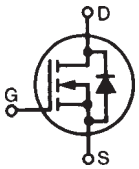
PolarHV™ HiPerFET Power MOSFET

IXFC 20N80P
IXFR 20N80P

V_{DSS} = 800 V
I_{D25} = 10 A
$R_{DS(on)}$ ≤ 500 mΩ
t_{rr} ≤ 250 ns

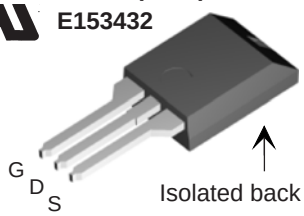
Electrically Isolated Back Surface

N-Channel Enhancement Mode
Fast Recovery Diode
Avalanche Rated

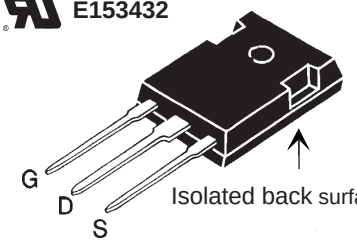


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	800	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	11	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	60	A
I_{AR}	T_C = 25°C	10	A
E_{AR}	T_C = 25°C	30	mJ
E_{AS}	T_C = 25°C	1.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/μs, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$, R_G = 3 Ω	10	V/ns
P_D	T_C = 25°C	166	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
V_{ISOL}	50/60 Hz, RMS, t = 1minute, leads-to-tab	2500	V~
F_C	Mounting Force (IXFC)	11..65 / 2.5..15	N/lb
	(IXFR)	20..120 / 4.5..25	N/lb
Weight	ISOPLUS220	2	g
	ISOPLUS247	5	g

ISOPLUS220™ (IXFC)
E153432



ISOPLUS247™ (IXFR)
E153432



G = Gate D = Drain
S = Source

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 = 4 mA	3.0		5.0	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			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			500	mΩ

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<30pF)

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages

- Easy assembly
- Space savings
- High power density

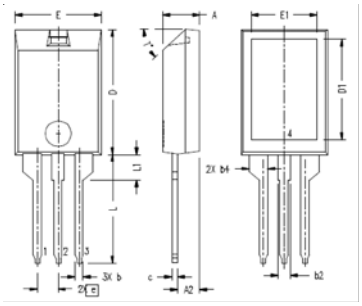
© 2006 IXYS All rights reserved
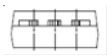
Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20 V; I_D = 10 A, pulse test	12	23		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		4680		pF
C_{oss}			360		pF
C_{rss}			28		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = V_{DSS}, I_D = 10 A R_G = 3 Ω (External)		22		ns
t_r			24		ns
$t_{d(off)}$			70		ns
t_f			25		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 10 A		85		nC
Q_{gs}			25		nC
Q_{gd}			27		nC
R_{thJC}				0.75	°C/W
R_{thCS}			0.21		°C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			20	A
I_{SM}	Repetitive			60	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 = 20A, -di/dt = 100 A/µs			250	ns
I_{RM}	V_R = 100 V; V_{GS} = 0 V		8		A
Q_{RM}			0.8		µC

ISOPLUS220 (IXFC) Outline



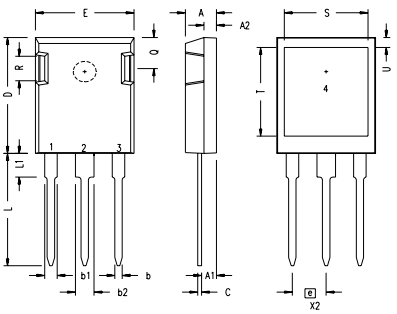


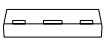
Note:
Bottom heatsink (Pin 4) is electrically isolated from Pin 1,2, or 3.

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°

IXYS CO 0177 R0

ISOPLUS247 (IXFR) Outline





SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

IXYS reserves the right to change limits, test conditions, and dimensions.

