IXYS

HiPerFET™ Power MOSFETs ISOPLUS247™

(Electrically Isolated Backside)

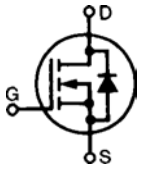
IXFR 4N100Q

V_{DSS} = 1000 V
I_{D25} = 3.5 A
$R_{DS(on)}$ = 3.0 Ω

$t_{rr} \leq$ 200ns

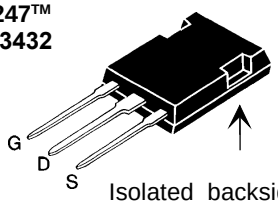
N-Channel Enhancement Mode
Avalanche Rated, Low Q_g, High dv/dt

Preliminary Data



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	1000	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	1000	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	3.5	A
I_{DM}	T_C = 25°C, Note 1	16	A
I_{AR}	T_C = 25°C	4	A
E_{AR}	T_C = 25°C	20	mJ
E_{AS}	T_C = 25°C	700	mJ
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$ $T_J \leq$ 150°C, R_G = 2 Ω	5	V/ns
P_D	T_C = 25°C	80	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
V_{ISOL}	50/60 Hz, RMS t = 1 min	2500	V~
Weight		5	g

ISOPLUS 247™
E153432



Isolated backside*

G = Gate D = Drain
S = Source

* Patent pending

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.
V_{DSS}	V_{GS} = 0 V, I_D = 1mA	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 1.5 mA	3.0		5.0 V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V	T_J = 25°C		50 µA
		T_J = 125°C		1 mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$ Notes 2, 3			3.0 Ω

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<30pF)
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Rated for Unclamped Inductive Load Switching (UIS)
- Fast intrinsic Rectifier

Applications

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

Advantages

- Easy assembly
- Space savings
- High power density

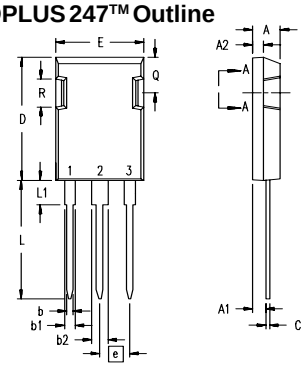
Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = I_T Notes 2, 3	1.5	2.5		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1050		pF
C_{oss}			120		pF
C_{rss}			30		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T R_G = 2 Ω (External), Notes 2, 3		17		ns
t_r			15		ns
$t_{d(off)}$			32		ns
t_f			18		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T Notes 2, 3		39		nC
Q_{gs}			9		nC
Q_{gd}			22		nC
R_{thJC}				1.57	K/W
R_{thCK}			0.15		K/W

Source-Drain Diode

Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	min.	typ.	max.	
I_S	V_{GS} = 0 V			4	A
I_{SM}	Repetitive; Note 1			16	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Notes 2, 3			1.5	V
t_{rr}	I_F = 50A,-di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			0.52		µC
I_{RM}			1.8		A

Note: 1. Pulse width limited by T_{JM}
2. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %
3. I_T = 2 A

ISOPLUS 247™ Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

Dim.	Millimeter Min.	Max.	Inches 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	0.244
R	4.32	4.83	.170	.190

See IXFH4N100Q data sheet for Characterisitic curves.

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

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