

HiPerFET™ Power MOSFET

Single MOSFET Die

Preliminary data

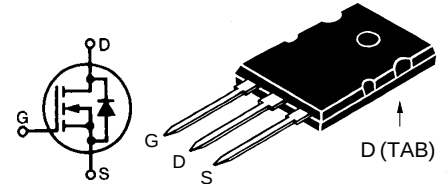
IXFN170N10
IXFK170N10

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

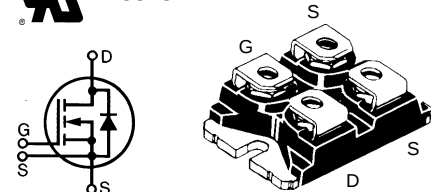
Symbol	Test Conditions	Maximum Ratings	
		IXFK 170N10	IXFN 170N10
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	100	100
$V_{DGR} \text{ ①}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	100	100
V_{GS}	Continuous	±20	±20
V_{GSM}	Transient	±30	±30
I_{D25}	$T_C = 25^\circ\text{C}$	170③	170
$I_{D125} \text{ ④}$	$T_C = 125^\circ\text{C}$	76	NA
$I_{DM} \text{ ②}$	$T_C = 25^\circ\text{C}$	680	680
I_{AR}	$T_C = 25^\circ\text{C}$	170	170
E_{AR}	$T_C = 25^\circ\text{C}$	60	60
dv/dt	$I_S \leq I_{DM}, di/dt \leq 100 \text{ A}/\mu\text{s}, V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}, R_G = 2 \Omega$	5	5
P_D	$T_C = 25^\circ\text{C}$	560	600
T_J		-55 ... +150°C	
T_{JM}		150	
T_{stg}		-55 ... +150°C	
T_L	1.6 mm (0.063 in) from case for 10 s	300	N/A
V_{ISOL}	50/60 Hz, RMS $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	N/A	2500 3000
M_d	Mounting torque Terminal connection torque	0.9/6 N/A	1.5/13 Nm/lb.in. 1.5/13 Nm/lb.in.
Weight		10	30

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0 \text{ V}, I_D = 3 \text{ mA}$ V_{DSS} temperature coefficient	100	0.077	V %/K
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 8 \text{ mA}$ $V_{GS(th)}$ temperature coefficient	2	-0.183	V %/K
I_{GSS}	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$			±200 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 \text{ V}$			400 2 μA mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \text{ ms}$, duty cycle $d \leq 2 \%$			10 mΩ

TO-264 AA (IXFK)



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
- Encapsulating epoxy meets 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**
($T_J = 25^\circ\text{C}$, unless otherwise specified)

Characteristic Values
Min. **Typ.** **Max.**

g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test	65	S
C_{iss}		10,300	pF
C_{oss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	2,200	pF
C_{rss}		1,200	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

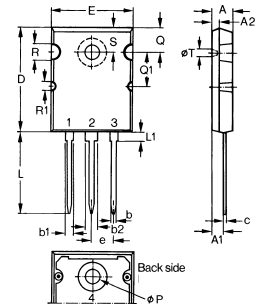
Source-Drain Diode
($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Test Conditions	Min.	Typ.	Max.
I_S	$V_{GS} = 0$			170 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			680 A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V},$ 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

Notes:

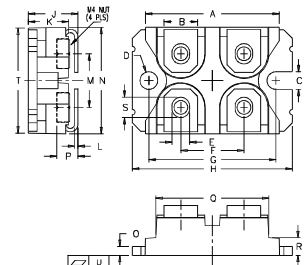
1. $R_{GS} = 1\text{ M}\Omega$
2. Pulse width limited by T_{JM} .
3. Chip capability
4. Current limited by external leads

