

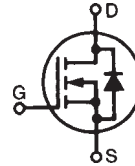
PolarHV™ HiPerFET IXFC 14N60P

Power MOSFET

ISOPLUS220™

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated

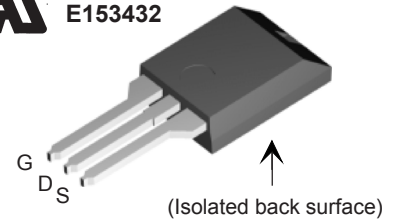


$$\begin{aligned} V_{DSS} &= 600 \text{ V} \\ I_{D25} &= 8 \text{ A} \\ R_{DS(on)} &\leq 630 \text{ m}\Omega \\ t_{rr} &\leq 200 \text{ ns} \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	600	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	600	V
V_{GS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	8	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	42	A
I_{AR}	$T_C = 25^\circ\text{C}$	14	A
E_{AR}	$T_C = 25^\circ\text{C}$	23	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	0.9	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 4 \Omega$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	100	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	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS $t = 1$ minute 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}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	600		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1.5 \text{ mA}$	3.5		5.5 V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			5 μA 50 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = I_T$, Note 1			630 $\text{m}\Omega$

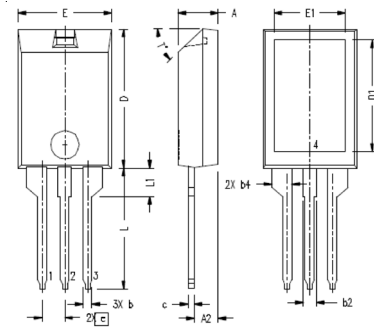
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{ V}; I_D = I_T$, Note 1	7	13	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		2300	pF
C_{oss}			215	pF
C_{rss}			13	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$ $R_G = 4\ \Omega$ (External)		23	ns
t_r			27	ns
$t_{d(off)}$			70	ns
t_f			26	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$		38	nC
Q_{gs}			14	nC
Q_{gd}			12	nC
R_{thJC}			1.25	$^\circ\text{C/W}$
R_{thCS}		0.21		$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		min.	Typ.	max.
I_S	$V_{GS} = 0\text{ V}$			8 A
I_{SM}	Repetitive			42 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Note 1			1.5 V
t_{rr}	$I_F = 14\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}, V_{GS} = 0\text{ V}$			200 ns
I_{RM}				6 A
Q_{RM}			1.0	μC

Notes:

- Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$;
Test current $I_T = 7\text{ A}$.

