IXYS

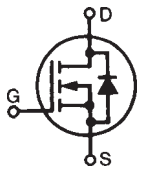
Polar™ HiperFET™ Power MOSFET

IXFR16N120P

V_{DSS} = 1200V
I_{D25} = 9A
$R_{DS(on)}$ ≤ 1.04Ω
t_{rr} ≤ 300ns

(Electrically Isolated Tab)

N-Channel Enhancement Mode
Fast Intrinsic Rectifier



ISOPLUS247
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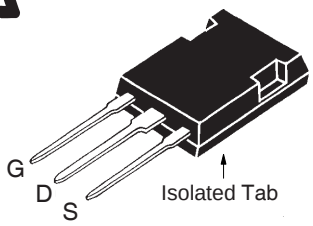


G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	1200	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	1200	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	9	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	35	A
I_A	T_C = 25°C	8	A
E_{AS}	T_C = 25°C	800	mJ
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	15	V/ns
P_D	T_C = 25°C	230	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
V_{ISOL}	50/60 Hz, 1 Minute	2500	V~
F_C	Mounting Force	20..120/4.5..27	N/lb.
Weight		5	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	1200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 1mA	3.5		6.5	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			25	μA
	T_J = 125°C			2.5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 8A, Note 1			1.04	Ω

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- Low Intrinsic Gate Resistance
- 2500V~ Electrical Isolation
- International Standard Packages
- Fast Recovery Diode
- Avalanche Rated
- Low Package Inductance

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- High Voltage Switch-mode and Resonant-Mode Power Supplies
- High Voltage Pulse Power Applications
- High Voltage Discharge Circuits in Lasers Pulsers, Spark Igniters, RF Generators
- High Voltage DC-DC converters
- High Voltage DC-AC inverters

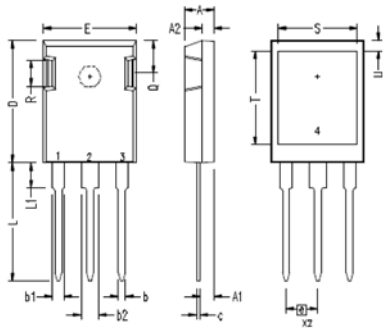
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 8A, Note 1	11	17		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		6900		pF
C_{oss}			390		pF
C_{rss}			48		pF
R_{Gi}	Gate Input Resistance		1.4		Ω
$t_{d(on)}$	**Resistive Switching Times**		35		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 8A		28		ns
$t_{d(off)}$	R_G = 2Ω (External)		66		ns
t_f			35		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 8A		120		nC
Q_{gs}			37		nC
Q_{gd}			47		nC
R_{thJC}				0.54	°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} = 0V			16	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			64	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 8A, -di/dt = 100A/μs			300	ns
I_{RM}	V_R = 100V, V_{GS} = 0V		7.5		A
Q_{RM}			0.75		μC

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

ISOPLUS247 (IXFR) Outline



1 = Gate
2,4 = Drain
3 = Source

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	.085	1.91	2.15
b2	.115	.126	2.92	3.20
C	.024	.033	0.61	0.83
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.811	19.81	20.60
L1	.150	.172	3.81	4.38
Q	.220	.244	5.59	6.20
R	.170	.191	4.32	4.85
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03
W	0	.004	0	0.10

