

# HiPerFET™ Power MOSFETs

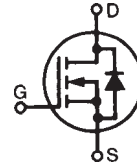
## ISOPLUS247™ Q CLASS

	$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
IXFR 12N100Q	1000 V	10 A	1.1 $\Omega$
IXFR 10N100Q	1000 V	9 A	1.20 $\Omega$

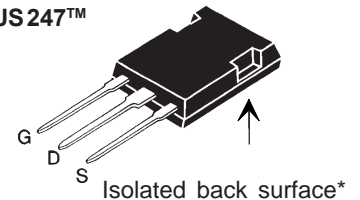
(Electrically Isolated Back Surface)

$t_{rr} \leq 300 \mu s$

N-Channel Enhancement Mode  
Avalanche Rated, High  $dV/dt$   
Low Gate Charge and Capacitances



ISOPLUS247™



G = Gate      D = Drain  
S = Source

\* Patent pending

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	1000	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ ; $R_{GS} = 1 M\Omega$	1000	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ C$	12N100: 10 10N100: 9	A
$I_{DM}$	$T_C = 25^\circ C$ , Pulse width limited by $T_{JM}$	12N100: 48 10N100: 40	A
$I_{AR}$	$T_C = 25^\circ C$	12N100: 12 10N100: 10	A
$E_{AR}$	$T_C = 25^\circ C$	30	mJ
$dv/dt$	$I_S \leq I_{DM}$ , $di/dt \leq 100 A/\mu s$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ C$ , $R_G = 2 \Omega$	5	V/ns
$P_D$	$T_C = 25^\circ C$	250	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	1.6 mm (0.063 in.) from case for 10 s	300	$^\circ C$
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ min	2500	V~
Weight		5	g

### Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance (<50pF)
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic Rectifier

### Applications

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

### Advantages

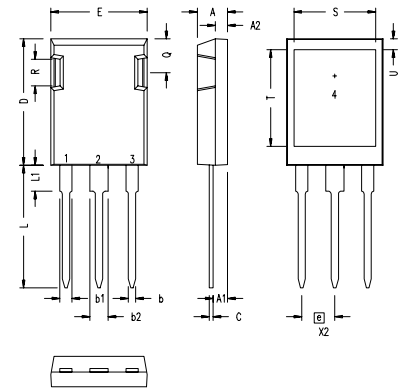
- Easy assembly
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ C$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0 V$ , $I_D = 3mA$	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 4mA$	2.5		V
$I_{GSS}$	$V_{GS} = \pm 20 V_{DC}$ , $V_{DS} = 0$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 V$	$T_J = 25^\circ C$ $T_J = 125^\circ C$		50 $\mu A$ 1 mA
$R_{DS(on)}$	$V_{GS} = 10 V$ , $I_D = I_T$ Notes 1 & 2	12N100 10N100		1.1 $\Omega$ 1.2 $\Omega$

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
			min.	typ.	max.
$g_{fs}$	$V_{DS} = 15\text{ V}; I_D = I_T$	Note 1	4	10	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$			2900	pF
$C_{oss}$				315	pF
$C_{rss}$				50	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$ $R_G = 1\ \Omega$ (External),			20	ns
$t_r$				23	ns
$t_{d(off)}$				40	ns
$t_f$				15	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$			90	nC
$Q_{gs}$				30	nC
$Q_{gd}$				40	nC
$R_{thJC}$				0.50	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.	
$I_S$	$V_{GS} = 0\text{ V}$			12 A	
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			48 A	
$V_{SD}$	$I_F = I_S, V_{GS} = 0\text{ V}$ , Note 1			1.3 V	
$t_{rr}$	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			200	300 ns
$Q_{RM}$				1.6	$\mu\text{C}$
$I_{RM}$				7	A

Note: 1. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$   
 2.  $I_T$  test current: IXFR10N100  $I_T = 5\text{ A}$   
 IXFR12N100  $I_T = 6\text{ A}$

**ISOPLUS 247 OUTLINE**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

Note: Please see IXFH12N100Q Data Sheet for characteristic curves.



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