

# HiPerFET™ Power MOSFETs ISOPLUS247™ (Electrically Isolated Backside)

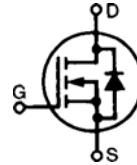
## IXFR 4N100Q

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

$t_{rr} \leq 200 \text{ ns}$

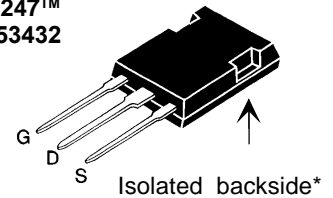
N-Channel Enhancement Mode  
 Avalanche Rated, Low  $Q_g$ , High  $dv/dt$

Preliminary Data



Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1000	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	1000	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	3.5	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Note 1	16	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	4	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	20	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	700	mJ
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$	5	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	80	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6 mm (0.063 in.) from case for 10 s	300	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $t = 1 \text{ min}$	2500	V~
<b>Weight</b>		5	g

ISOPLUS247™  
 E153432



G = Gate      D = Drain  
 S = Source

\* Patent pending

### 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

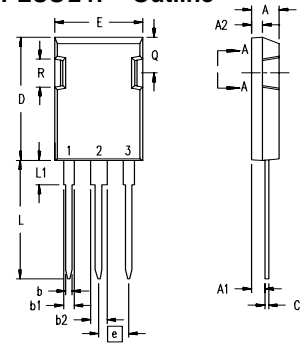
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 1 \text{ mA}$	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 1.5 \text{ mA}$	3.0		5.0 V
$I_{GSS}$	$V_{GS} = \pm 20 V_{DC}$ , $V_{DS} = 0$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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
			min.	typ.	max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = I_T$	Notes 2, 3	1.5	2.5	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$			1050	pF
$C_{oss}$				120	pF
$C_{rss}$				30	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ $R_G = 2\ \Omega$ (External), Notes 2, 3			17	ns
$t_r$				15	ns
$t_{d(off)}$				32	ns
$t_f$				18	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ 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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$			4 A
$I_{SM}$	Repetitive; Note 1			16 A
$V_{SD}$	$I_F = I_S, V_{GS} = 0\text{ V}$ , Notes 2, 3			1.5 V
$t_{rr}$	$I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250 ns
$Q_{RM}$				0.52 $\mu\text{C}$
$I_{RM}$				1.8 A

Note: 1. Pulse width limited by  $T_{JM}$   
 2. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$   
 3.  $I_T = 2\text{ A}$

### ISOPLUS 247™ Outline



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

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	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 Characteristic curves.



---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).