

HiPerFET™ Power MOSFETs Q-CLASS

IXFK/IXFX 48N50Q
IXFK/IXFX 44N50Q

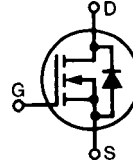
V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	48 A	100 mΩ
500 V	44 A	120 mΩ

$t_{rr} \leq 250$ ns

Single MOSFET Die

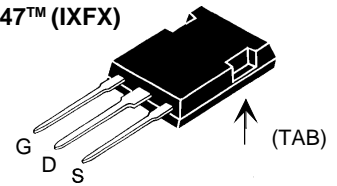
N-Channel Enhancement Mode
Avalanche Rated, Low Q_g
High dV/dt , Low t_{rr}

Preliminary data

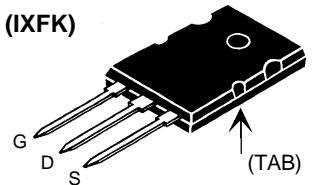


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ MΩ	500	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	$T_C = 25^\circ\text{C}$	44N50 48N50	44 48
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	44N50 48N50	176 192
I_{AR}	$T_C = 25^\circ\text{C}$		48
E_{AR}	$T_C = 25^\circ\text{C}$		60 mJ
E_{AS}	$T_C = 25^\circ\text{C}$		2.5 J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/μs, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω		5 V/ns
P_D	$T_C = 25^\circ\text{C}$	500	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.063 in.) from case for 10 s	300	°C
M_d	Mounting torque	TO-264	0.4/6 Nm/lb.in.
Weight		PLUS 247	6 g
		TO-264	10 g

PLUS 247™ (IXFX)



TO-264 AA (IXFK)



G = Gate
S = Source

D = Drain
TAB = Drain

Features

- IXYS advanced low Q_g process
- Low gate charge and capacitances
- easier to drive
- faster switching
- International standard packages
- Low $R_{DS(on)}$
- Rated for unclamped Inductive load switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls

Advantages

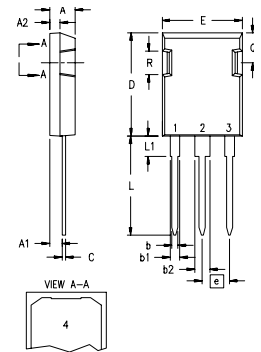
- PLUS 247™ package for clip or spring mounting
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 250$ μA	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4$ mA	2.0		4.0 V
I_{GSS}	$V_{GS} = \pm 20$ V, $V_{DS} = 0$			±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0$ V $T_J = 125^\circ\text{C}$			100 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 \cdot I_{D25}$ Note 1	44N50 48N50		120 mΩ 100 mΩ

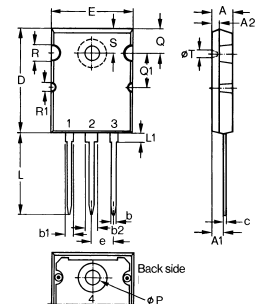
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ Note 1	30	45	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		6400	pF
C_{oss}			930	pF
C_{rss}			220	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External),		33	ns
t_r			22	ns
$t_{d(off)}$			75	ns
t_f			10	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		190	nC
Q_{gs}			40	nC
Q_{gd}			86	nC
R_{thJC}			0.26	K/W
R_{thCK}		0.15		K/W

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			48 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			192 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Note 1			1.5 V
t_{rr}	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250 ns
Q_{RM}			1.4	μC
I_{RM}			10	A

Note: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

PLUS247™ (IXFX) Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

TO-264 AA (IXFK) Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A ₁	2.54	2.89	.100	.114
A ₂	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b ₁	2.39	2.69	.094	.106
b ₂	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072