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

Fig. 1. Output Characteristics @ 25°C

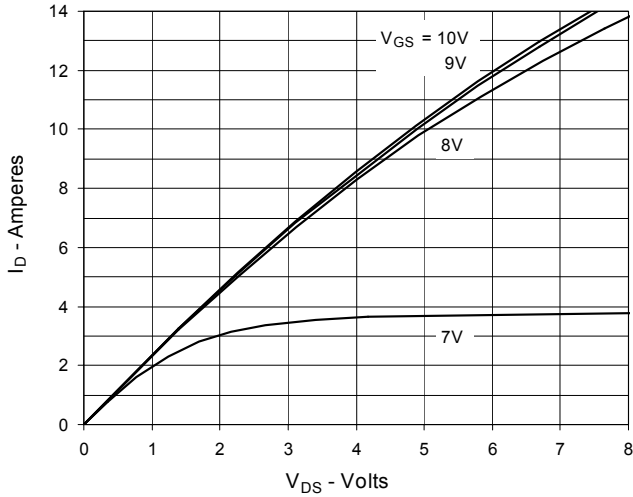


Fig. 2. Extended Output Characteristics @ 25°C

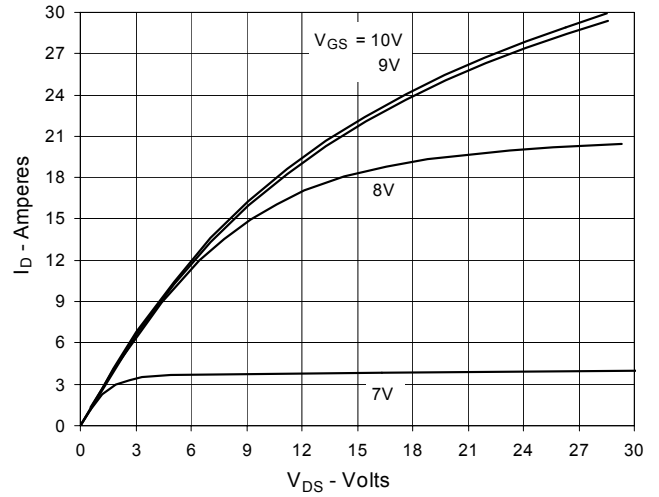


Fig. 3. Output Characteristics @ 125°C

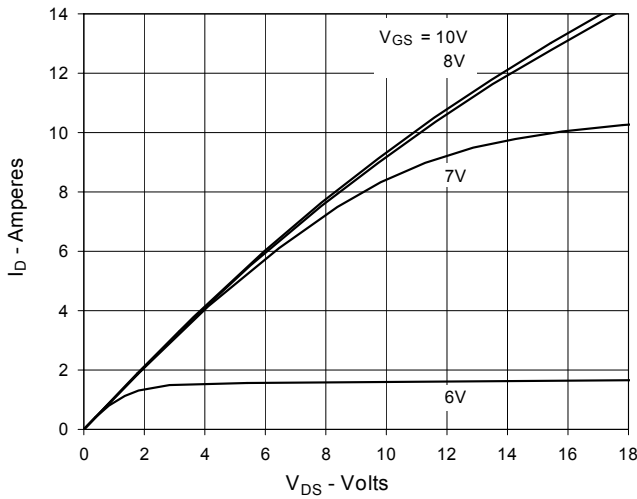


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 7A$ Value vs. Junction Temperature

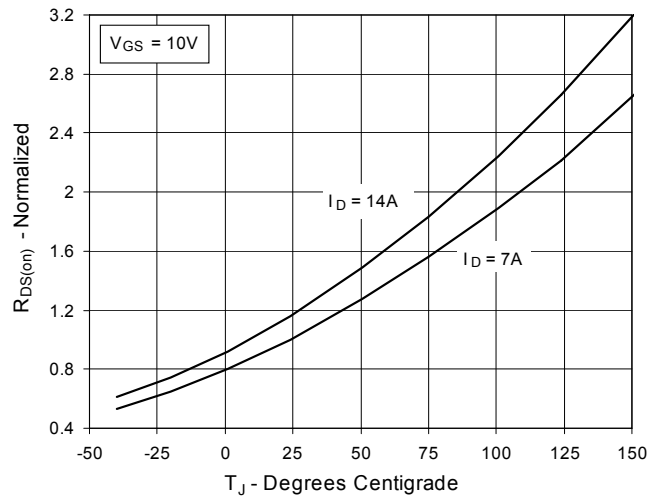


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 7A$ Value vs. Drain Current