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 6,710,405B2 6,710,463 6,727,585 6,759,692 6,771,478 B2

Fig. 1. Output Characteristics @ 25°C

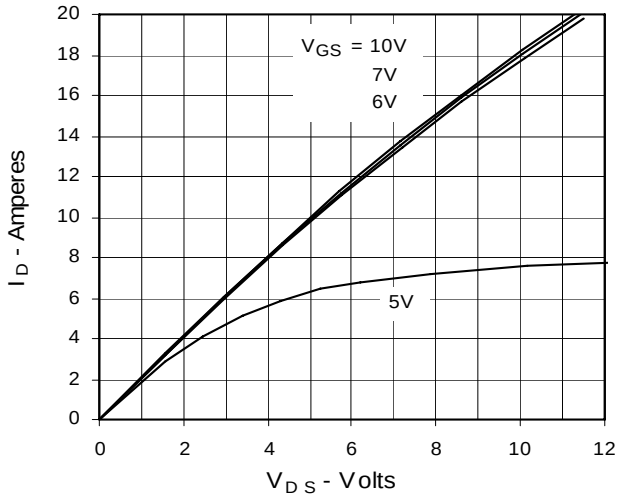


Fig. 2. Extended Output Characteristics @ 25°C

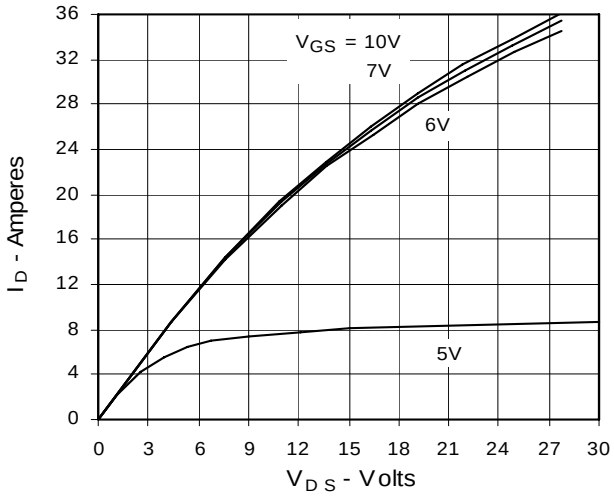


Fig. 3. Output Characteristics @ 125°C

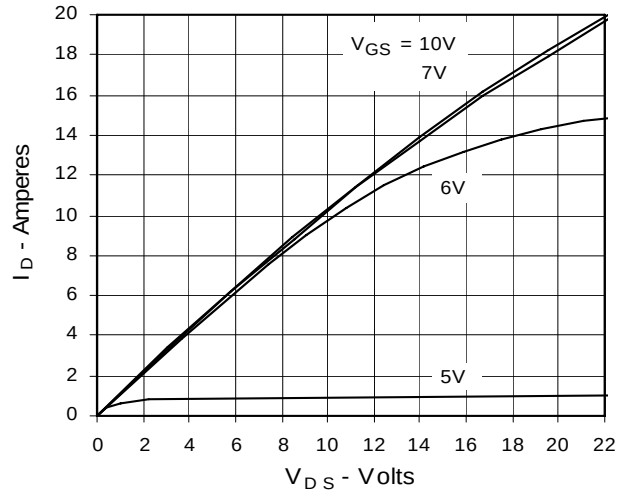


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 10A Value vs. Junction Temperature

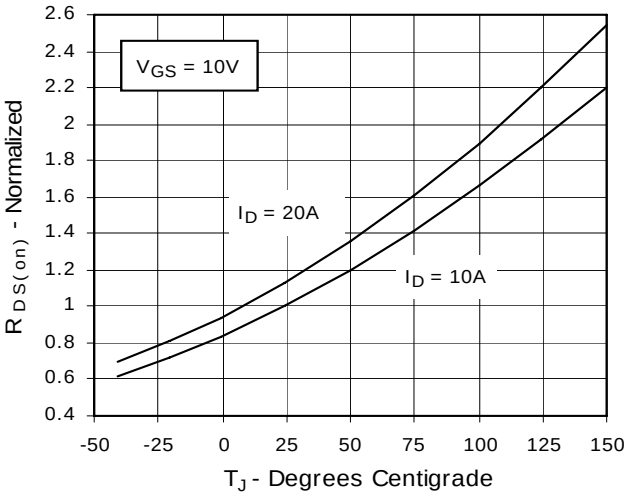


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 10A Value vs. Drain Current