Fig. 1. Output Characteristics T_J = @ 25ºC

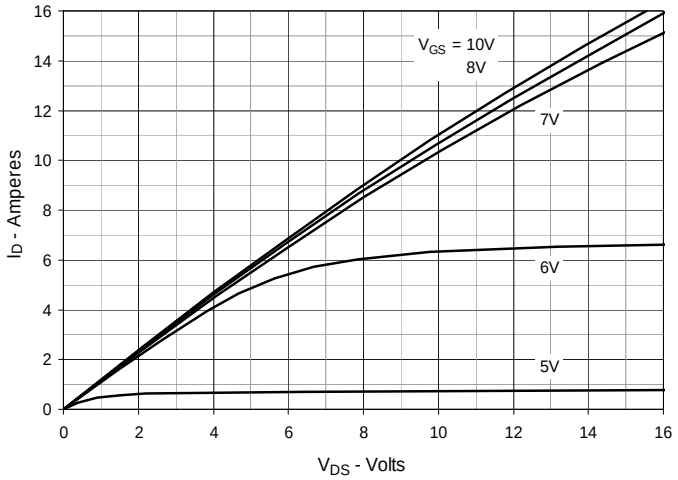


Fig. 2. Extended Output Characteristics T_J = @ 25ºC

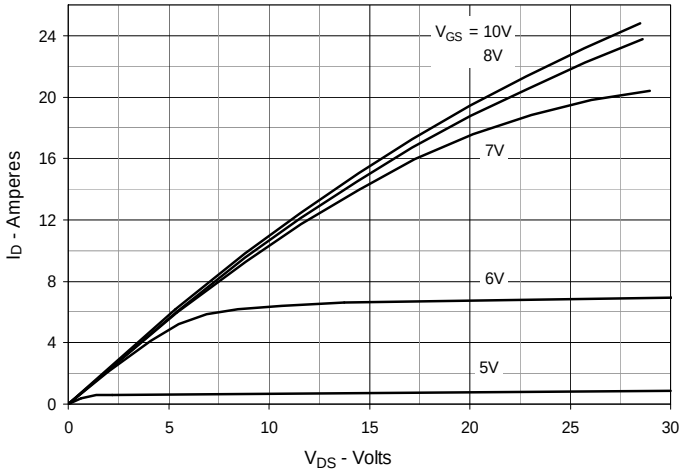


Fig. 3. Output Characteristics T_J = @ 125ºC

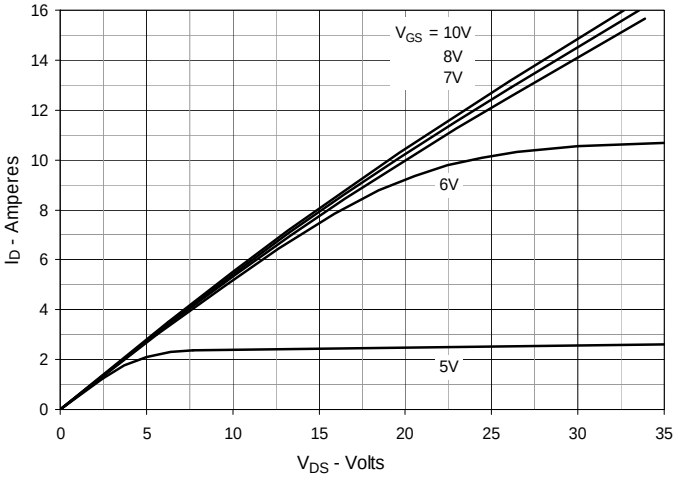


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 8A Value vs. Junction Temperature