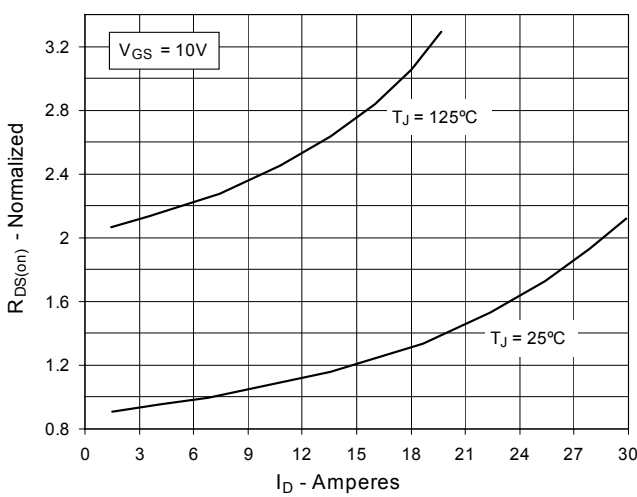


Fig. 6. Maximum Drain Current vs. Case Temperature

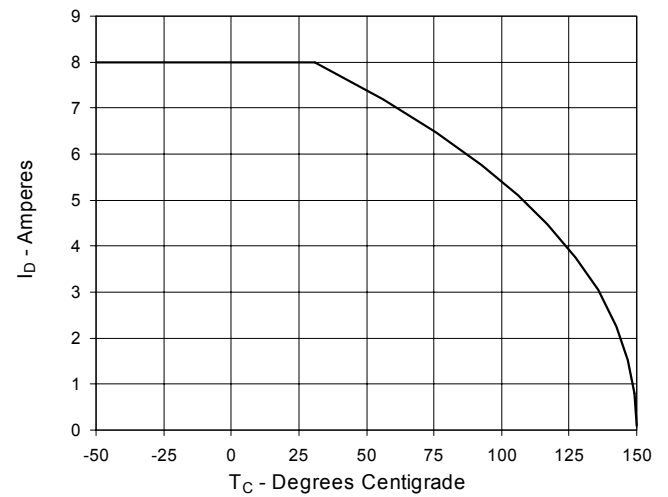


Fig. 7. Input Admittance

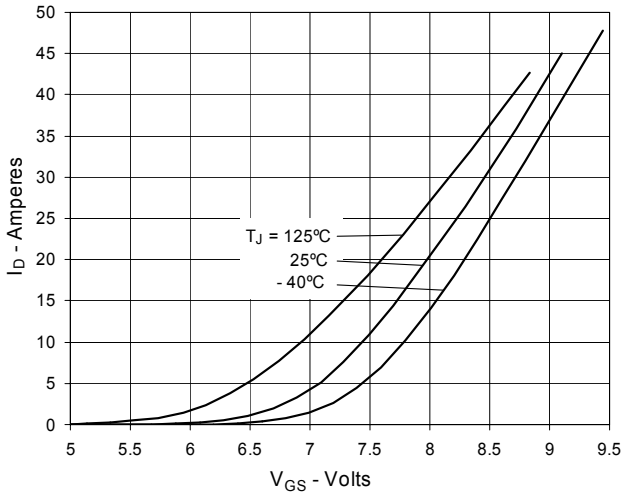


Fig. 8. Transconductance

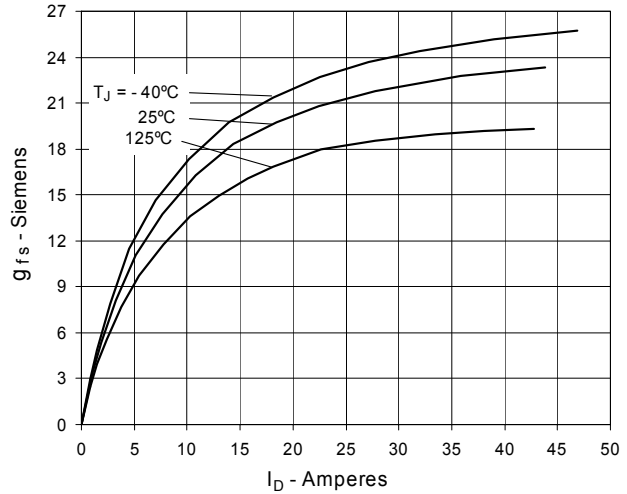


Fig. 9. Forward Voltage Drop of Intrinsic Diode

