

## HiPerFET™ Power MOSFET

(Electrically Isolated Tab)

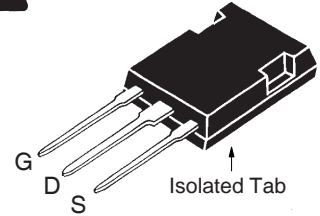
N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Rectifier

## IXFR120N20



$$\begin{aligned} V_{DSS} &= 200V \\ I_{D25} &= 105A \\ R_{DS(on)} &\leq 19.5m\Omega \\ t_{rr} &\leq 250ns \end{aligned}$$

ISOPLUS247  
E153432



G = Gate    D = Drain  
S = Source

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	200	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1M\Omega$	200	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	105	A
$I_{LRMS}$	Terminal Current Limit	76	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$	480	A
$I_A$	$T_C = 25^\circ\text{C}$	120	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	3	J
$dv/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$	5	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	417	W
$T_J$		- 55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		- 55 ... +150	$^\circ\text{C}$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, 1 Minute	2500	V~
$F_C$	Mounting Force	20..120/4.5..27	N/lb
<b>Weight</b>		5	g

### Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- Avalanche Rated
- Fast Intrinsic Rectifier
- Low  $R_{DS(on)}$  and  $Q_G$

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

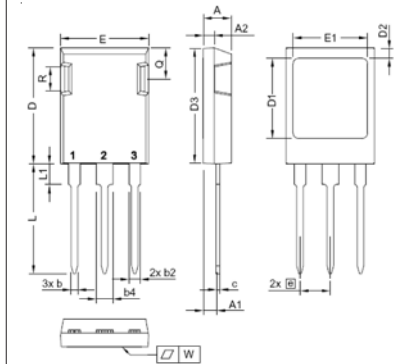
### Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC & DC Motor Controls

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 3mA$	200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8mA$	2.0		4.0 V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			100 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 60A$ , Note 1			19.5 m $\Omega$

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{V}$ , $I_D = 60\text{A}$ , Note 1	40	70	S
$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		9100	pF
$C_{oss}$			2200	pF
$C_{rss}$			1000	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 60\text{A}$ $R_G = 1\Omega$ (External)		40	ns
$t_r$			65	ns
$t_{d(off)}$			110	ns
$t_f$			35	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 60\text{A}$		360	nC
$Q_{gs}$			50	nC
$Q_{gd}$			170	nC
$R_{thJC}$			0.30	$^\circ\text{C/W}$
$R_{thCS}$		0.15		$^\circ\text{C/W}$

### ISOPLUS247 (IXFR) Outline



- 1 - Gate
- 2 - Drain
- 3 - Source

Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	5.45 BSC		0.215 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_s$	$V_{GS} = 0\text{V}$			120 A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			480 A
$V_{SD}$	$I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1			1.5 V
$t_{rr}$	$I_F = 50\text{A}$ , $-di/dt = -100\text{A}/\mu\text{s}$ $V_R = -100\text{V}$ , $V_{GS} = 0\text{V}$			250 ns
$Q_{RM}$			1.1	$\mu\text{C}$
$I_{RM}$			13	A

Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	



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