IXYS

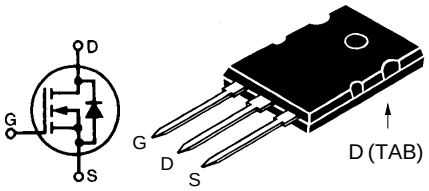
HiPerFET™ Power MOSFET

Single MOSFET Die

Preliminary data

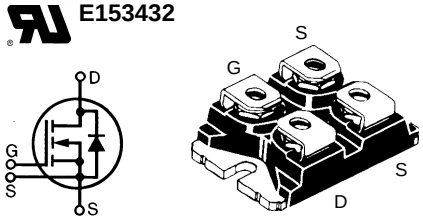
V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
IXFN170N10 100V	170A	10mΩ	200ns
IXFK170N10 100V	170A	10mΩ	200ns

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

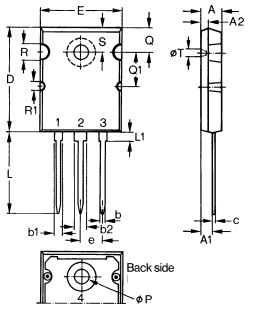
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 • I_{D25}, pulse test		65		S
C_{iss}			10,300		pF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2,200		pF
C_{rss}			1,200		pF
$t_{d(on)}$			40		ns
t_r	V_{GS} = 10 V,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

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	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}			175		ns
Q_{RM}	I_F = 50 A, -di/dt = 100 A/μs, V_R = 100 V		1.1		μC
I_{RM}			12.6		A

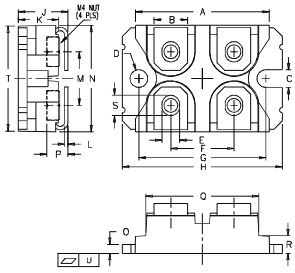
Notes:
1. R_{GS} = 1 MΩ
2. Pulse width limited by T_{JM}.
3. Chip capability
4. Current limited by external leads