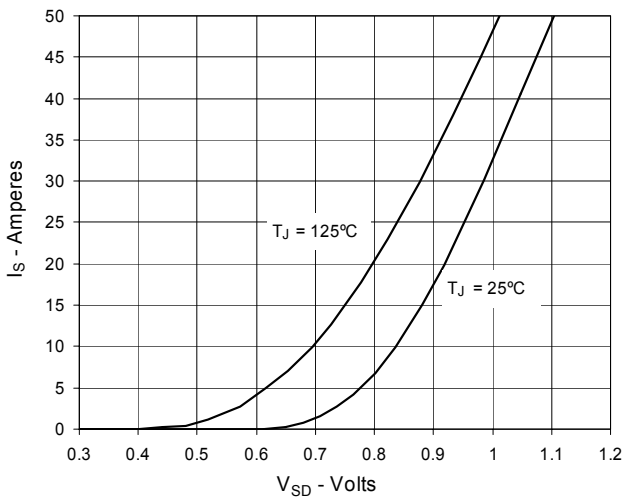


Fig. 10. Gate Charge

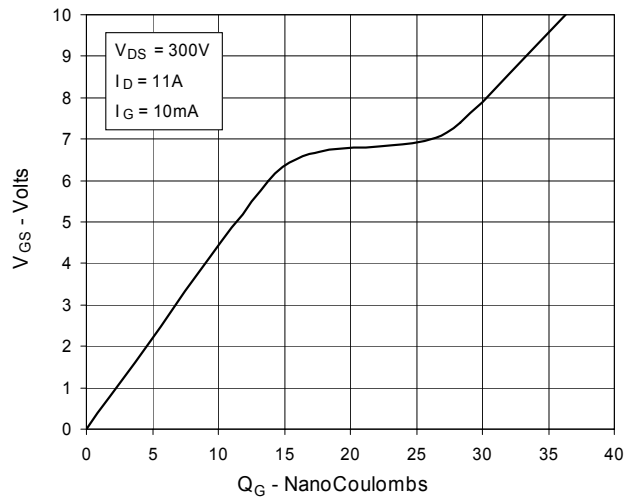


Fig. 11. Capacitance

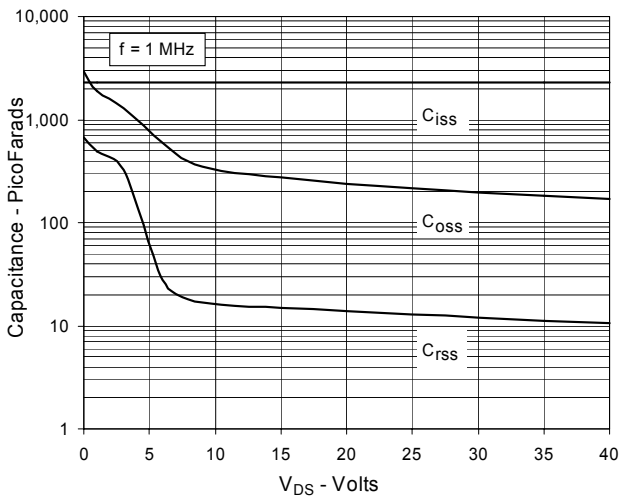


Fig. 12. Forward-Bias Safe Operating Area

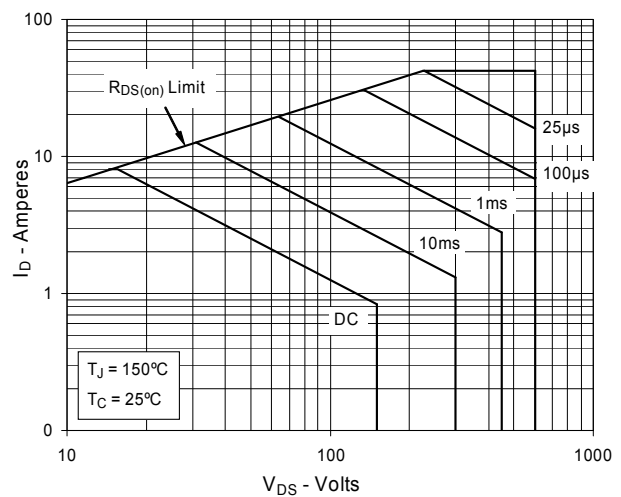


Fig. 13. Maximum Transient Thermal Resistance

