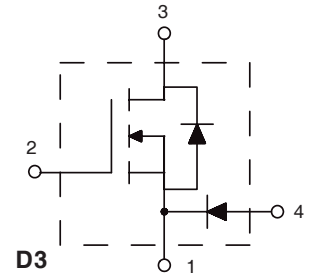
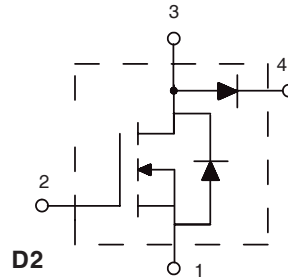


HiPerFET™

Power MOSFETs

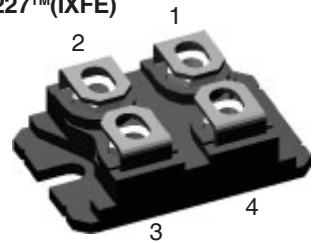
		V_{DSS}	$I_{D(cont)}$	$R_{DS(on)}$	t_{rr}
IXFE44N50QD2	IXFE44N50QD3	500 V	39 A	0.12 Ω	35 ns
IXFE48N50QD2	IXFE48N50QD3	500 V	41A	0.11 Ω	35 ns

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°C	500	V
	V_{DGR} $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	500	V
	V_{GS} Continuous	± 20	V
	V_{GSM} Transient	± 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 $I_S \leq I_{DM}$, $-di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	15	V/ns
DIODE	P_D $T_C = 25^\circ\text{C}$	400	W
	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
CASE	P_D $T_C = 25^\circ\text{C}$	180	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 $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	2500 3000	V~ V~
	M_d Mounting torque Terminal connection torque (M4)	1.5/13 1.5/13	Nm/lb.in. Nm/lb.in.
	Weight	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 ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 4\text{ mA}$	2		V
I_{GSS}	$V_{GS} = \pm 20\text{ V}_{DC}, V_{DS} = 0$			$\pm 100\text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}, V_{GS} = 0\text{ V}$			$100\text{ }\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = I_T$			$0.12\text{ }\Omega$ $0.11\text{ }\Omega$
Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\delta \leq 2\%$				

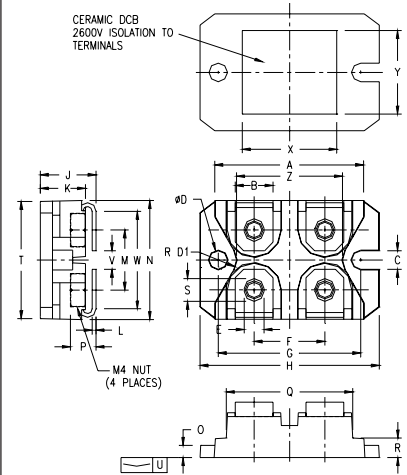
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}, I_D = I_T$, pulse test	30	36	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		8000	pF
C_{oss}			930	pF
C_{rss}			220	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5\text{ V}_{DSS}, I_D = I_T$ $R_G = 1\Omega$ (External)		33	ns
t_r			22	ns
$t_{d(off)}$			75	ns
t_f			10	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5\text{ V}_{DSS}, I_D = I_T$		190	nC
Q_{gs}			40	nC
Q_{gd}			86	nC
R_{thJC}				0.31 K/W
R_{thCK}			0.07	K/W

Ultra-fast Diode

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_R	$T_J = 25^\circ\text{C}; V_R = V_{RRM}$ $T_J = 150^\circ\text{C}; V_R = 0.8V_{RRM}$			$200\text{ }\mu\text{A}$ 2.5 mA
V_F	$I_F = 60\text{ A}, V_{GS} = 0\text{ V}$			2.05 V
	Note1 $T_J = 150^\circ\text{C}$			1.4 V
t_{rr}	$I_F = 1\text{ A}, di/dt = -200\text{ A}/\mu\text{s}, V_R = 30\text{ V}, T_J = 25^\circ\text{C}$		35	50 ns
I_{RM}	$I_F = 60\text{ A}, di/dt = -100\text{ A}/\mu\text{s}, V_R = 100\text{ V}, T_J = 100^\circ\text{C}$			8.3 A
R_{thJC}				0.7 K/W
R_{thJK}			0.05	K/W

Note: 1. Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $d \leq 2\%$
 2. IXFE44N50 $I_T = 22\text{ A}$
 IXFE48N50 $I_T = 24\text{ A}$

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 note:

For characteristic curves please see
IXFK48N50Q

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:

4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505
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	6,683,344

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