HiPerFET™ Power MOSFET

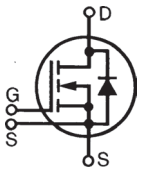
IXFE 55N50
IXFE 50N50

V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	50 A	90 mΩ
500 V	47 A	100 mΩ

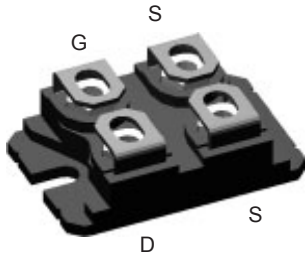
$t_{rr} \leq 250$ ns

Single Die MOSFET

Preliminary data sheet



ISOPLUS 227™ (IXFE)



G = Gate D = Drain
S = Source

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

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		500	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	55N50	47	A
		50N50	50	A
I_{DM}	T_C = 25°C; Note 1	55N50	200	A
		50N50	220	A
I_{AR}	T_C = 25°C		55	A
E_{AR}	T_C = 25°C		60	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	V/ns
P_D	T_C = 25°C		500	W
T_J			-40 ... +150	°C
T_{JM}			150	°C
T_{stg}			-40 ... +150	°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		1.5/13	Nm/lb.in.
	Terminal connection torque		1.5/13	Nm/lb.in.
Weight			19	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
V_{DSS}	V_{GS} = 0 V, I_D = 1mA		500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA		2.5		4.5	V
I_{GSS}	V_{GS} = ±20V, V_{GS} = 0V				±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$	T_J = 25°C			25	μA
	V_{GS} = 0 V	T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10V, $I_D = I_T$	55N50			90	mΩ
	Note 2	50N50			100	mΩ

Features
- Low cost direct-copper bonded aluminium package
- Encapsulating epoxy meets UL 94 V-0, flammability classification
- 2500V isolation
- Low drain to case capacitance
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier
- Conforms to SOT-227B outline

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

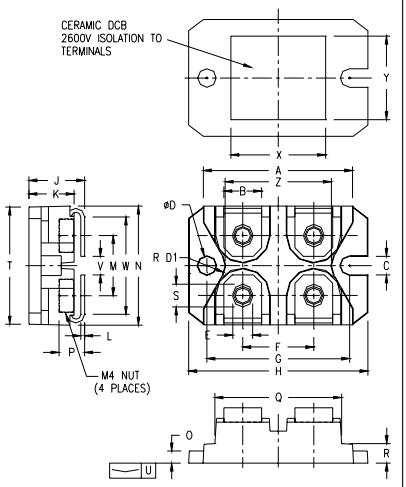
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10 V; I_D = I_T Note 2		45		S
C_{iss}			9400		pF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1200		pF
C_{rss}			460		pF
$t_{d(on)}$			45		ns
t_r	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T		60		ns
$t_{d(off)}$	R_G = 1 Ω (External),		120		ns
t_f			45		ns
$Q_{g(on)}$			330		nC
Q_{gs}	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T		55		nC
Q_{gd}			185		nC
R_{thJC}				0.25	K/W
R_{thCK}			0.07		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	55N50			55	A
		50N50			50	A
I_{SM}	Repetitive;	55N50			220	A
	pulse width limited by T_{JM}	50N50			200	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 2				1.5	V
t_{rr}	I_F = 25A, -di/dt = 100 A/µs, V_R = 100 V				250	ns
Q_{RM}				1.0		µC
I_{RM}				10		A

Notes: 1. Pulse width limited by T_{JM}.
2. Pulse test, t ≤ 300 ms, duty cycle d ≤ 2%.
3. I_T Test current:
IXFE55N50: I_T = 27.5 A
IXFE50N50: I_T = 25 A

ISOPLUS-227 B



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.240	1.270	31.50	32.26
B	.310	.330	7.87	8.38
C	.155	.165	3.94	4.19
D	.155	.165	3.94	4.19
D1	.150	.157	3.81	3.98
E	.160	.168	4.06	4.27
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.489	1.505	37.80	38.23
J	.465	.481	11.81	12.22
K	.370	.380	9.40	9.65
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.100	.105	2.54	2.67
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.160	.170	4.06	4.32
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.001	.002	-0.03	0.05
V	.130	.160	3.30	4.06
W	.780	.830	19.81	21.08
X	.770	.810	19.56	20.57
Y	.680	.720	17.27	18.29
Z	.885	.892	22.48	22.66

Please see IXFN55N50 data sheet for characteristic curves.