IXYS

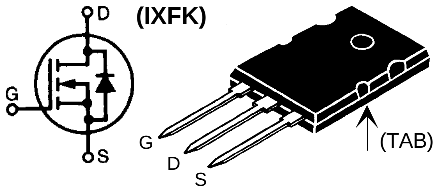
HiPerFET™ Power MOSFETs

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

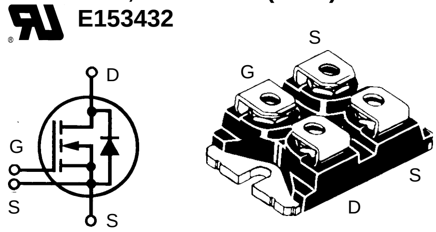
	V_{DSS}	I_{D25}	$R_{DS(on)}$
IXFK 90 N 20	**200 V**	**90 A**	**23 mΩ**
IXFN 100 N 20	**200 V**	**100 A**	**23 mΩ**
IXFN 106 N 20	**200 V**	**106 A**	**20 mΩ**

$t_{rr} \leq 200$ ns

TO-264 AA



miniBLOC, SOT-227 B (IXFN)
E153432



G = Gate D = Drain
S = Source TAB = Drain

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

Symbol	Test Conditions	Maximum Ratings IXFK 90N20	IXFN 100N20	IXFN 106N20
V_{DSS}	T_J = 25°C to 150°C	200	200	200 V
V_{DGR}	T_J = 25°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°C, Chip capability	90 ①	100	106 A
I_{D80}	T_C = 80°C, limited by external leads	76	-	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	360	400	424 A
I_{AR}	T_C = 25°C	50	50	A
E_{AR}	T_C = 25°C	30	30	30 mJ
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$, $T_J \leq$ 150°C, R_G = 2 Ω	5	5	5 V/ns
P_D	T_C = 25°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	-	2500	V~
	$I_{ISOL} \leq$ 1 mA t = 1 s	-	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°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		4	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±200	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}	T_J = 25°C			400	µA
	V_{GS} = 0 V	T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 • I_{D25}					
	Pulse test, t ≤ 300 µs,	IXFK90N20			0.023	Ω
	duty cycle d ≤ 2 %	IXFN100N20			0.023	Ω
		IXFN106N20			0.020	Ω

Features

- International standard packages
- JEDEC TO-264 AA, epoxy meet 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

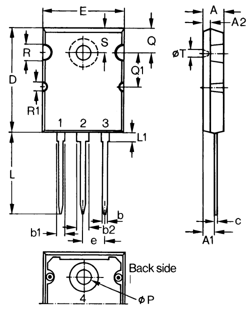
IXYS reserves the right to change limits, test conditions, and dimensions. 92804H (7/97)

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 • I_{D25}, pulse test		60		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		9000		pF
C_{oss}			1600		pF
C_{rss}			590		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 1 Ω (External),		30		ns
t_r			80		ns
$t_{d(off)}$			75		ns
t_f			30		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • 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

Source-Drain Diode

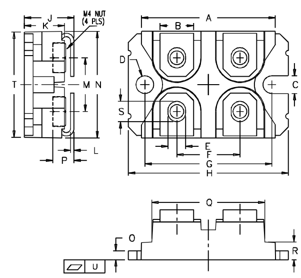
Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V	IXFK90N20 IXFN100N20 IXFN106N20			90 100 106	A A A
I_{SM}	Repetitive; pulse width limited by T_{JM}	IXFK90N20 IXFN100N20 IXFN106N20			 360 424	 A A
V_{SD}	I_F = 100 A, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %				1.5	V
t_{rr}	I_F = 50 A, -di/dt = 100 A/µs, V_R = 100 V				200	ns
Q_{RM}				3		µC
I_{RM}				38		A

TO-264 AA Outline



Dim.	Millimeter Min.	Max.	Inches 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 Min.	Max.	Inches 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 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