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

Figure 1. Output Characteristics at 25°C

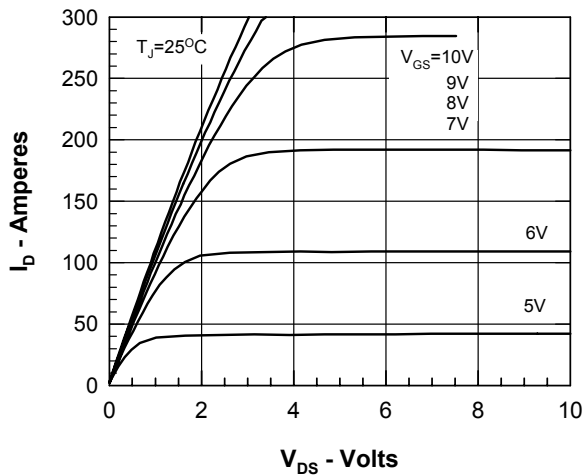


Figure 2. Output Characteristics at 125°C

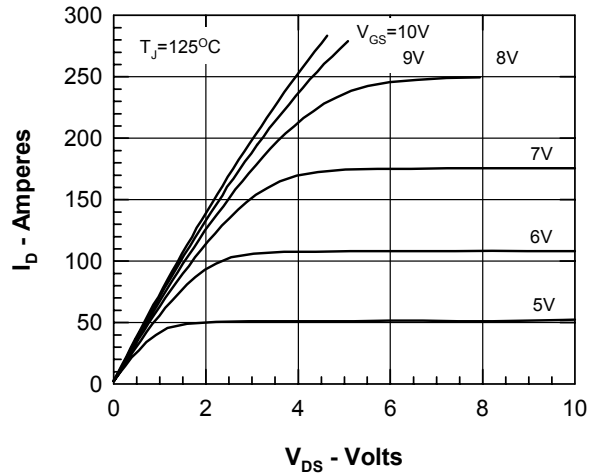
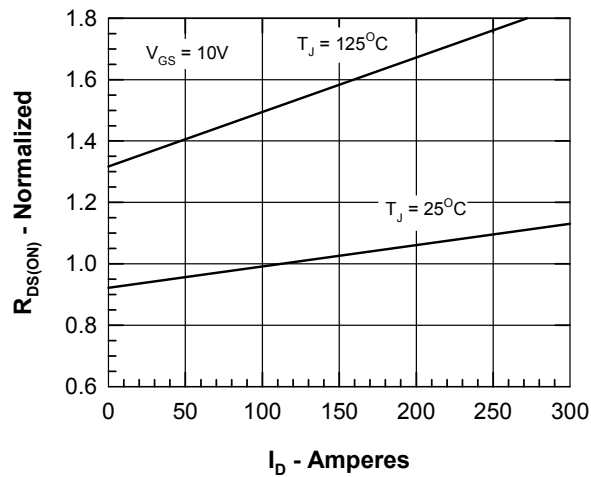
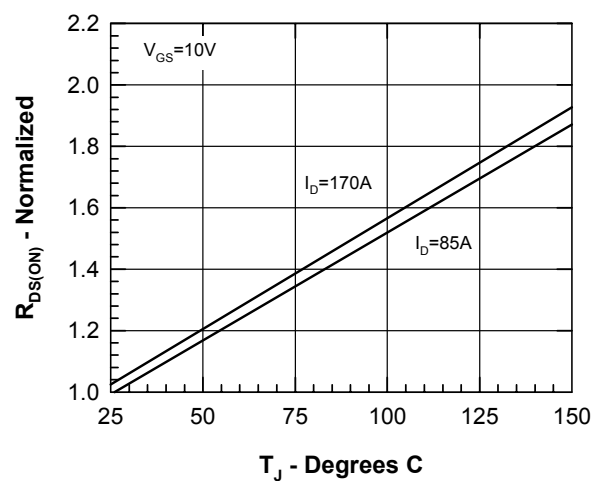

Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

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


Figure 5. Drain Current vs. Case Temperature

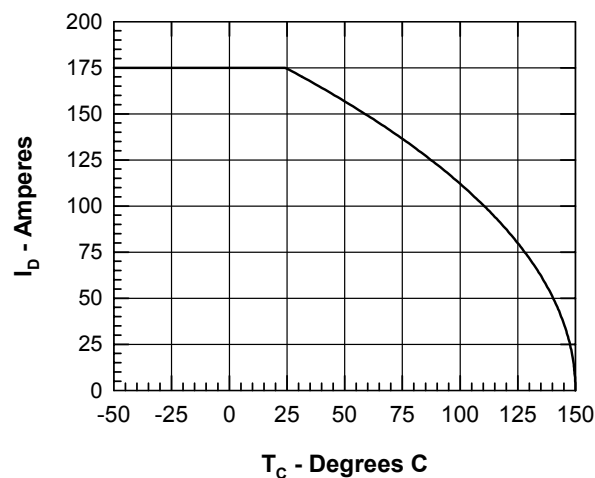


Figure 6. Admittance Curves

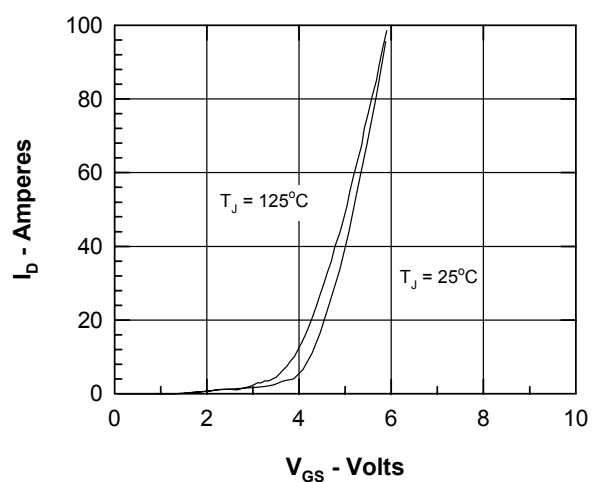


Figure 7. Gate Charge

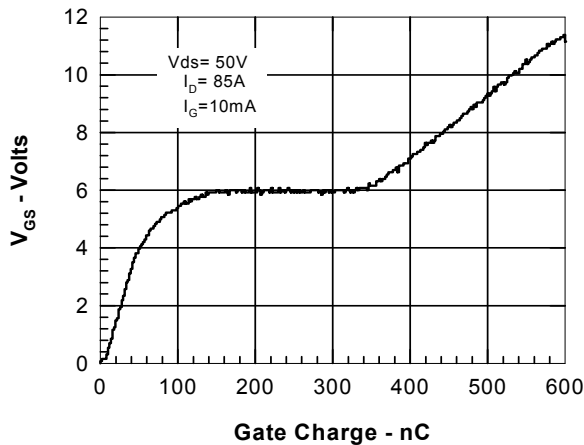


Figure 8. Capacitance Curves

