

# Polar™ HiPerFET™ **Power MOSFET**

# IXFB170N30P

N-Channel Enhancement Mode Avalanche Rated Fast Intrinsic Diode



= 300V= 170A $\leq$  18m $\Omega$  $\mathbf{R}_{\mathrm{DS(on)}}$ ≤ 200ns

Symbol	Test Conditions	Maximum R	atings
V <sub>DSS</sub>	T <sub>J</sub> = 25°C to 150°C	300	V
V <sub>DGR</sub>	$T_J = 25$ °C to 150°C, $R_{GS} = 1M\Omega$	300	V
$V_{gss}$	Continuous	±20	V
V <sub>GSM</sub>	Transient	±30	V
I <sub>D25</sub>	$T_{c} = 25^{\circ}C$	170	Α
LRMS	Leads Current Limit, RMS	160	Α
I <sub>DM</sub>	$T_{c} = 25^{\circ}C$ , Pulse Width Limited by $T_{JM}$	500	Α
I <sub>A</sub>	T <sub>C</sub> = 25°C	85	Α
<b>E</b> <sub>AS</sub>	T <sub>C</sub> = 25°C	5	J
dv/dt	$I_{S} \le I_{DM}, V_{DD} \le V_{DSS}, T_{J} \le 150^{\circ}C$	20	V/ns
$P_{D}$	T <sub>C</sub> = 25°C	1250	W
T		-55 +150	°C
<b>T</b> JM		150	°C
T <sub>stg</sub>		-55 <b>+</b> 150	°C
Т,	Maximum Lead Temperature for Soldering	300	°C
T <sub>SOLD</sub>	Plastic Body for 10s	260	°C
F <sub>c</sub>	Mounting Force	30120 / 6.727	N/lb
Weight		10	g

G = Gate	D = Dra	air
S = Source	Tab = Dra	ain

#### **Features**

PLUS264™

- Fast Intrinsic Diode
- Avalanche Rated
- Very Low R<sub>th</sub> Results High Power Dissipation
- Low R<sub>DS(ON)</sub>
  Low Package Inductance

### **Advantages**

- Low Gate Charge Results in Simple Drive Requirement
- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- High Power Density

## **Applications**

- DC-DC Coverters
- Battery Chargers
- Switched-Mode and Resonant-Mode Power Supplies
- DC Choppers
- · AC and DC Motor Control
- Uninterrupted Power Supplies
- High Speed Power Switching Applications

Symbol (T <sub>J</sub> = 25°C, U	<b>Test Conditions</b> Juless Otherwise Specified)		Charac Min.	teristic Typ.	Values Max.	
BV <sub>DSS</sub>	$V_{GS} = 0V, I_D = 3mA$		300			V
V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_{D} = 8mA$		2.5		4.5	V
I <sub>GSS</sub>	$V_{GS} = \pm 20V, V_{DS} = 0V$				±200	nA
I <sub>DSS</sub>	$V_{DS} = V_{DSS,} V_{GS} = 0V$	T <sub>J</sub> = 125°C			25 1.5	μA mA
R <sub>DS(on)</sub>	$V_{GS} = 10V, I_{D} = 0.5 \cdot I_{D25}, Note$	e 1			18	mΩ

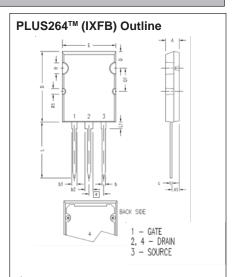




Symbol (T <sub>J</sub> = 25°C, U	Test Conditions Unless Otherwise Specified)	Chara Min.	cteristic Typ.	Values Max.	
g <sub>fs</sub>	$V_{DS} = 10V, I_{D} = 60A, Note 1$	57	95		S
C <sub>iss</sub>			20		nF
C <sub>oss</sub>	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		2450		рF
C <sub>rss</sub>			27		рF
t <sub>d(on)</sub>	Basistica Coditables Times		41		ns
t,	Resistive Switching Times		29		ns
t <sub>d(off)</sub>	$V_{GS} = 10V$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_{D} = 0.5 \cdot I_{D25}$		79		ns
t,	$R_{_{\rm G}} = 1\Omega$ (External)		16		ns
$Q_{g(on)}$			258		nC
Q <sub>gs</sub>	$V_{GS} = 10V$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_{D} = 0.5 \cdot I_{D25}$		82		nC
$Q_{gd}$			78		nC
R <sub>thJC</sub>				0.10 °	C/W
R <sub>thcs</sub>			0.13	o	C/W

### Source-Drain Diode

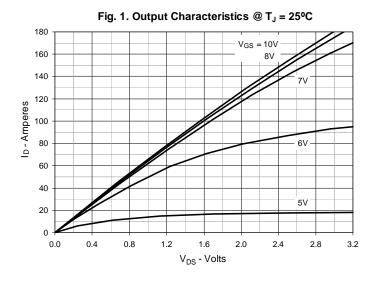
<b>Symbol Test Conditions</b> (T <sub>J</sub> = 25°C, Unless Otherwise Specified)		Charac Min.	cteristic Typ.	Values Max.	
I <sub>s</sub>	$V_{GS} = 0V$			170	Α
I <sub>SM</sub>	Repetitive, Pulse Width Limited by $T_{JM}$			500	Α
V <sub>SD</sub>	$I_F = 85A$ , $V_{GS} = 0V$ , Note 1			1.3	V
$\left. egin{array}{l} \mathbf{t}_{rr} & \\ \mathbf{Q}_{RM} & \\ \mathbf{I}_{RM} & \end{array}  ight.  ight.$	$I_F = 85A$ , -di/dt = 150A/ $\mu$ s $V_R = 100V$		1.85 21	200	ns μC A

