IXYS

HiPerFET™ Power MOSFET

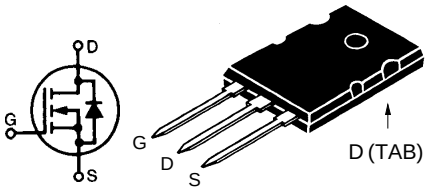
IXFN170N10
IXFK170N10

V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
100V	170A	10mΩ	200ns
100V	170A	10mΩ	200ns

Single MOSFET Die

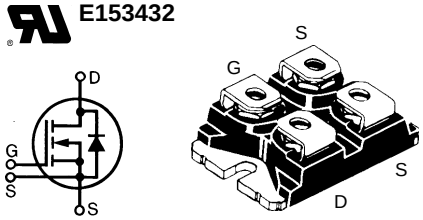
Preliminary data

TO-264 AA (IXFK)



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 170N10	IXFN 170N10	
V_{DSS}	T_J = 25°C to 150°C	100	100	V
V_{DGR} ①	T_J = 25°C to 150°C	100	100	V
V_{GS}	Continuous	±20	±20	V
V_{GSM}	Transient	±30	±30	V
I_{D25}	T_C = 25°C	170③	170	A
I_{D125} ④	T_C = 125°C	76	NA	
I_{DM} ②	T_C = 25°C	680	680	A
I_{AR}	T_C = 25°C	170	170	A
E_{AR}	T_C = 25°C	60	60	mJ
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$ $T_J \le$ 150°C, R_G = 2 Ω	5	5	V/ns
P_D	T_C = 25°C	560	600	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	N/A	°C
V_{ISOL}	50/60 Hz, RMS t = 1 min	N/A	2500	V~
	$I_{ISOL} \le$ 1 mA t = 1 s	N/A	3000	V~
M_d	Mounting torque	0.9/6	1.5/13	Nm/lb.in.
	Terminal connection torque	N/A	1.5/13	Nm/lb.in.
Weight		10	30	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
V_{DSS}	V_{GS}= 0 V, I_D = 3mA	100			V
	V_{DSS} temperature coefficient		0.077		%/K
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA	2		4	V
	$V_{GS(th)}$ temperature coefficient		-0.183		%/K
I_{GSS}	V_{GS}= ±20V, V_{GS} = 0V			±200	nA
I_{DSS}	V_{DS}= 0.8 • V_{DSS} V, 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 ms, duty cycle d ≤ 2 %			10	mΩ

Features
- International standard packages
- Encapsulating epoxy meets UL94V-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.

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Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 • I_{D25}, pulse test		65		S
C_{iss}			10,300		pF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2,200		pF
C_{rss}			1,200		pF
$t_{d(on)}$			40		ns
t_r	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		90		ns
$t_{d(off)}$	R_G = 1 Ω (External),		158		ns
t_f			79		ns
$Q_{g(on)}$			515		nC
Q_{gs}	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		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

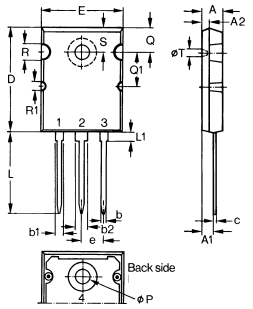
Source-Drain Diode

(T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0			170	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			680	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		175		ns
Q_{RM}			1.1		µC
I_{RM}			12.6		A

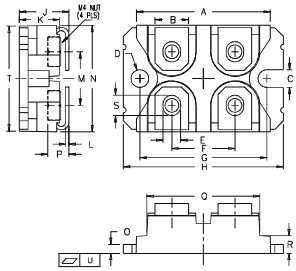
Notes:
1. R_{GS} = 1 MΩ
2. Pulse width limited by T_{JM}.
3. Chip capability
4. Current limited by external leads

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

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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

