

HiPerFET™ Power MOSFET

Single Die MOSFET

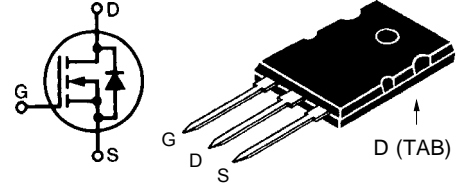
Preliminary data sheet

IXFN 55N50
IXFN 50N50
IXFK 55N50
IXFK 50N50

V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
500V	55A	80mΩ	250ns
500V	50A	100mΩ	250ns
500V	55A	80mΩ	250ns
500V	50A	100mΩ	250ns

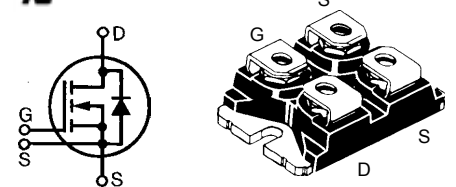
Symbol	Test Conditions	Maximum Ratings			
		IXFK 55N50	IXFK 50N50	IXFN 55N50	IXFN 50N50
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500		500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C	500		500	V
V_{GS}	Continuous	±20		±20	V
V_{GSM}	Transient	±30		±30	V
I_{D25}	$T_C = 25^\circ\text{C}$	55	50	55	50 A
I_{DM}	$T_C = 25^\circ\text{C}$,	220	200	220	200 A
I_{AR}	$T_C = 25^\circ\text{C}$	55	50	55	50 A
E_{AR}	$T_C = 25^\circ\text{C}$	60		60	mJ
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	V/ns
P_D	$T_C = 25^\circ\text{C}$	560		600	W
T_J			-55 ... +150		$^\circ\text{C}$
T_{JM}			150		$^\circ\text{C}$
T_{stg}			-55 ... +150		$^\circ\text{C}$
T_L	1.6 mm (0.063 in) from case for 10 s	300		N/A	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$		N/A	2500	V~
			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

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

Features

- International standard packages
- Encapsulating epoxy meets 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
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

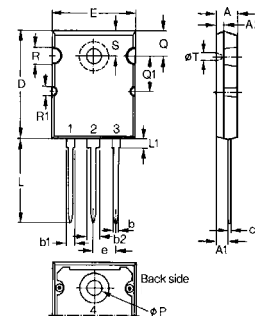
Advantages

- 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.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ mA}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8 \text{ mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$; $V_{DS} = 0 \text{ V}$			±200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0 \text{ V}$		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	25 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Note 1	55N50 50N50		80 mΩ 100 mΩ

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$				
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ Note 1		45	S
C_{iss}			9400	pF
C_{oss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		1280	pF
C_{rss}			460	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),		45	ns
t_r			60	ns
$t_{d(off)}$			120	ns
t_f			45	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		330	nC
Q_{gs}			55	nC
Q_{gd}			155	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

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

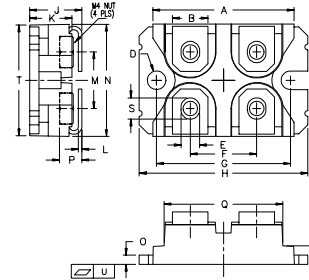
Source-Drain Diode

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

Symbol	Test Conditions	Characteristic Values			
		Min.	Typ.	Max.	
I_S	$V_{GS} = 0$	55N50 50N50		55 50	A A
I_{SM}	Repetitive; pulse width limited by T_{JM}	55N50 50N50		220 200	A A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$	Note 1		1.5	V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250	ns
Q_{RM}			1.0	μC	
I_{RM}			10	A	

Notes: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

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

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