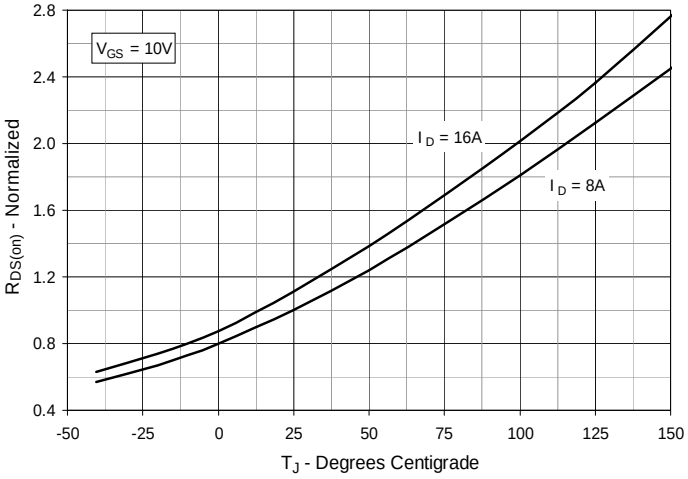


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 8A Value vs. Drain Current

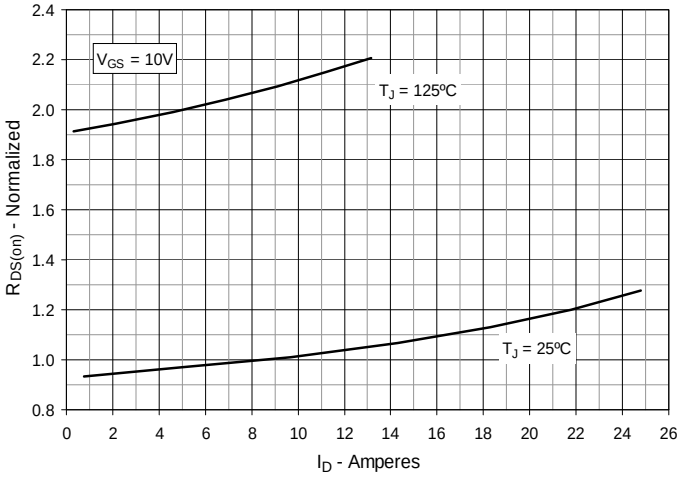


Fig. 6. Maximum Drain Current vs. Case Temperature

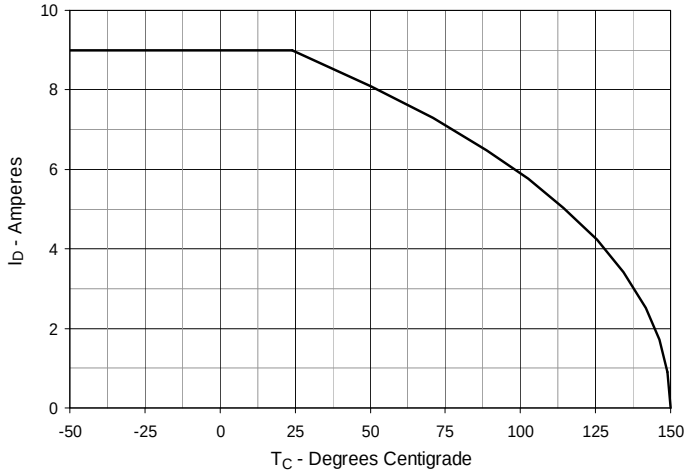


Fig. 7. Input Admittance

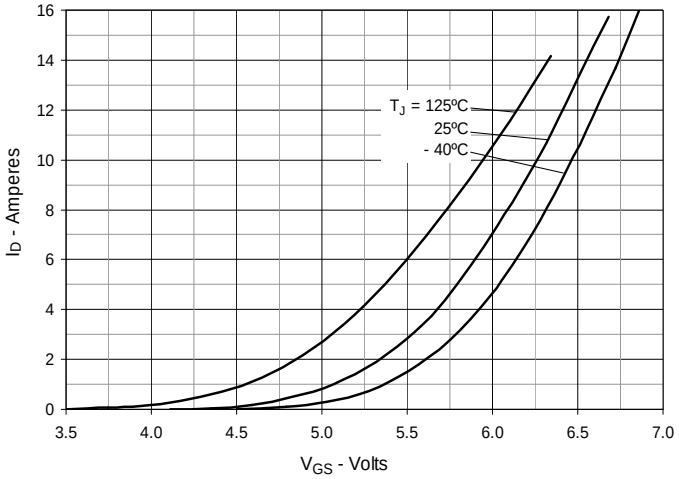


Fig. 8. Transconductance

