

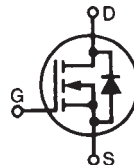
PolarHV™ HiPerFET IXFC 16N50P

Power MOSFET

ISOPLUS220™

(Electrically Isolated Back Surface)

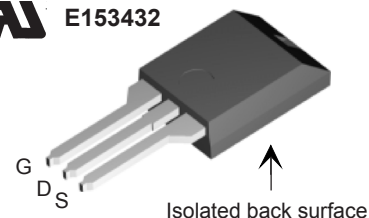
N-Channel Enhancement Mode
Fast Intrinsic Diode
Avalanche Rated



$$\begin{aligned} V_{DSS} &= 500 \text{ V} \\ I_{D25} &= 10 \text{ A} \\ R_{DS(on)} &\leq 450 \text{ m}\Omega \\ t_{rr} &\leq 200 \text{ ns} \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	500	V
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	500	V
V_{GS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	10	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	35	A
I_{AR}	$T_C = 25^\circ\text{C}$	10	A
E_{AR}	$T_C = 25^\circ\text{C}$	25	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	750	mJ
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	$T_C = 25^\circ\text{C}$	125	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)

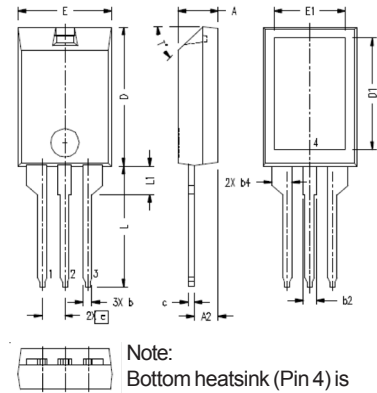
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 2.5 \text{ mA}$	3.0		5.5 V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0 \text{ V}$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			5 μA 50 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 $d \leq 2 \%$			450 $\text{m}\Omega$

Symbol	Test Conditions	Characteristic Values (T _J = 25° C unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	V _{DS} = 20 V; I _D = I _T , pulse test	9	16	S
C_{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		2250	pF
C_{oss}			240	pF
C_{rss}			12	pF
t_{d(on)}	V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} , I _D = I _T R _G = 10 Ω (External)		23	ns
t_r			25	ns
t_{d(off)}			70	ns
t_f			22	ns
Q_{g(on)}	V _{GS} = 10 V, V _{DS} = 0.5 V _{DSS} , I _D = I _T		43	nC
Q_{gs}			15	nC
Q_{gd}			12	nC
R_{thJC}			1.0	° C/W
R_{thCS}		0.21		° C/W

Symbol	Test Conditions	Characteristic Values (T _J = 25° C unless otherwise specified)		
		Min.	Typ.	Max.
I_S	V _{GS} = 0 V			16 A
I_{SM}	Repetitive			40 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 = 16 A, -di/dt = 100 A/μs V _R = 100 V, V _{GS} = 0 V		6	200 ns
I_{RM}				A
Q_{RM}				μC

