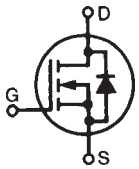
IXYS

PolarHV™ HiPerFET Power MOSFET ISOPLUS247™ IXFR 32N80P

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

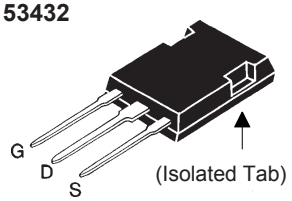
V_{DSS} = 800 V
I_{D25} = 20 A
$R_{DS(on)}$ ≤ 290 mΩ
t_{rr} ≤ 250 ns



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	20	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	70	A
I_{AR}	T_C = 25° C	16	A
E_{AR}	T_C = 25° C	50	mJ
E_{AS}	T_C = 25° C	1.5	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, T_J ≤150° C, R_G = 4 Ω	10	V/ns
P_D	T_C = 25° C	300	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
F_C	Mounting force	20..120/4.5..26	N/lb
V_{ISOL}	50/60 Hz, RMS t = 1 minute	2500	V~
Weight		5	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 = 8 mA	3.0		5.0	V
I_{GSS}	V_{GS} = ±30 V_{DC}, V_{DS} = 0			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			25	μA
	T_J = 125° C			1000	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$, Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			290	mΩ

ISOPLUS247 (IXFR)
E153432



G = Gate D = Drain
S = Source

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<30pF)
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Rated for Unclamped Inductive Load Switching (UIS)
- Fast intrinsic Rectifier

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

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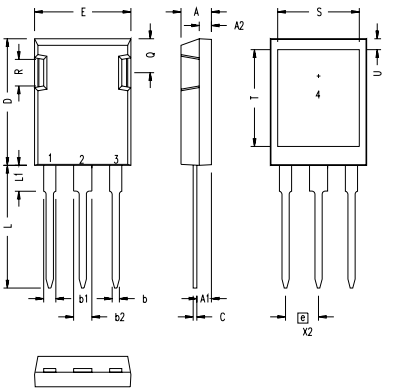
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20 V; I_D = I_T, pulse test	23	38		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		8800		pF
C_{oss}			700		pF
C_{rss}			26		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D =0.5 I_{D25} R_G = 2 Ω (External)		30		ns
t_r			24		ns
$t_{d(off)}$			85		ns
t_f			24		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = I_T		150		nC
Q_{gs}			40		nC
Q_{gd}			44		nC
R_{thJC}				0.42	°C/W
R_{thCs}			0.15		°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			32	A
I_{SM}	Repetitive			70	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 = 25A, -di/dt = 100 A/µs			250	ns
Q_{RM}	V_R = 100V		0.8		µC
I_{RM}			6.0		A

Note: Test current I_T = 16A

ISOPLUS 247 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 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405B2 6,759,692 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2