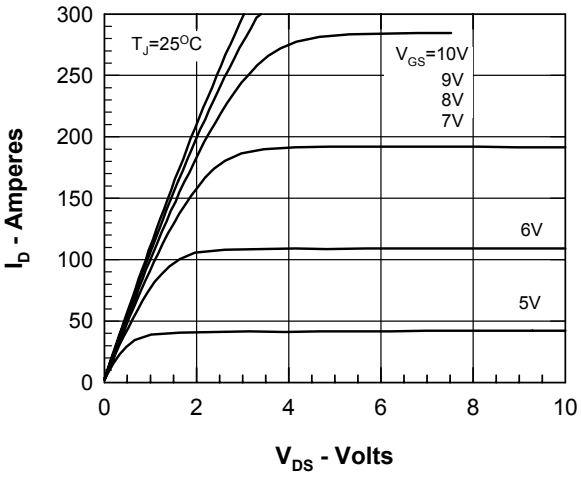

Figure 2. Output Characteristics at 125°C

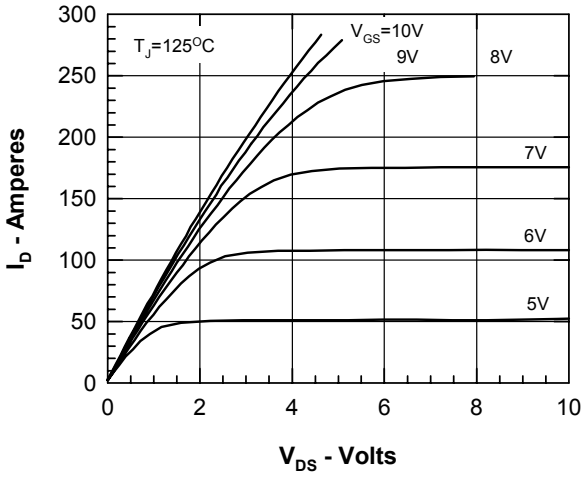

Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

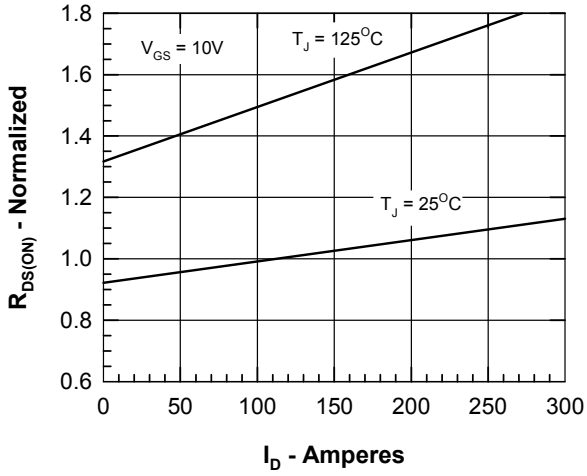

Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

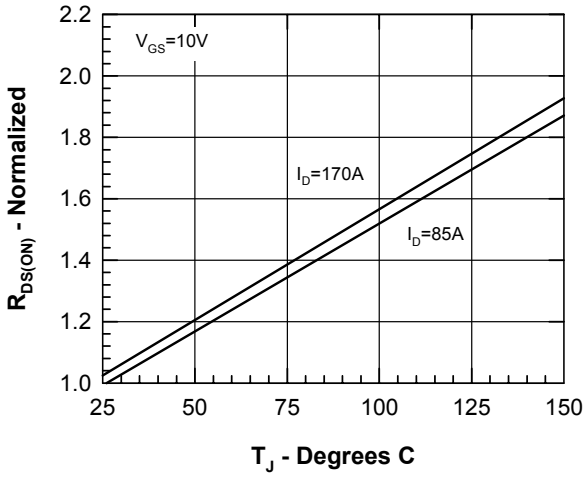