Note 1: Test Current I_T = 8 A

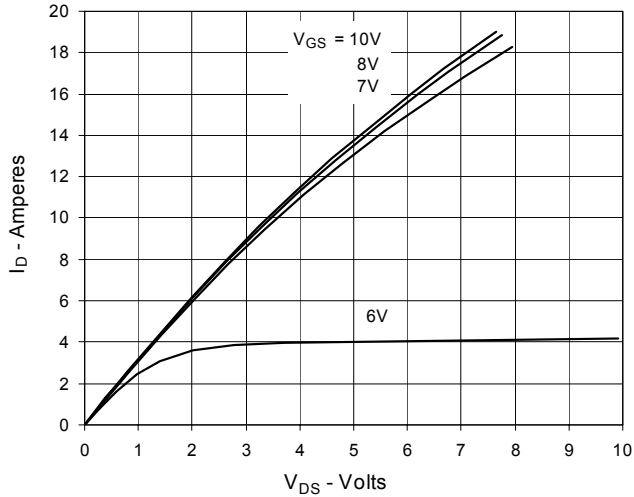
ISOPLUS220™ (IXFC) Outline



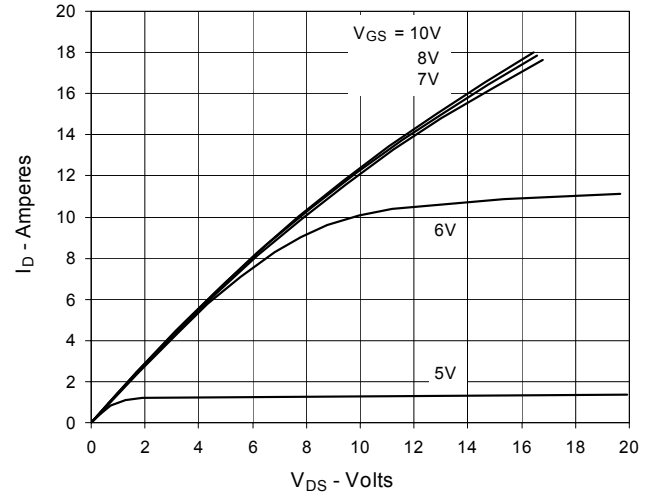
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100	BASIC	2.55	BASIC
L	.512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

Ref: IXYS CO 0177 R0

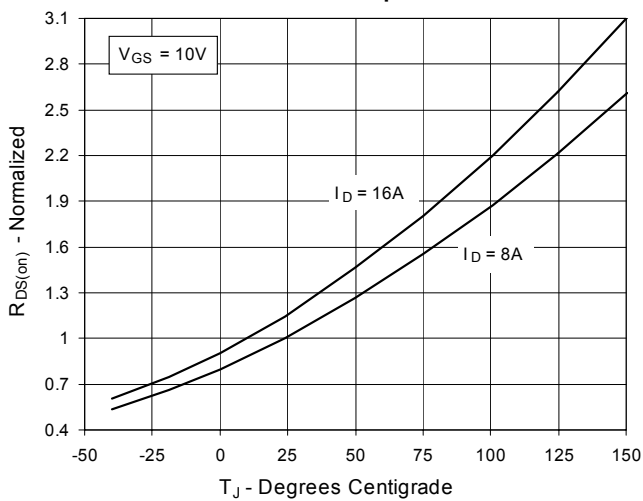
**Fig. 1. Output Characteristics
@ 25°C**



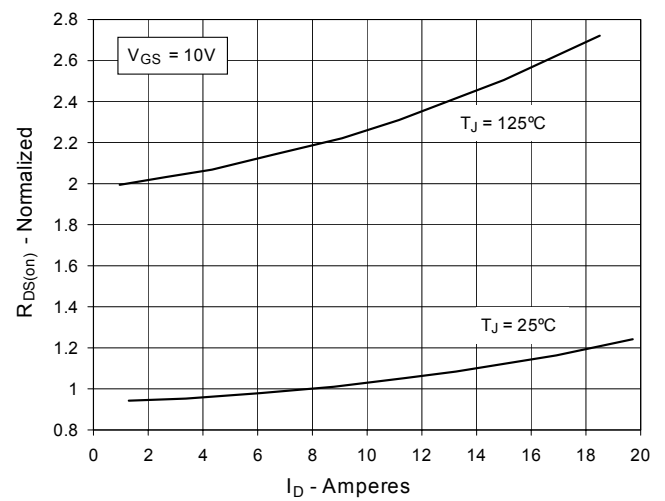
**Fig. 2. Output Characteristics
@ 125°C**



