

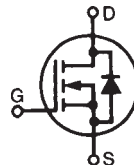
PolarHV™ HiPerFET IXFC 12N80P

Power MOSFET

ISOPLUS220™

(Electrically Isolated Back Surface)

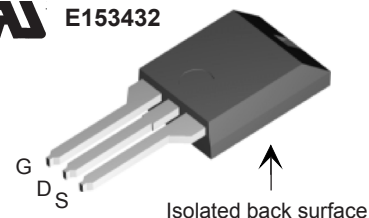
N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated



$$\begin{aligned} V_{DSS} &= 800 \text{ V} \\ I_{D25} &= 7 \text{ A} \\ R_{DS(on)} &\leq 0.93 \text{ m}\Omega \\ t_{rr} &\leq 250 \text{ ns} \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	800	V
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	800	V
V_{GS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	7	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	36	A
I_{AR}	$T_C = 25^\circ\text{C}$	6	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	1.0	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 10 \Omega$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	120	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 (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
T_{SOLD}	Plastic body for 10 s	260	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS, $t = 1$, leads-to-tab	2500	V~
F_C	Mounting Force	11..65/2.5..15	N/lb
Weight		2	g

ISOPLUS220™ (IXFC)
E153432



G = Gate
S = Source
D = Drain

Features

- Silicon chip on Direct-Copper-Bond substrate
- High power dissipation
- Isolated mounting surface
- 2500V electrical isolation
- Low drain to tab capacitance(<35pF)
- 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: no screws, or isolation foils required
- Space savings
- High power density
- Low collector capacitance to ground (low EMI)

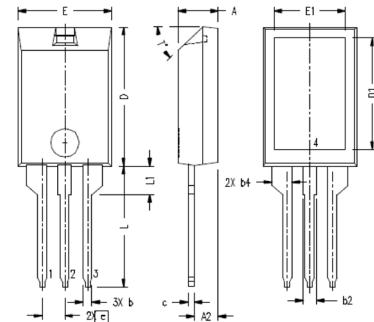
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 2.5 \text{ mA}$	3.0		5.5 V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0 \text{ V}$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			25 μA 750 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = I_T$ (Note 1) Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$			0.93 $\text{m}\Omega$

Symbol	Test Conditions	Characteristic Values (T _J = 25° C unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20 \text{ V}; I_D = I_T$, pulse test	12	18	S
C_{iss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		2800	pF
C_{oss}			210	pF
C_{rss}			19	pF
$t_{d(on)}$	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$ $R_G = 10 \Omega$ (External)		21	ns
t_r			22	ns
$t_{d(off)}$			62	ns
t_f			22	ns
$Q_{g(on)}$	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$		51	nC
Q_{gs}			13	nC
Q_{gd}			19	nC
R_{thJC}				1.05 °C/W
R_{thCS}			0.21	°C/W

Source-Drain Diode		Characteristic Values (T _J = 25° C unless otherwise specified)		
Symbol	Test Conditions	Min.	Typ.	Max.
I_S	$V_{GS} = 0 \text{ V}$			12 A
I_{SM}	Repetitive			36 A
V_{SD}	$I_F = I_S, V_{GS} = 0 \text{ V}$, Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$			1.5 V
t_{rr}	$I_F = 12 \text{ A}, -di/dt = 100 \text{ A}/\mu\text{s}$ $V_R = 100 \text{ V}, V_{GS} = 0 \text{ V}$			250 ns
I_{RM}			7	A
Q_{RM}			0.7	μC

Note 1: Test Current $I_T = 6 \text{ A}$

ISOPLUS220™ (IXFC) Outline



Note:
Bottom heatsink (Pin 4) is electrically isolated from Pin 1, 2, or 3.

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100	BASIC	2.55	BASIC
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T*			42.5°	47.5°

Ref: IXYS CO 0177 R0

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated objective result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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