Figure 5. Drain Current vs. Case Temperature

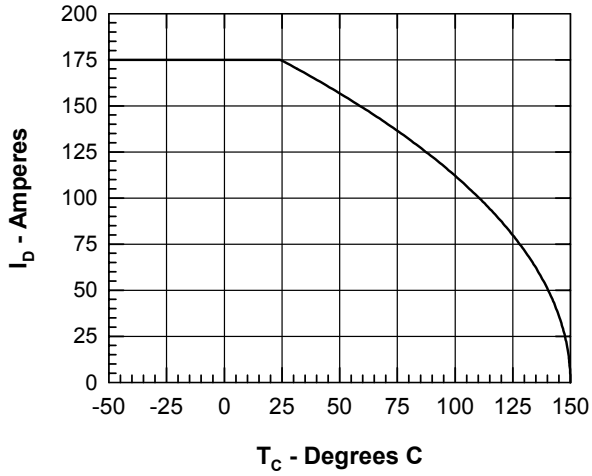

Figure 6. Admittance Curves

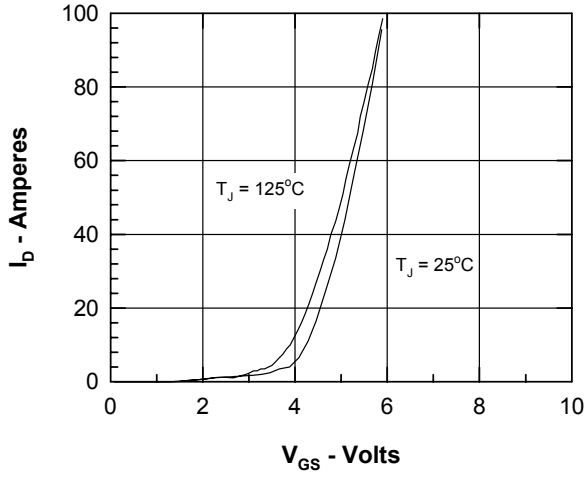

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Figure 7. Gate Charge

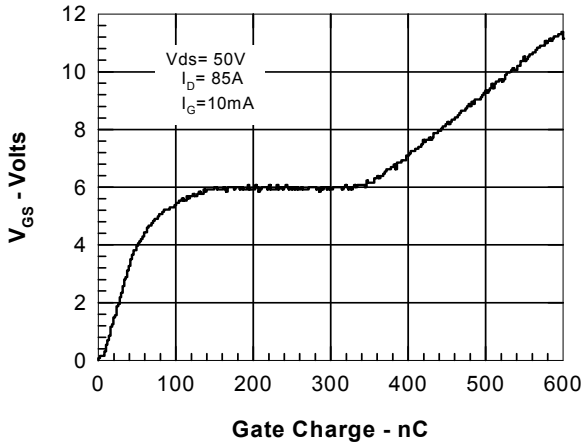


Figure 8. Capacitance Curves

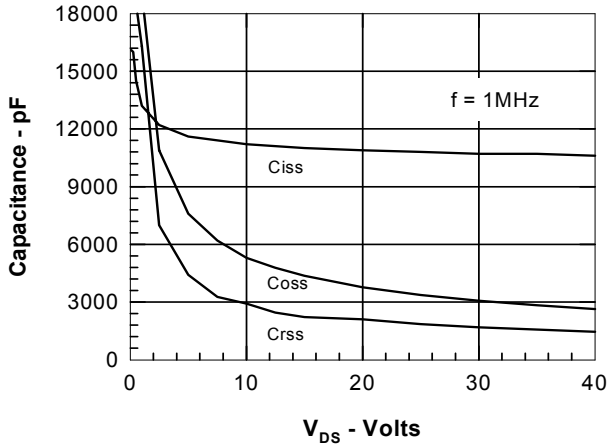


