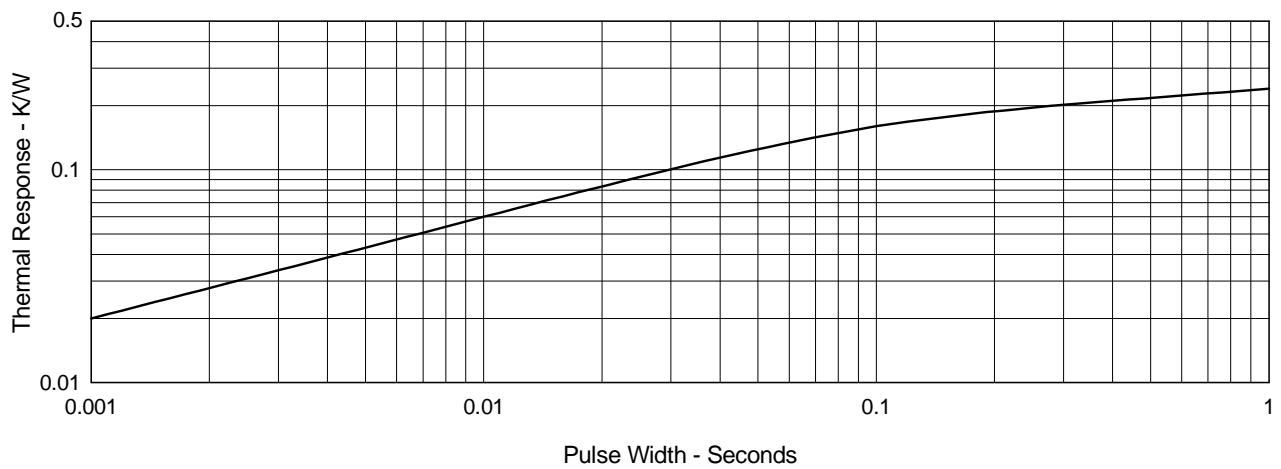


Fig.10 Transient Thermal Impedance







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