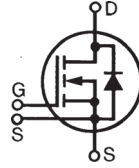


# HiPerFET™ Power MOSFET

IXFE 55N50  
IXFE 50N50

Single Die MOSFET

Preliminary data sheet



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

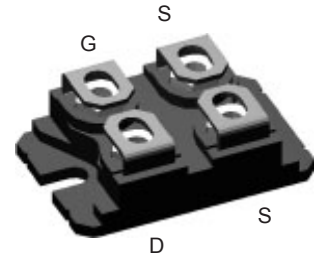
$t_{rr} \leq 250$  ns

## Symbol Test Conditions

## Maximum Ratings

$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	500	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1\text{M}\Omega$	500	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	55N50 50N50	47 50
$I_{DM}$	$T_C = 25^\circ\text{C}$ ; Note 1	55N50 50N50	200 220
$I_{AR}$	$T_C = 25^\circ\text{C}$	55	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	60	mJ
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100$ A/ $\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$ , $R_G = 2\ \Omega$	5	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	500	W
$T_J$		-40 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-40 ... +150	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ min $I_{ISOL} \leq 1$ mA $t = 1$ s	2500 3000	V~ V~
$M_d$	Mounting torque Terminal connection torque	1.5/13 Nm/lb.in. 1.5/13 Nm/lb.in.	
<b>Weight</b>		19	g

## ISOPLUS227™ (IXFE)



G = Gate  
S = Source  
D = Drain

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

## 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

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

## Characteristic Values

		Min.	Typ.	Max.
$V_{DSS}$	$V_{GS} = 0$ V, $I_D = 1$ mA	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8$ mA	2.5		4.5 V
$I_{GSS}$	$V_{GS} = \pm 20$ V, $V_{DS} = 0$ V			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0$ V		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	25 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = I_T$ Note 2	55N50 50N50		90 mΩ 100 mΩ

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = I_T$ Note 2		45	S
$C_{iss}$			9400	pF
$C_{oss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		1200	pF
$C_{rss}$			460	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External),		45	ns
$t_r$			60	ns
$t_{d(off)}$			120	ns
$t_f$			45	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$		330	nC
$Q_{gs}$			55	nC
$Q_{gd}$			185	nC
$R_{thJC}$			0.25	K/W
$R_{thCK}$		0.07		K/W

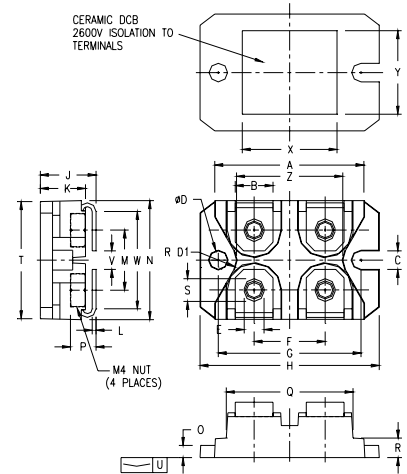
### Source-Drain Diode

( $T_J = 25^\circ\text{C}$ , 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
$V_{SD}$	$I_F = I_s, V_{GS} = 0\text{ V}$ , Note 2			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		$\mu\text{C}$
$I_{RM}$			10		A

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

### ISOPLUS-227 B



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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.

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

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 6,306,728B1 6,259,123B1 6,306,728B1  
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343