Figure 9. Forward Voltage Drop of the Intrinsic Diode

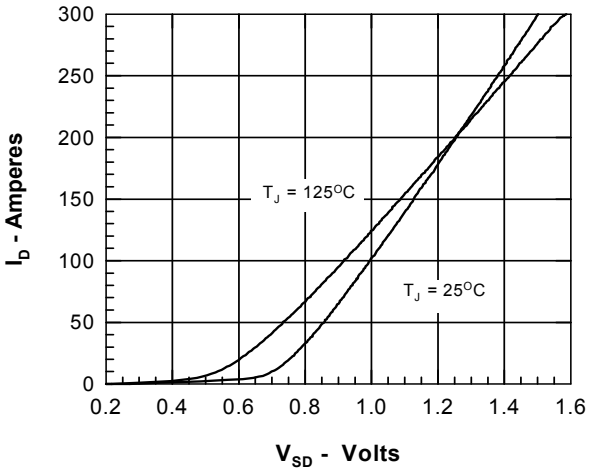


Figure10. Forward Bias Safe Operating Area

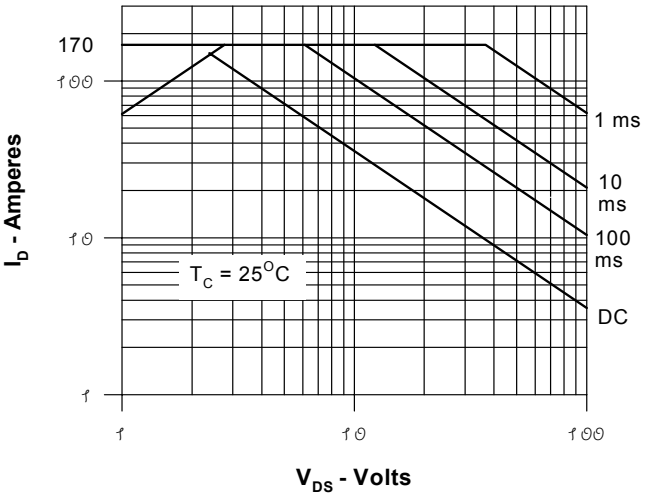
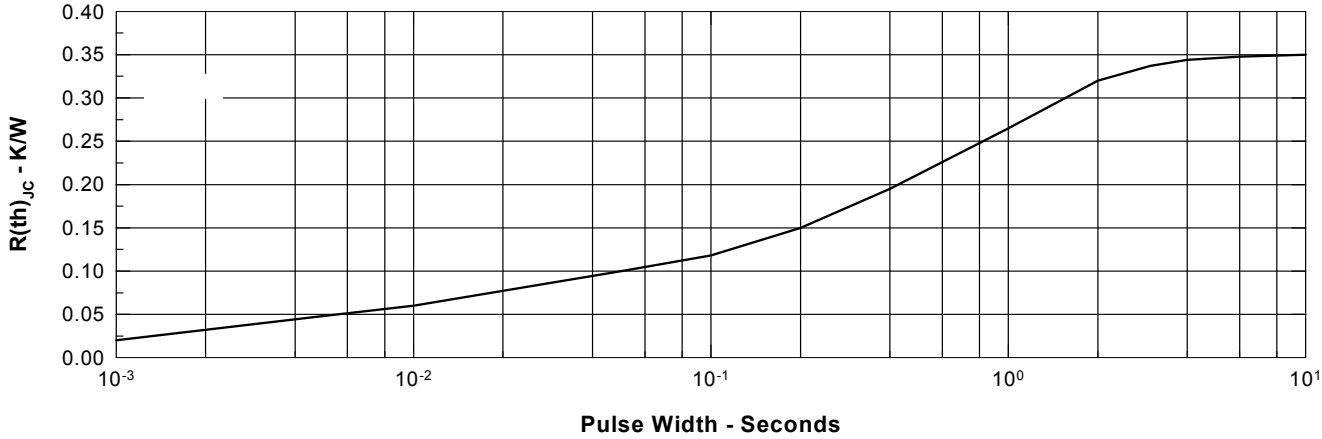


Figure 11. Transient Thermal Resistance



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