



# HiPerFET™ Power MOSFET

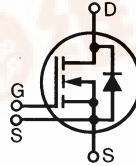
IXFE 55N50  
IXFE 50N50

$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
500 V	52 A	80 mΩ
500 V	47 A	100 mΩ

$t_{rr} \leq 250$  ns

Single Die MOSFET

Preliminary data sheet

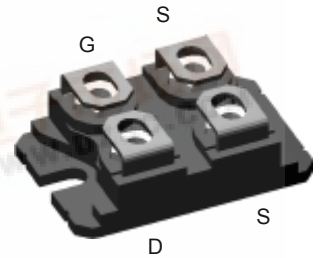


**Symbol Test Conditions**

**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: 47 50N50: 53	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ ; Note 1	55N50: 200 50N50: 220	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	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
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +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

**ISOPLUS 227™ (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**

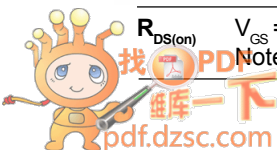
- Easy to mount
- Space savings
- High power density

**Symbol Test Conditions**

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

**Characteristic Values**

		Min.	Typ.	Max.
$V_{DSS}$	$V_{GS} = 0$ V, $I_D = 3$ 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, $V_{GS} = 0$ V			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0$ V		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	400 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = I_T$ Note 2	55N50 50N50		80 mΩ 100 mΩ

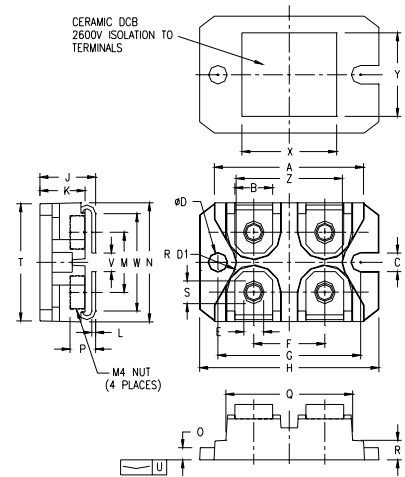


Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = I_T$ , Note 2		45	S
$C_{iss}$			9400	pF
$C_{oss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		1200	pF
$C_{rss}$			460	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (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**
 $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ 

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
$V_{SD}$	$I_F = I_s, V_{GS} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			1.3	V
$t_{rr}$	$I_F = I_s, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 25^\circ\text{C}$ $T_J = 25^\circ\text{C}$	180 30 2		ns ns $\mu\text{C}$
$Q_{RM}$			8		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.