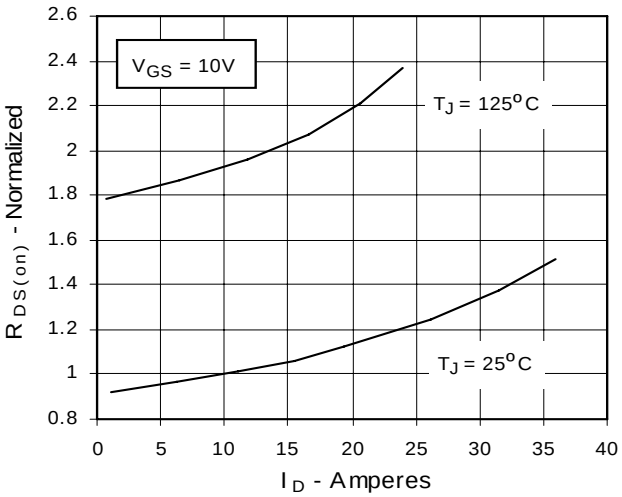
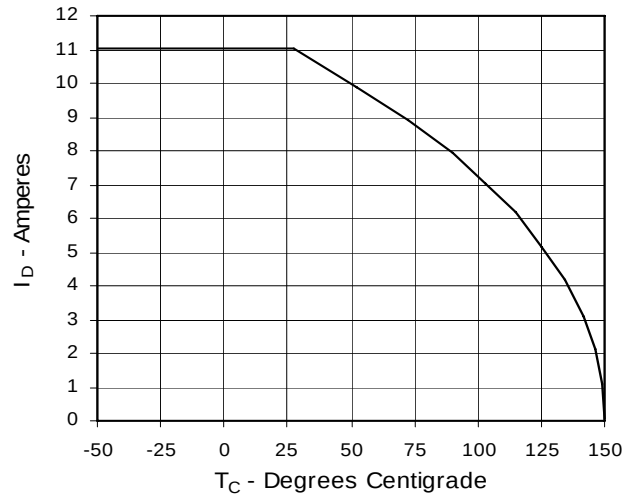