**Fig. 3. $R_{DS(on)}$ Normalized to $I_D = 8A$ vs.
Junction Temperature**



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 8A$ vs. Drain
Current**



**Fig. 5. Maximum Drain Current vs.
Case Temperature**

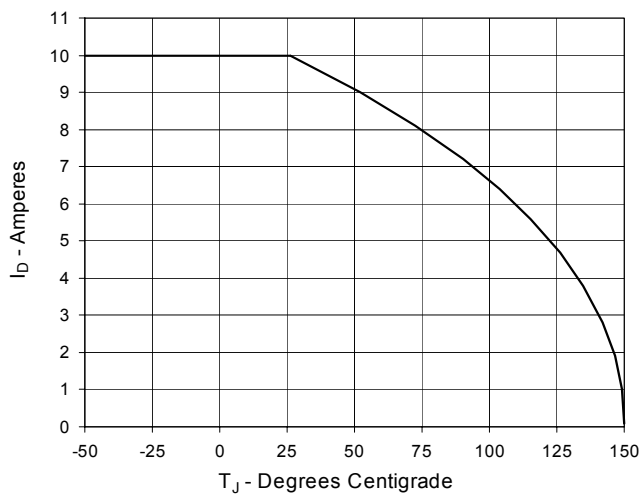


Fig. 6. Input Admittance

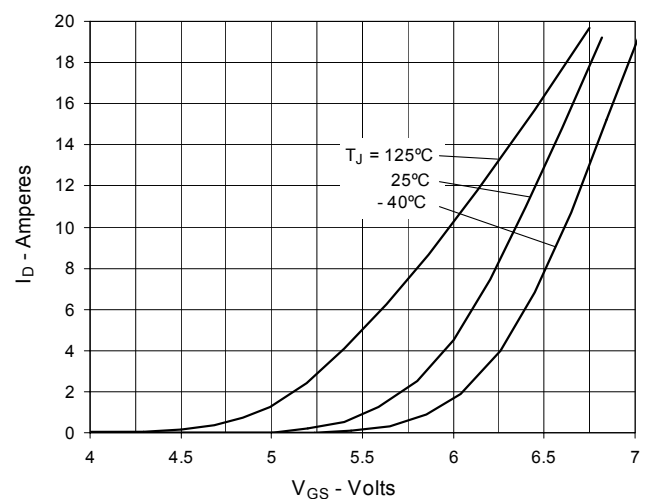
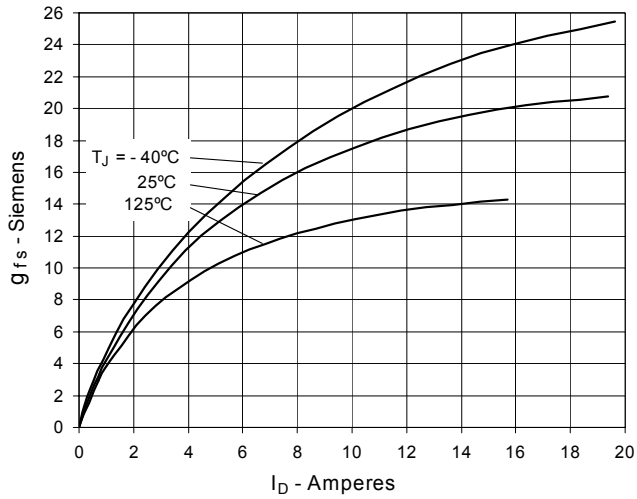