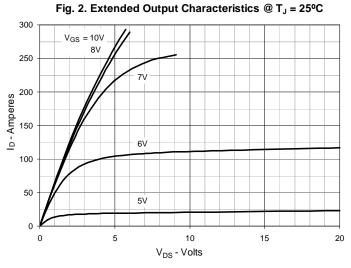


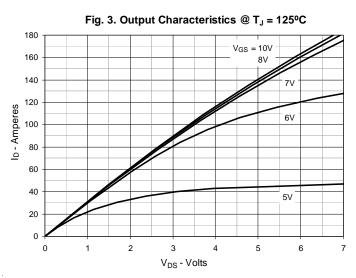
MYZ	INCH	INCHES		1ETERS
2114	MIN	MAX	MIN	MAX
Α	.185	,209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
Ь1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
С	.017	.029	0.43	0.74
D	1.007	1.047	25,58	26,59
E	.760	.799	19,30	20,29
е	.215	.215 BSC		BSC
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36

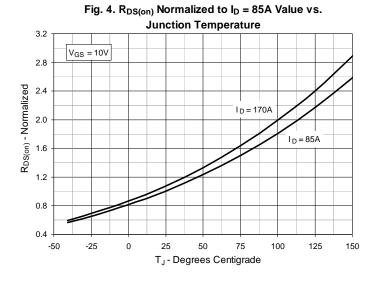
Note 1: Pulse test,  $t \le 300\mu s$ , duty cycle,  $d \le 2\%$ .

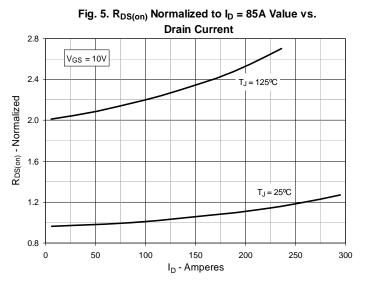


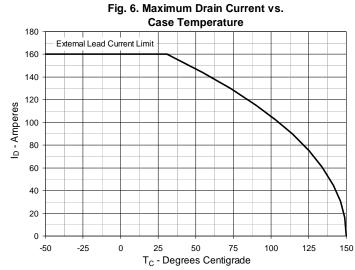




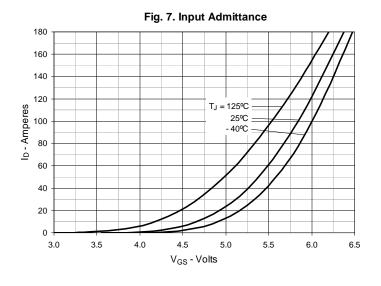


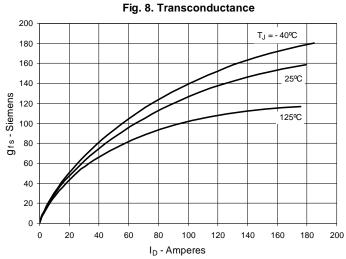


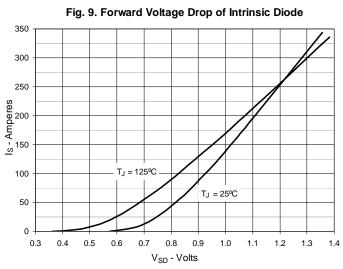


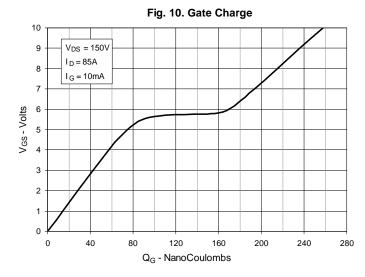


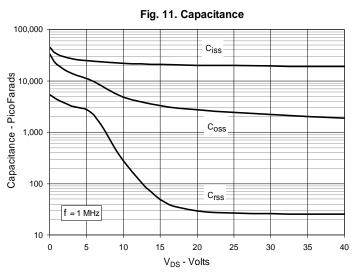


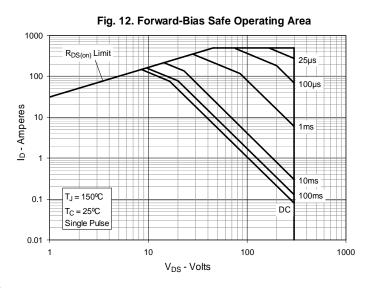












IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

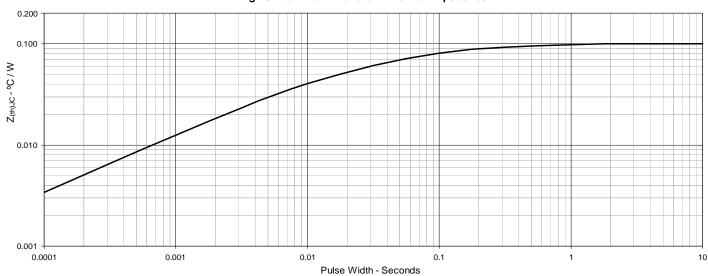


Fig.13. Maximium Transient Thermal Impedance