Fig. 6. Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

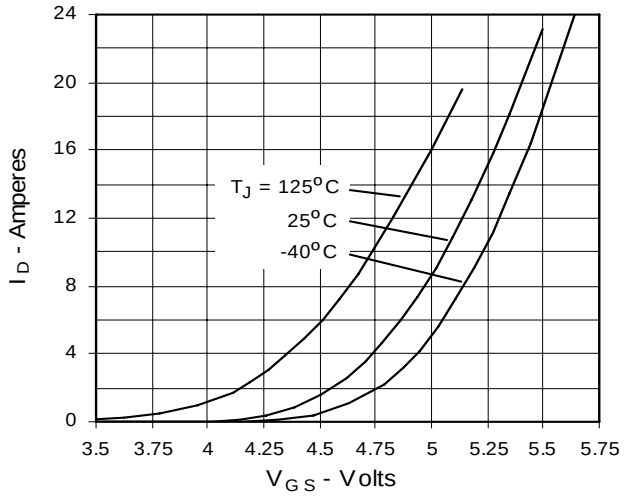


Fig. 8. Transconductance

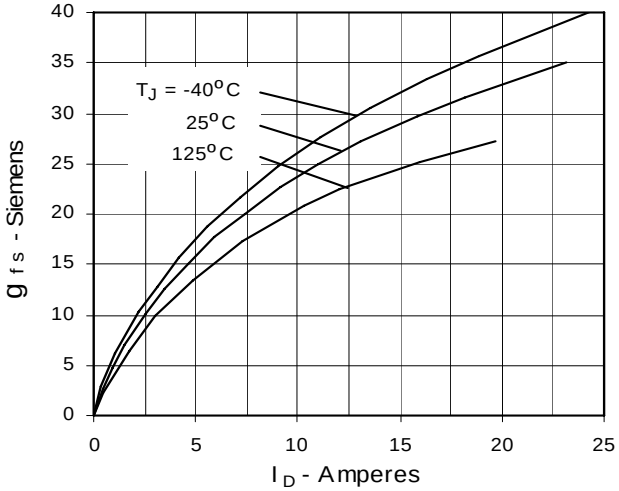


Fig. 9. Source Current vs. Source-To-Drain Voltage

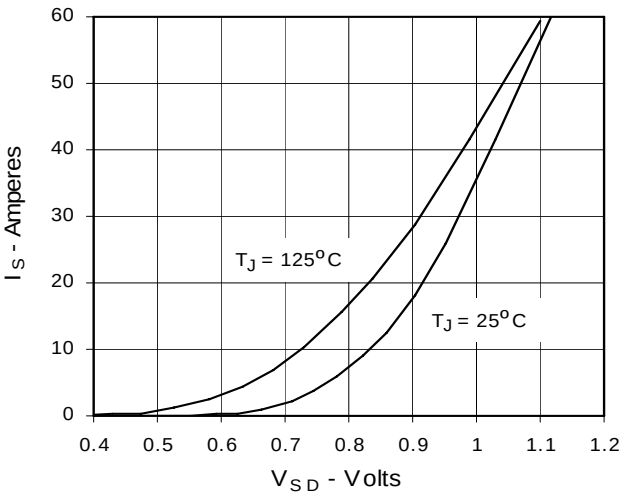


Fig. 10. Gate Charge

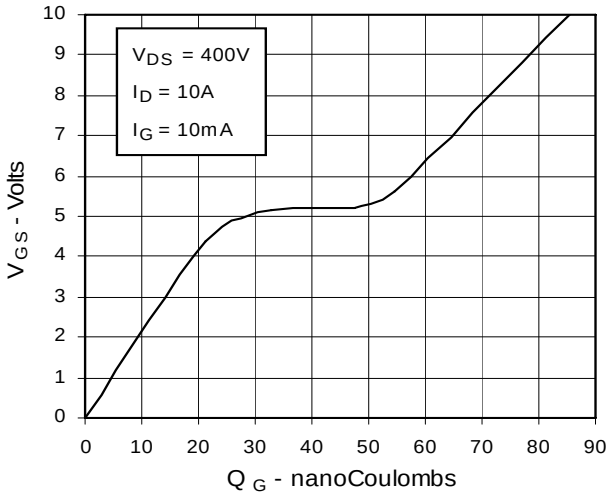


Fig. 11. Capacitance

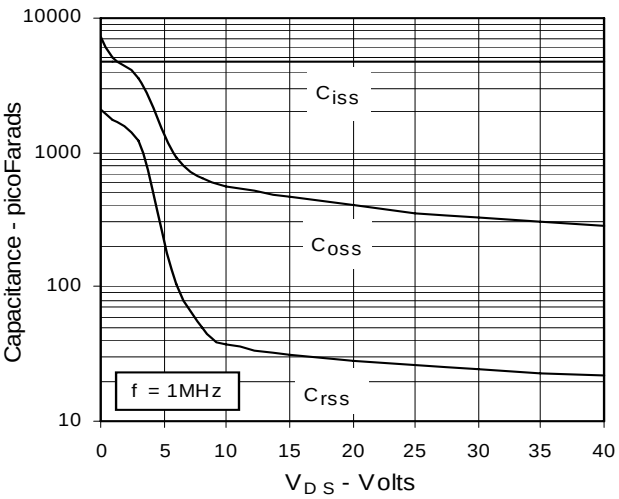
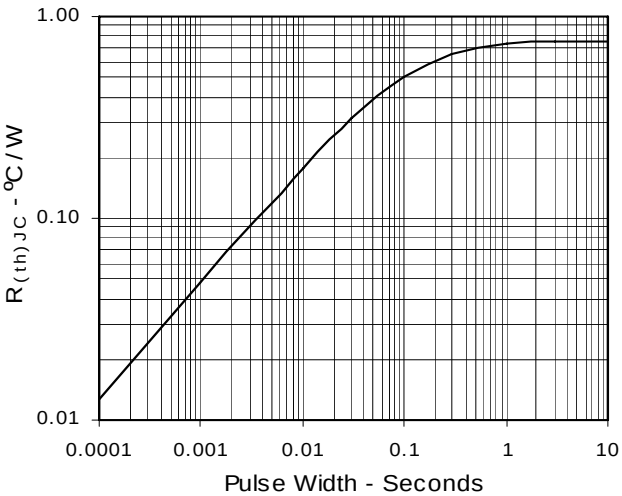


Fig. 12. Maximum Transient Thermal Resistance



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