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

Figure 1. Output Characteristics at 25°C

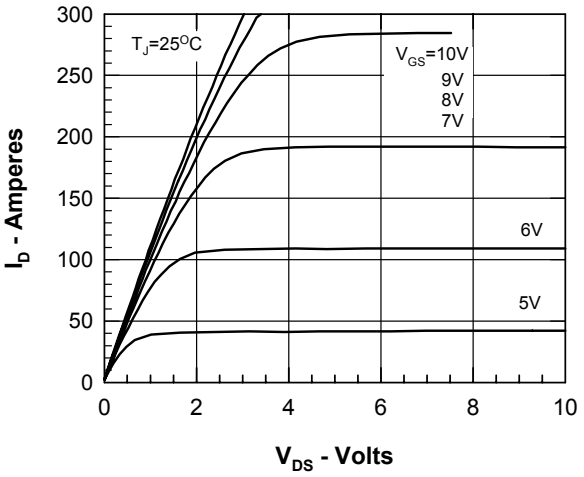


Figure 2. Output Characteristics at 125°C

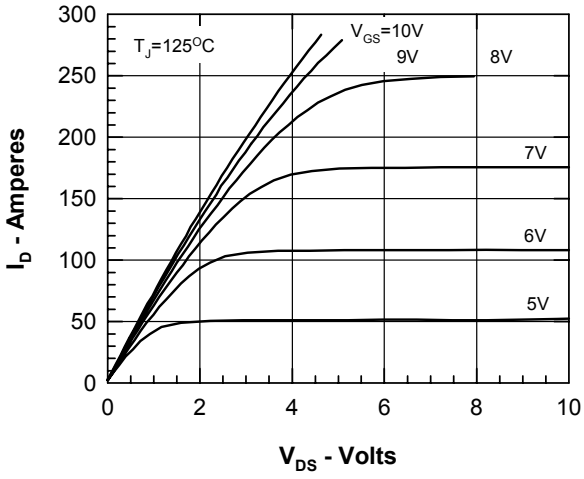


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

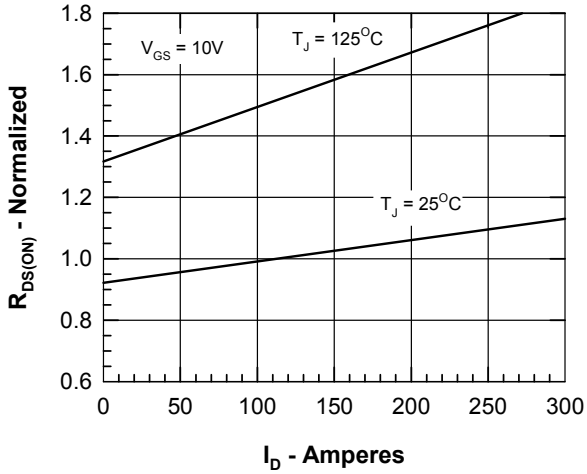


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

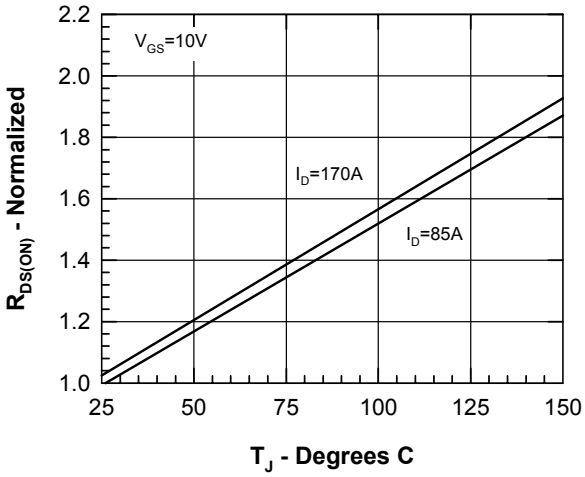


Figure 5. Drain Current vs. Case Temperature