Fig. 1 Output Characteristics

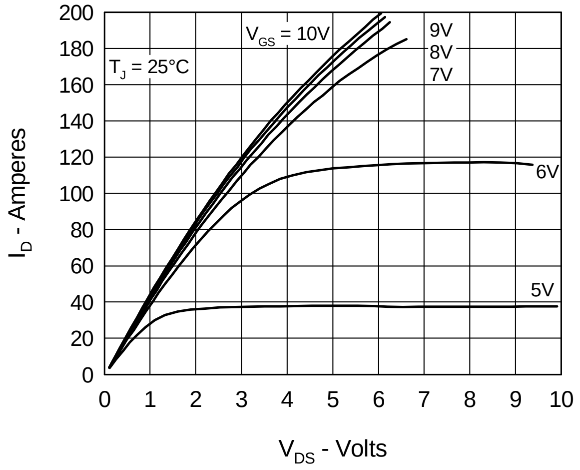


Fig. 2 Input Admittance

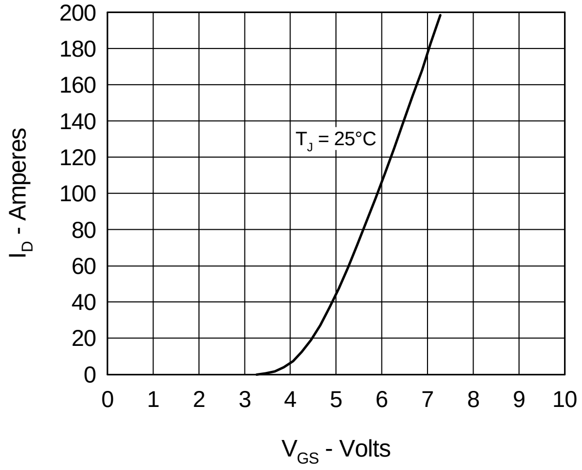


Fig. 3 $R_{DS(on)}$ vs. Drain Current

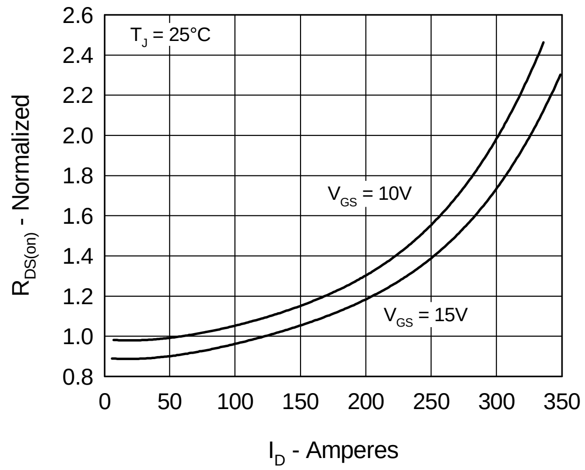


Fig. 4 Temperature Dependence of Drain to Source Resistance

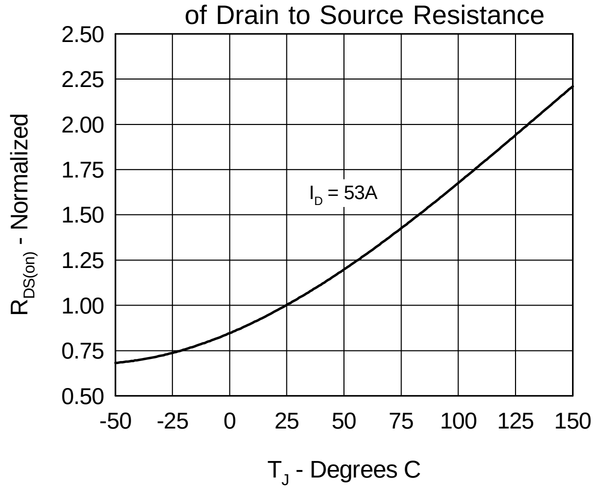


Fig. 5 Drain Current vs. Case Temperature

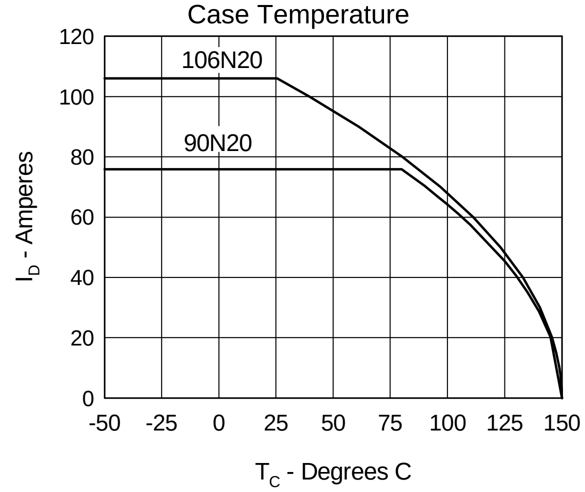