Fig. 1. Output Characteristics @ 25°C

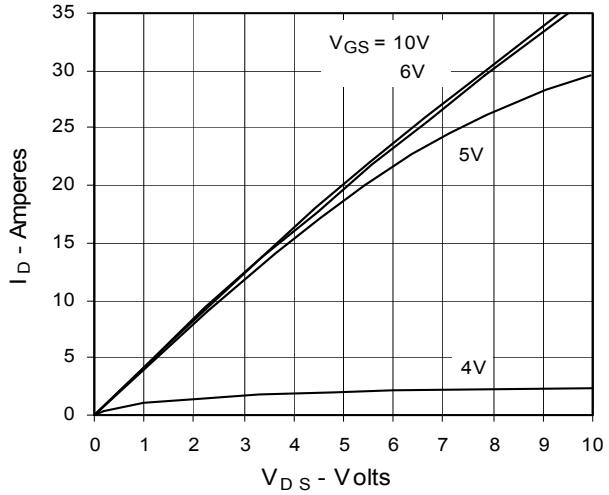


Fig. 2. Extended Output Characteristics @ 25°C

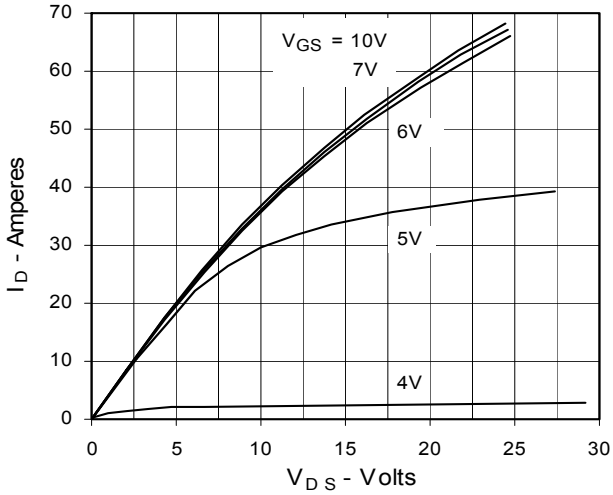


Fig. 3. Output Characteristics @ 125°C

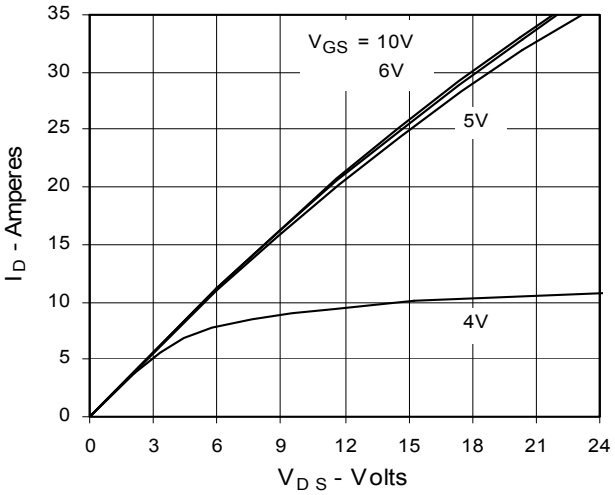


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 16A Value vs. Junction Temperature

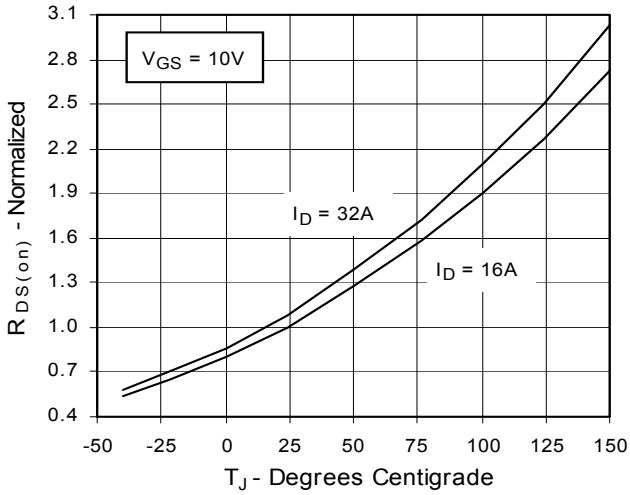


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 16A Value vs. Drain Current

