

# HiPerFET™ Power MOSFETs IXFR 70N15 ISOPLUS247™

(Electrically Isolated Backside)

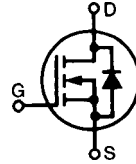
N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt, Low  $t_{rr}$

$$V_{DSS} = 150 \text{ V}$$

$$I_{D25} = 67 \text{ A}$$

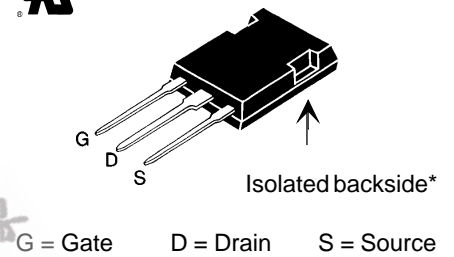
$$R_{DS(on)} = 28 \text{ m}\Omega$$

$$t_{rr} \leq 250 \text{ ns}$$



Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	150	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	150	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$ (MOSFET chip capability)	67	A
$I_{D(RMS)}$	External lead (current limit)	280	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Note 1	70	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	70	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	30	mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$	1.0	J
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
$P_D$	$T_C = 25^\circ\text{C}$	250	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~
Weight		5	g

ISOPLUS 247™  
E153432



\* 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

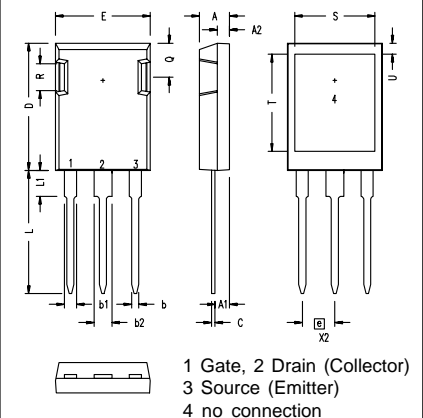
## Advantages

- Easy assembly
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$	150		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 4 \text{ mA}$	2.0		4.0 V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0$			$\pm 100 \text{ nA}$
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	25 $\mu\text{A}$ 750 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = I_T$ Notes 2, 3			28 m $\Omega$

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 10 V; I <sub>D</sub> = I <sub>T</sub> Notes 2, 3	30	45	S
<b>C<sub>iss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		3600	pF
<b>C<sub>oss</sub></b>			1080	pF
<b>C<sub>rss</sub></b>			360	pF
<b>t<sub>d(on)</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub> R <sub>G</sub> = 1 Ω (External), Notes 2, 3		35	ns
<b>t<sub>r</sub></b>			52	ns
<b>t<sub>d(off)</sub></b>			70	ns
<b>t<sub>f</sub></b>			23	ns
<b>Q<sub>g(on)</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub> Notes 2, 3		180	nC
<b>Q<sub>gs</sub></b>			28	nC
<b>Q<sub>gd</sub></b>			92	nC
<b>R<sub>thJC</sub></b>			0.5	K/W
<b>R<sub>thCK</sub></b>		0.15		K/W

### ISOPLUS 247 (IXFR) OUTLINE



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
L <sub>1</sub>	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190
S	13.21	13.72	.520	.540
T	15.75	16.26	.620	.640
U	1.65	3.03	.065	.080

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
<b>I<sub>S</sub></b>	V <sub>GS</sub> = 0 V			70 A
<b>I<sub>SM</sub></b>	Repetitive; Note 1			280 A
<b>V<sub>SD</sub></b>	I <sub>F</sub> = I <sub>T</sub> , V <sub>GS</sub> = 0 V, Notes 2, 3			1.5 V
<b>t<sub>rr</sub></b>	I <sub>F</sub> = 50A, -di/dt = 100 A/μs, V <sub>R</sub> = 100 V			250 ns
<b>Q<sub>RM</sub></b>			0.85	μC
<b>I<sub>RM</sub></b>			8	A

- Note: 1. Pulse width limited by T<sub>JM</sub>  
 2. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %  
 3. I<sub>T</sub> = 35A