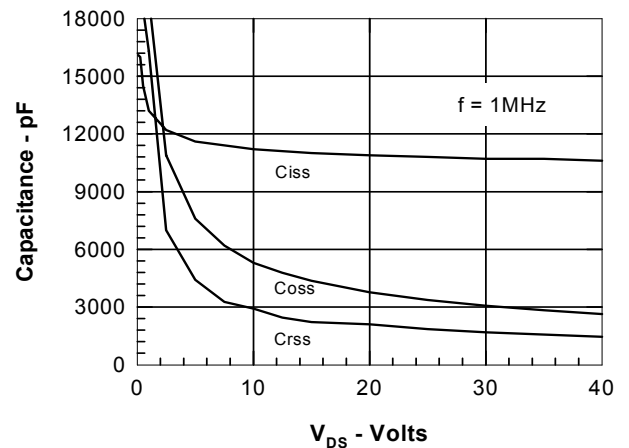


Figure 9. Forward Voltage Drop of the Intrinsic Diode

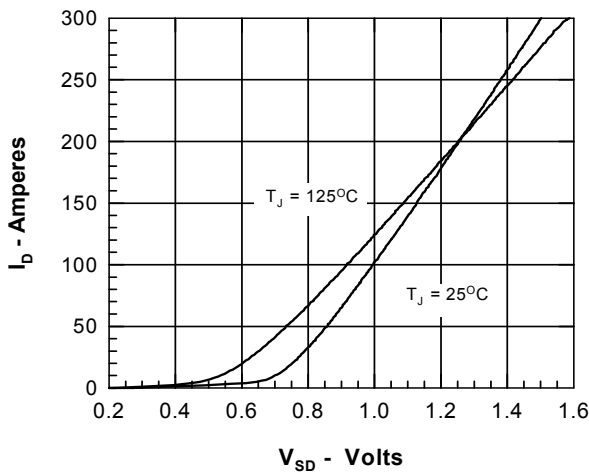


Figure 10. Forward Bias Safe Operating Area

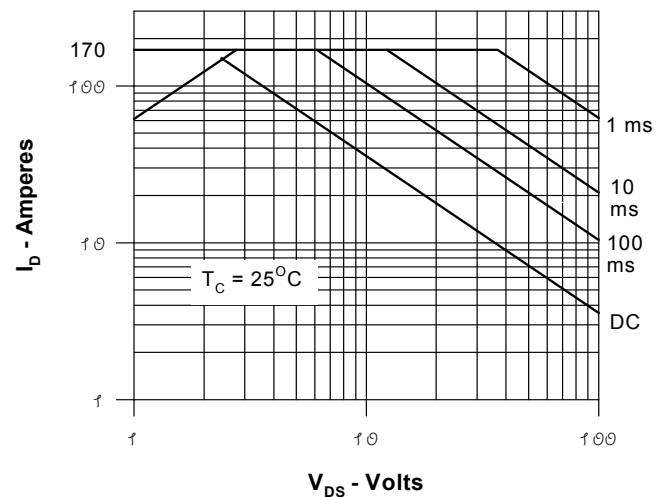
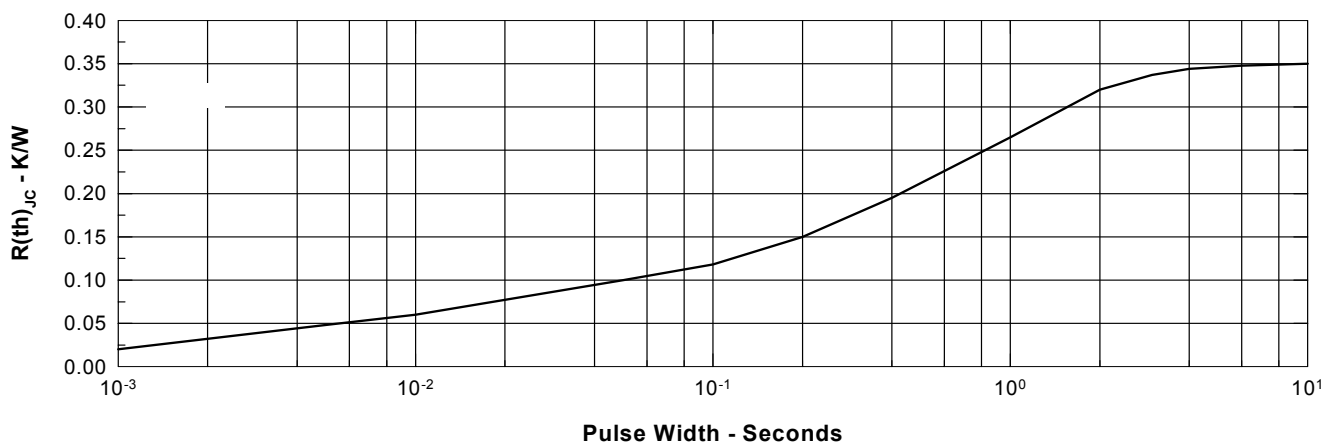


Figure 11. Transient Thermal Resistance





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