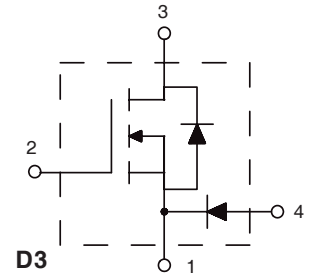
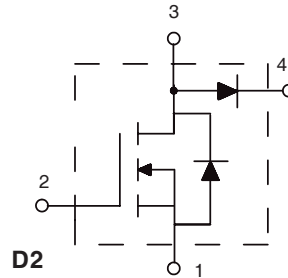


# HiPerFET™

## Power MOSFETs

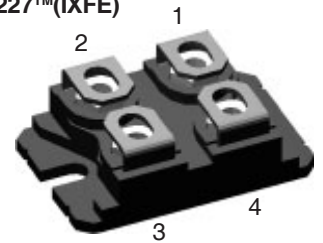
	$V_{DSS}$	$I_{D(cont)}$	$R_{DS(on)}$	$t_{rr}$
IXFE44N50QD2 IXFE44N50QD3	500 V	39 A	0.12 $\Omega$	35 ns
IXFE48N50QD2 IXFE48N50QD3	500 V	41A	0.11 $\Omega$	35 ns

Buck & Boost Configurations for PFC & Motor Control Circuits



Symbol	Test Conditions	Maximum Ratings			
HIPerFET MOSFET	$V_{DSS}$	$T_J = 25^\circ\text{C}$ 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	
	$I_{D25}$	$T_C = 25^\circ\text{C}$	44N50Q 48N50Q	39 41	A
	$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by max. $T_{JM}$	44N50Q 48N50Q	176 192	A
	$I_{AR}$	$T_C = 25^\circ\text{C}$		48	A
	$E_{AR}$	$T_C = 25^\circ\text{C}$		60	mJ
	$E_{AS}$	$T_C = 25^\circ\text{C}$		2.5	J
	$dv/dt$	$I_S \leq I_{DM1}$ , $-di/dt \leq 100\text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 2\ \Omega$		15	V/ns
$P_D$	$T_C = 25^\circ\text{C}$		400	W	
DIODE	$V_{RRM}$		600	V	
	$I_{FAVM}$	$T_C = 70^\circ\text{C}$ ; rectangular, $d = 0.5$	60	A	
	$I_{FRM}$	$t_p < 10\ \mu\text{s}$ ; pulse width limited by $T_J$	800	A	
	$P_D$	$T_C = 25^\circ\text{C}$	180	W	
CASE	$T_J$		-40 ... +150	$^\circ\text{C}$	
	$T_{JM}$		150	$^\circ\text{C}$	
	$T_{stg}$		-40 ... +150	$^\circ\text{C}$	
	$V_{ISOL}$	50/60 Hz, RMS $I_{ISOL} \leq 1\text{ mA}$	$t = 1\text{ min}$ $t = 1\text{ s}$	2500 3000	V~ V~
	$M_d$	Mounting torque Terminal connection torque (M4)		1.5/13 1.5/13	Nm/lb.in. Nm/lb.in.
<b>Weight</b>			19	g	

ISOPLUS227™(IXFE)



2 = Gate                      3 = Drain  
1 = Source                    4 = Anode/Cathode

### Features

- Popular Buck & Boost circuit topologies
- Conforms to SOT-227B outline
- Isolation voltage 3000 V~
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Low drain-to-case capacitance (<60 pF)  
- reduced RFI
- Ultra-fast FRED diode with soft reverse recovery

### Applications

- Power factor controls and buck regulators
- DC servo and robotic drives
- DC choppers
- Switch reluctance motor controls

### Advantages

- Easy to mount with 2 screws
- Space savings
- Tightly coupled FRED

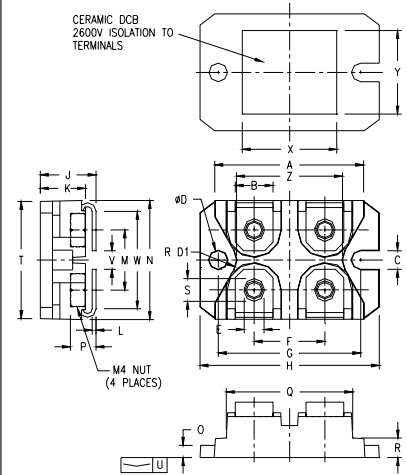
Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
V <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 1 mA	500		V
V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 4 mA	2		V
I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V <sub>DC</sub> , V <sub>DS</sub> = 0			±100 nA
I <sub>DSS</sub>	V <sub>DS</sub> = V <sub>DSS</sub> V <sub>GS</sub> = 0 V			100 μA 2 mA
R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = I <sub>T</sub>			0.12 Ω 0.11 Ω
	Pulse test, t ≤ 300 μs, duty cycle δ ≤ 2 %			

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = I <sub>T</sub> , pulse test	30	36	S
C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		8000	pF
C <sub>oss</sub>			930	pF
C <sub>rss</sub>			220	pF
t <sub>d(on)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub> R <sub>G</sub> = 1Ω (External)		33	ns
t <sub>r</sub>			22	ns
t <sub>d(off)</sub>			75	ns
t <sub>f</sub>			10	ns
Q <sub>g(on)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub>		190	nC
Q <sub>gs</sub>			40	nC
Q <sub>gd</sub>			86	nC
R <sub>thJC</sub>			0.31	K/W
R <sub>thCK</sub>		0.07		K/W

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
I <sub>R</sub>	T <sub>J</sub> = 25°C; V <sub>R</sub> = V <sub>RRM</sub> T <sub>J</sub> = 150°C; V <sub>R</sub> = 0.8V <sub>RRM</sub>			200 μA 2.5 mA
V <sub>F</sub>	I <sub>F</sub> = 60A, V <sub>GS</sub> = 0 V			2.05 V
	Note1 T <sub>J</sub> = 150°C			1.4 V
t <sub>rr</sub>	I <sub>F</sub> = 1A, di/dt = -200 A/μs, V <sub>R</sub> = 30 V, T <sub>J</sub> = 25°C		35	50 ns
I <sub>RM</sub>	I <sub>F</sub> = 60A, di/dt = -100 A/μs, V <sub>R</sub> = 100 V, T <sub>J</sub> = 100°C			8.3 A
R <sub>thJC</sub>				0.7 K/W
R <sub>thJK</sub>		0.05		K/W

Note: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %  
2. IXFE44N50 I<sub>T</sub> = 22A  
IXFE48N50 I<sub>T</sub> = 24A

### 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 note:

For characteristic curves please see IXFK48N50Q

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