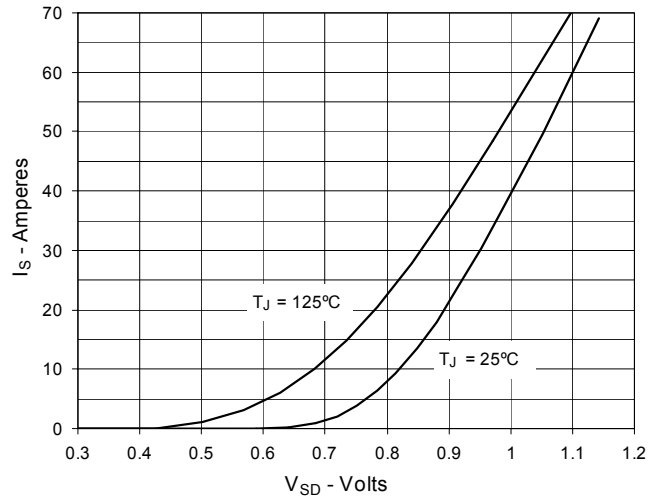
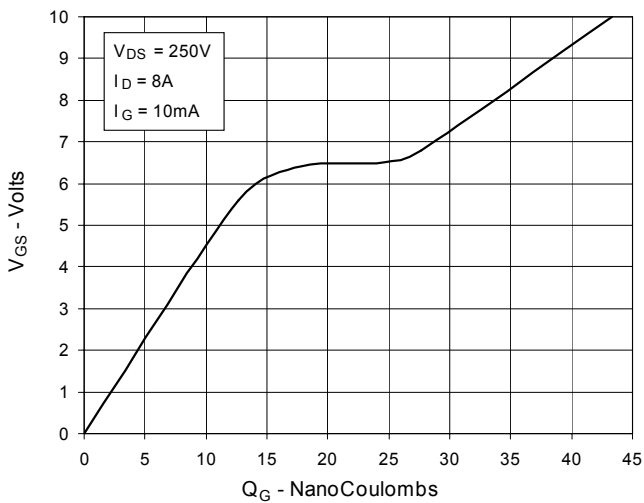
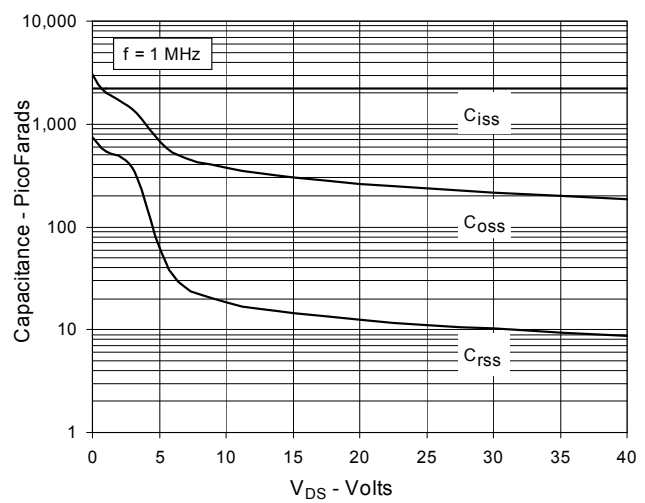
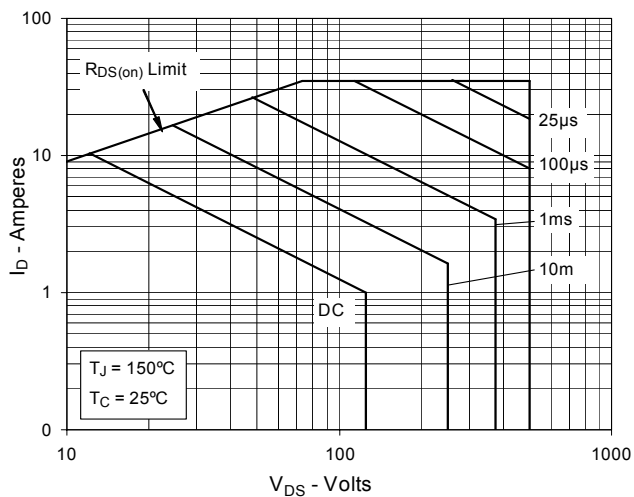


Fig. 7. Transconductance

Fig. 8. Forward Voltage Drop of Intrinsic Diode

Fig. 9. Gate Charge

Fig. 10. Capacitance

Fig. 11. Forward-Bias Safe Operating Area

Fig. 12. Maximum Transient Thermal Resistance
