

# HiPerFET™ Power MOSFETs

## ISOPLUS247™

F-Class: MegaHertz Switching

(Electrically Isolated Back Surface)

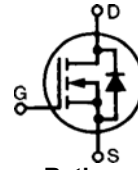
N-Channel Enhancement Mode  
Avalanche Rated, High dV/dt  
Low Gate Charge and Capacitances

Preliminary Data Sheet

IXFR 12N100F  
IXFR 10N100F

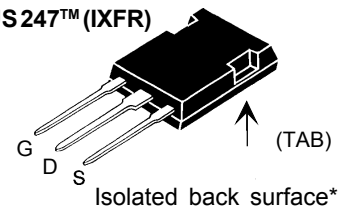
$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
1000 V	10 A	1.05 $\Omega$
1000 V	9 A	1.20 $\Omega$

$t_{rr} \leq 250$  ns



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 $150^\circ\text{C}$ ; $R_{GS} = 1$ M $\Omega$	1000	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	12N100	10 A
		10N100	9 A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Pulse width limited by $T_{JM}$	12N100	48 A
		10N100	40 A
$I_{AR}$	$T_C = 25^\circ\text{C}$	12N100	12 A
		10N100	10 A
$E_{AR}$	$T_C = 25^\circ\text{C}$	31	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	1	J
dv/dt	$I_S \leq I_{DM}$ , di/dt $\leq 100$ A/ $\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$ , $R_G = 2$ $\Omega$	5	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	250	W
$T_J$		-40 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-40 ... +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 $t = 1$ min	2500	V~
Weight		5	g

ISOPLUS247™ (IXFR)



G = Gate                      D = Drain  
S = Source                    TAB = Drain

### Features

- RF capable MOSFETs
- Double metal process for low gate resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance - easy to drive and to protect
- Fast intrinsic rectifier

### Applications

- DC-DC converters
- Switched-mode and resonant-mode power supplies, >500kHz switching
- DC choppers
- 13.5 MHz industrial applications
- Pulse generation
- Laser drivers
- RF amplifiers

### Advantages

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

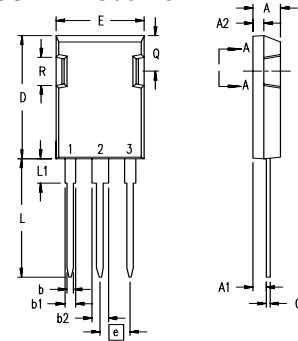
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0$ V, $I_D = 1$ mA	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 4$ mA	3.0		5.5 V
$I_{GSS}$	$V_{GS} = \pm 20$ V, $V_{DS} = 0$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0$ V	$T_J = 25^\circ\text{C}$		50 $\mu\text{A}$
		$T_J = 125^\circ\text{C}$		1.5 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = I_T$ Notes 1 & 2	12N100		1.05 $\Omega$
		10N100		1.2 $\Omega$

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
			min.	typ.	max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = I_T$	Note 1	8	12	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$			2700	pF
$C_{oss}$				305	pF
$C_{rss}$				93	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)			12	ns
$t_r$				9.8	ns
$t_{d(off)}$				31	ns
$t_f$				12	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = I_T$			77	nC
$Q_{gs}$				16	nC
$Q_{gd}$				42	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)	Characteristic Values		
			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			1.5	V
$t_{rr}$	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250	ns
$Q_{RM}$				0.8	$\mu\text{C}$
$I_{RM}$				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  $I_T = 6\text{ A}$

### PLUS 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