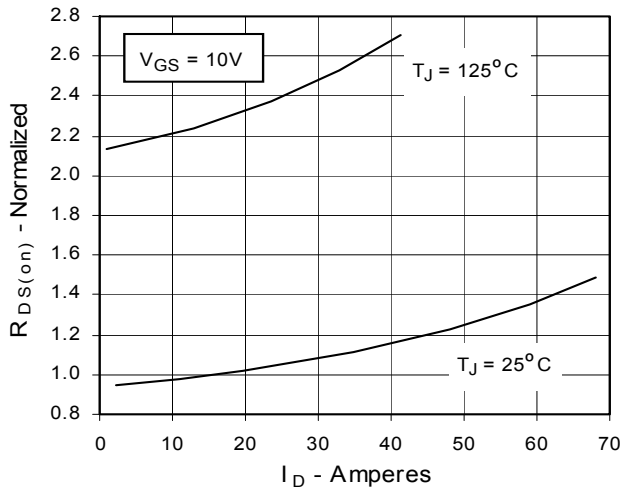


Fig. 6. Drain Current vs. Case Temperature

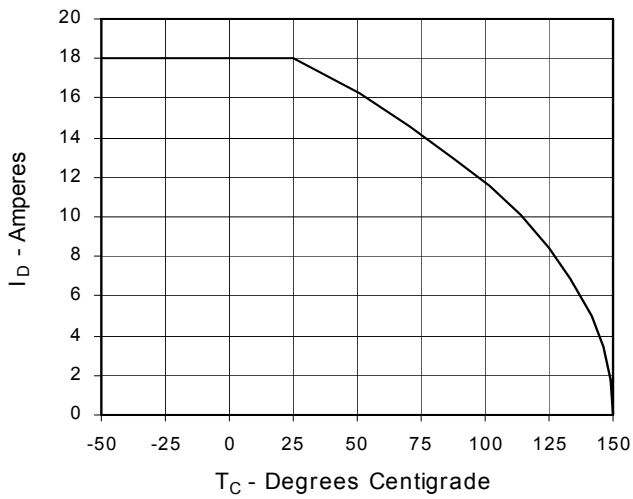


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Fig. 7. Input Admittance

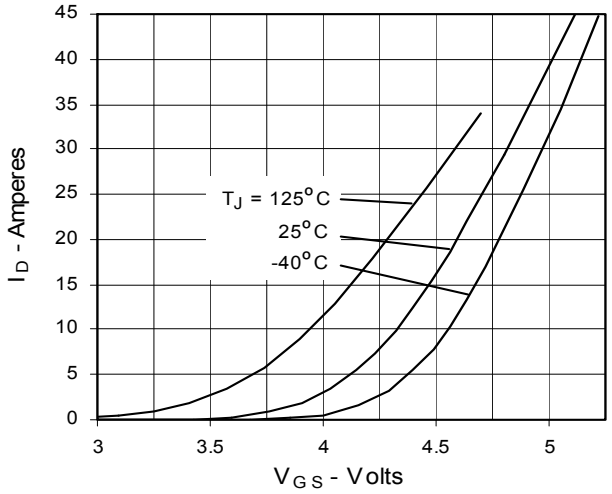

Fig. 8. Transconductance

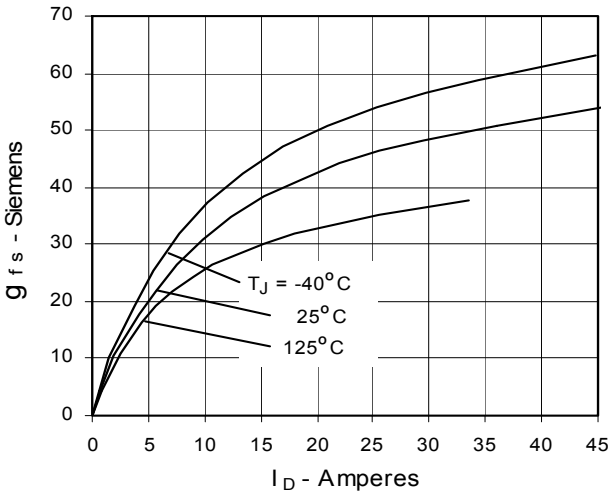

Fig. 9. Source Current vs. Source-To-Drain Voltage

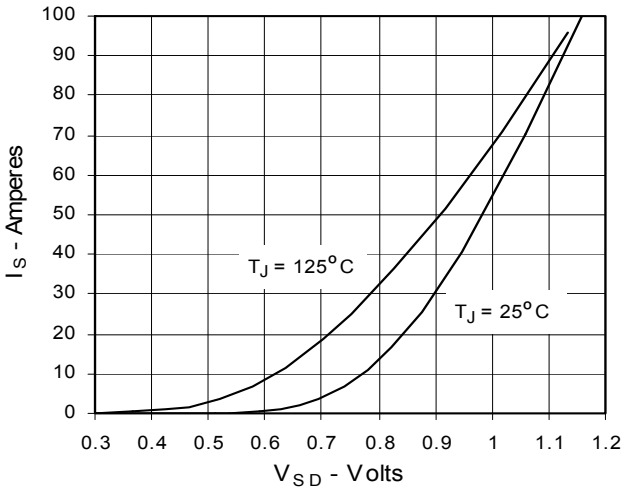