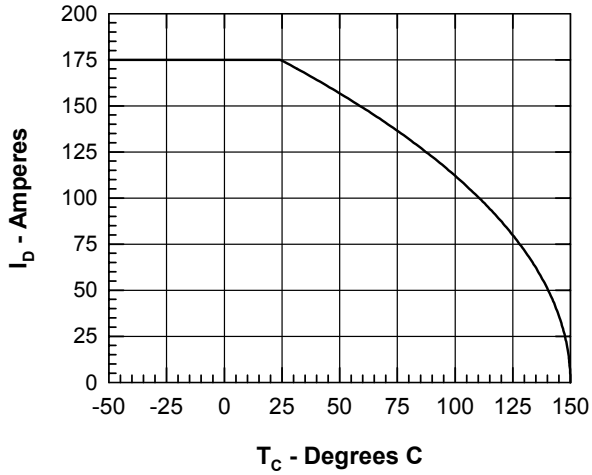


Figure 6. Admittance Curves

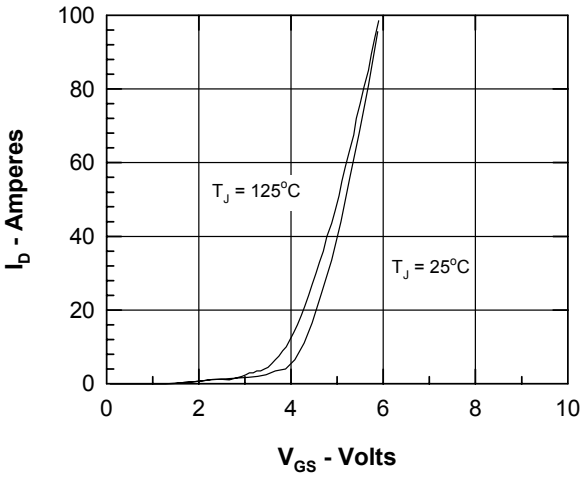


Figure 7. Gate Charge

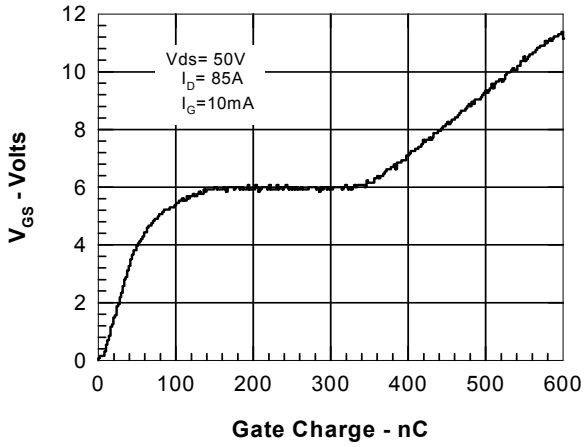


Figure 8. Capacitance Curves

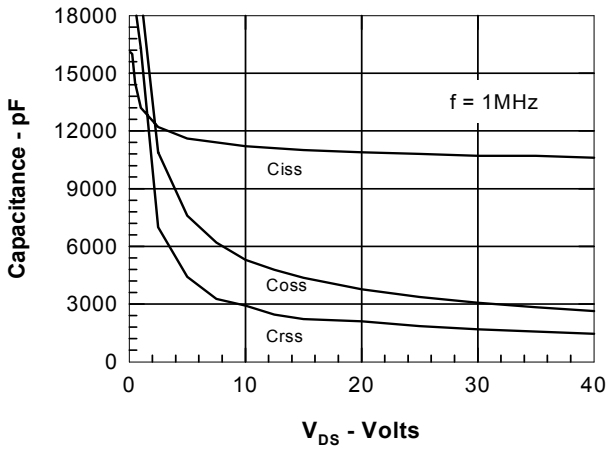


Figure 9. Forward Voltage Drop of the Intrinsic Diode

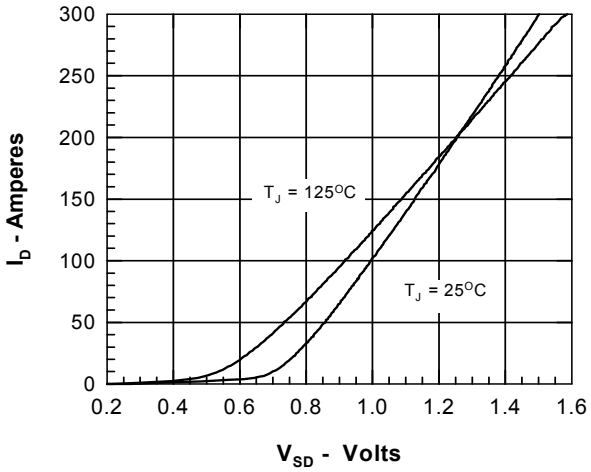


Figure10. Forward Bias Safe Operating Area

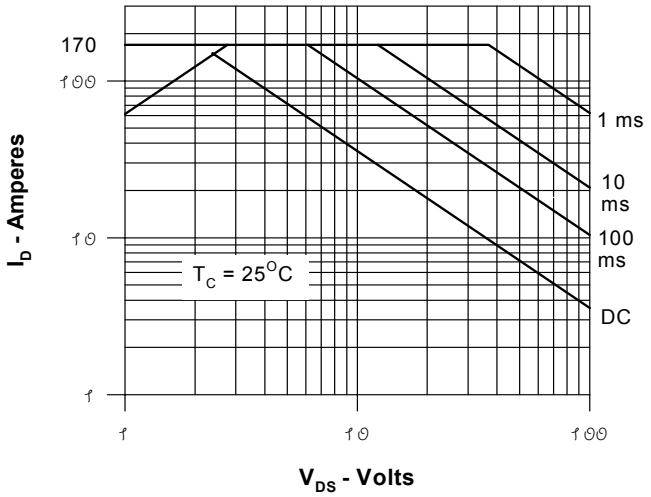


Figure 11. Transient Thermal Resistance