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

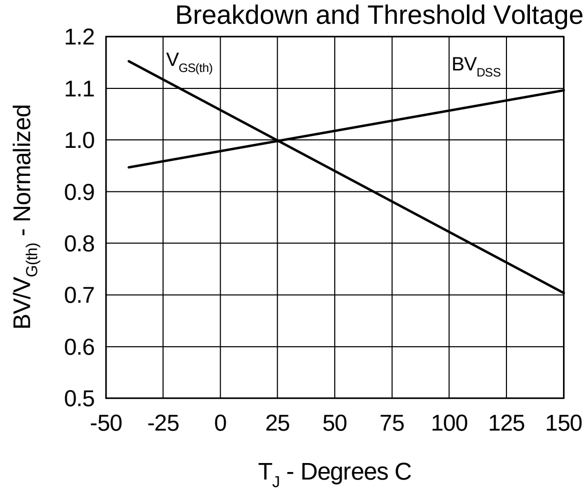


Fig.7 Gate Charge Characteristic Curve

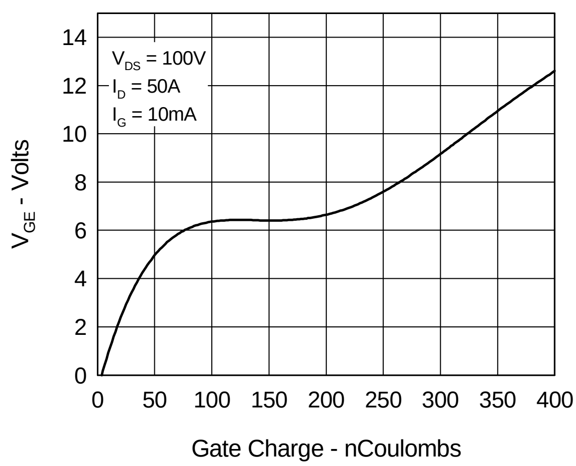


Fig.8 Capacitance Curves

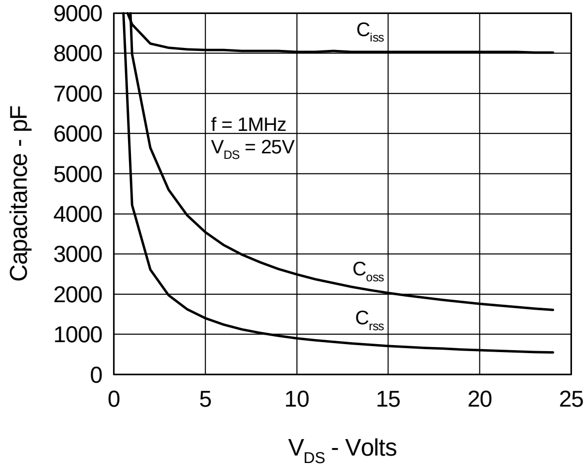


Fig.9 Source Current vs. Source to Drain Voltage

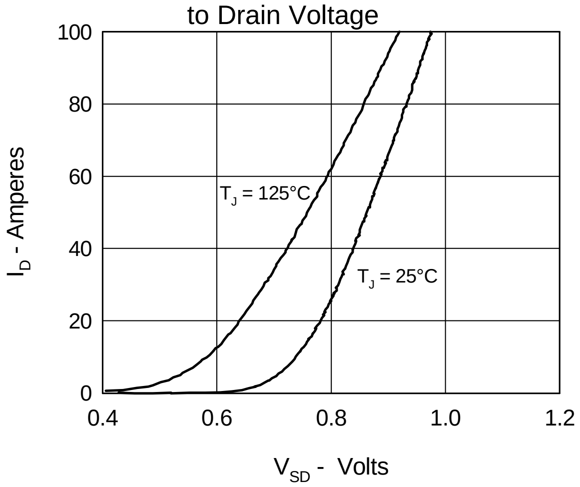


Fig.10 Transient Thermal Impedance