Fig. 10. Gate Charge

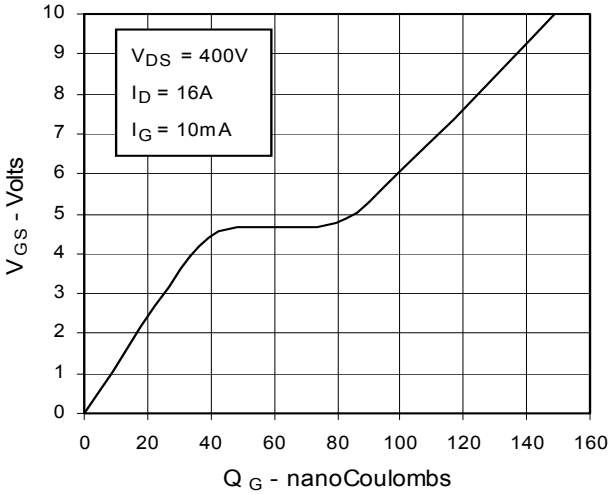

Fig. 11. Capacitance

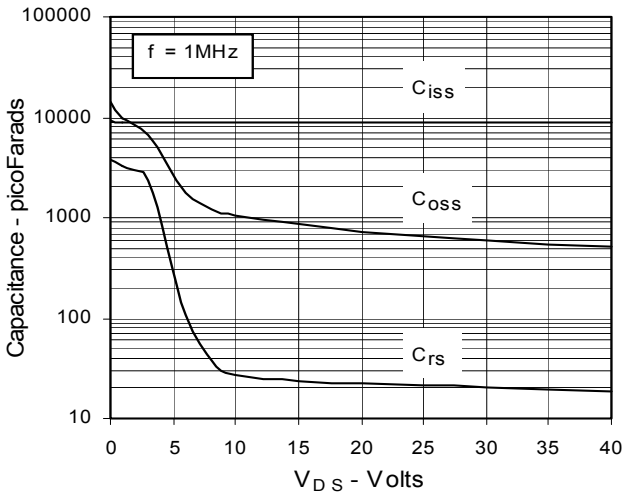

Fig. 12. Maximum Transient Thermal Resistance

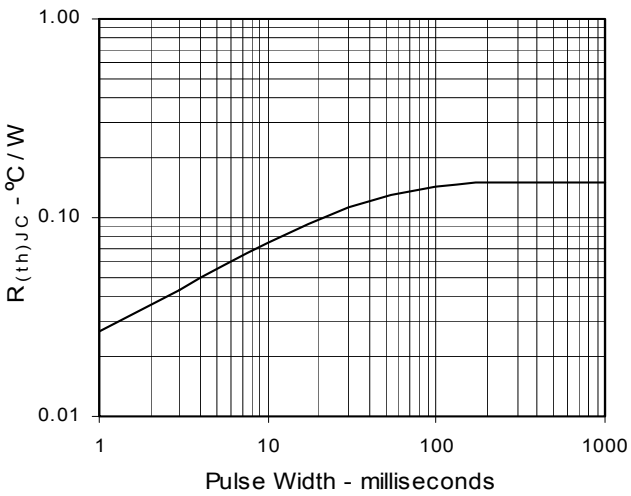

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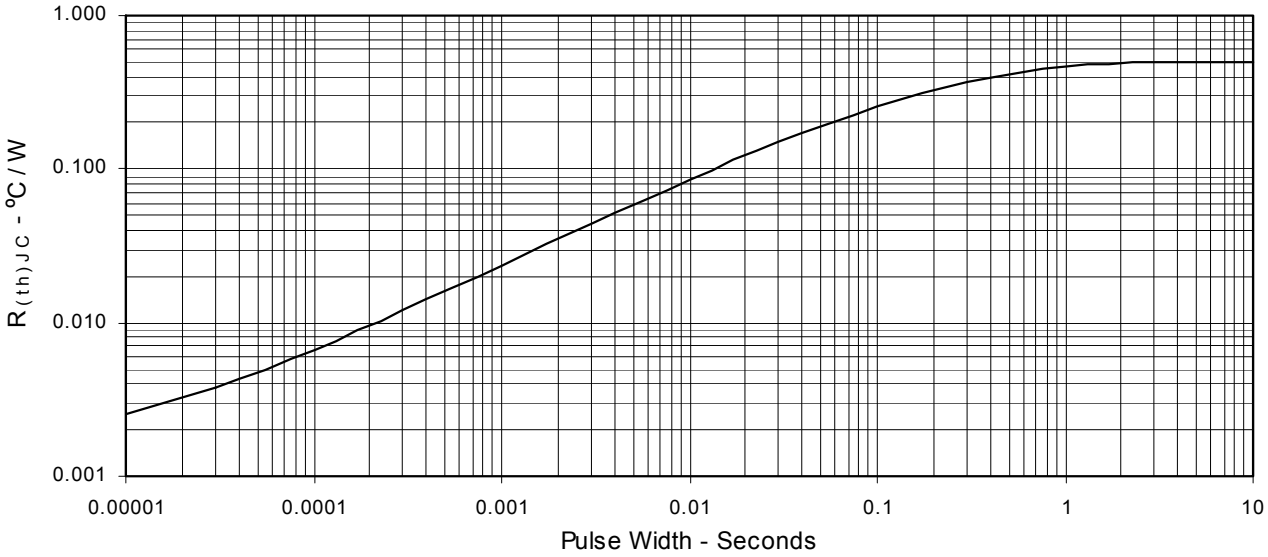
Fig. 13. Maximum Transient Thermal Resistance



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