IXYS

Advance Technical Information

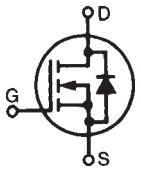
PolarHV™ HiPerFET Power MOSFET ISOPLUS220™

(Electrically Isolated Back Surface)

IXFC 12N80P

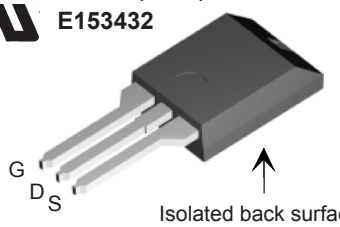
V_{DSS} = 800 V
I_{D25} = 7 A
$R_{DS(on)}$ ≤ 0.93 mΩ
t_{rr} ≤ 250 ns

N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated



ISOPLUS220™ (IXFC)

E153432



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 150° C	800	V
V_{DGR}	T_J = 25° C to 150° C; R_{GS} = 1 MΩ	800	V
V_{GS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25° C	7	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	36	A
I_{AR}	T_C = 25° C	6	A
E_{AR}	T_C = 25° C	30	mJ
E_{AS}	T_C = 25° C	1.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, T_J ≤150° C, R_G = 10 Ω	10	V/ns
P_D	T_C = 25° C	120	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°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

Symbol	Test Conditions (T_J = 25° C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	800			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 2.5 mA	3.0		5.5	V
I_{GSS}	V_{GS} = ±30 V, V_{DS} = 0 V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			25	μA
	T_J = 125° C			750	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_{T,}$ (Note 1) Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			0.93	mΩ

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)

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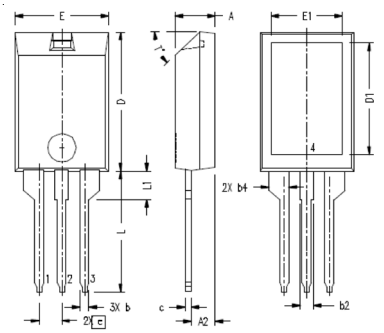
Symbol	Test Conditions (T_J = 25° C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; I_D = I_T, pulse test	12	18		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2800		pF
C_{oss}			210		pF
C_{rss}			19		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = I_T R_G = 10 Ω (External)		21		ns
t_r			22		ns
$t_{d(off)}$			62		ns
t_f			22		ns
$Q_{g(on)}$	V_{GS}= 10 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

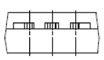
Source-Drain Diode

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

Note 1: Test Current I_T = 6 A

ISOPLUS220™ (IXFC) Outline





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

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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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IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537