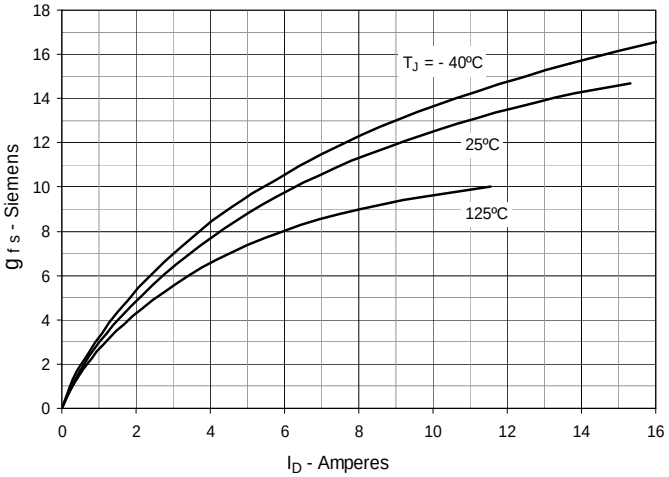


Fig. 9. Forward Voltage Drop of Intrinsic Diode

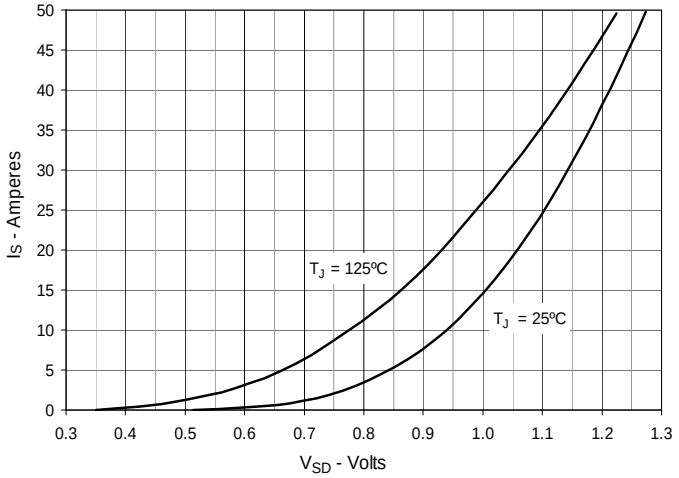


Fig. 10. Gate Charge

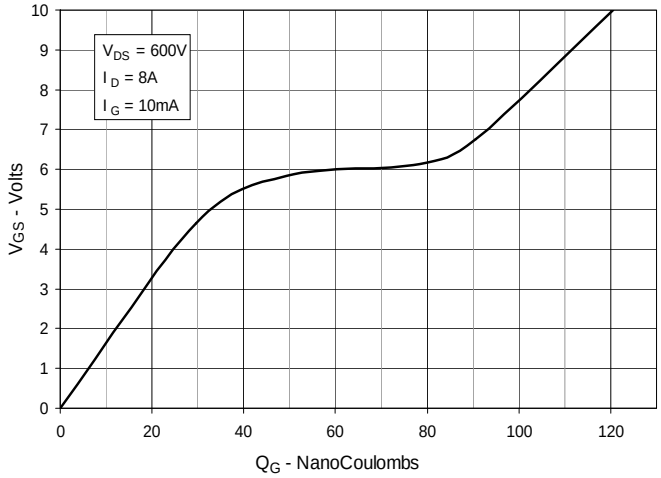


Fig. 11. Capacitance

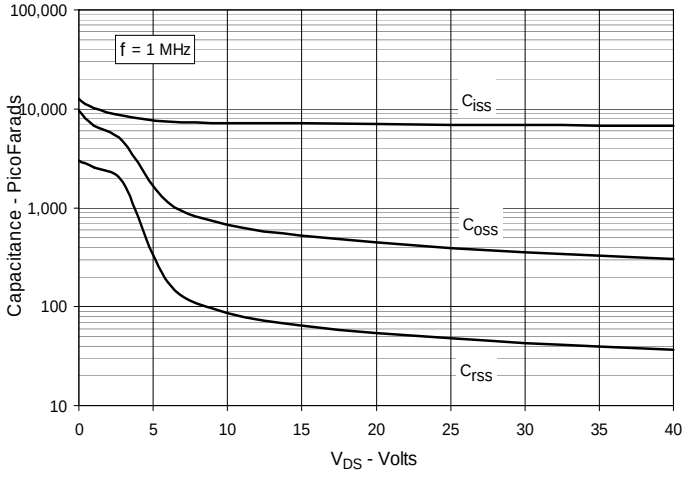


Fig. 12. Breakdown and Threshold Voltages vs. Junction Temperature

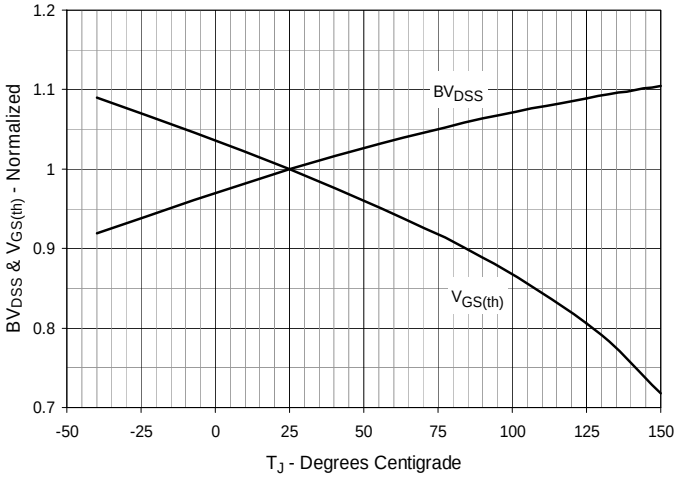
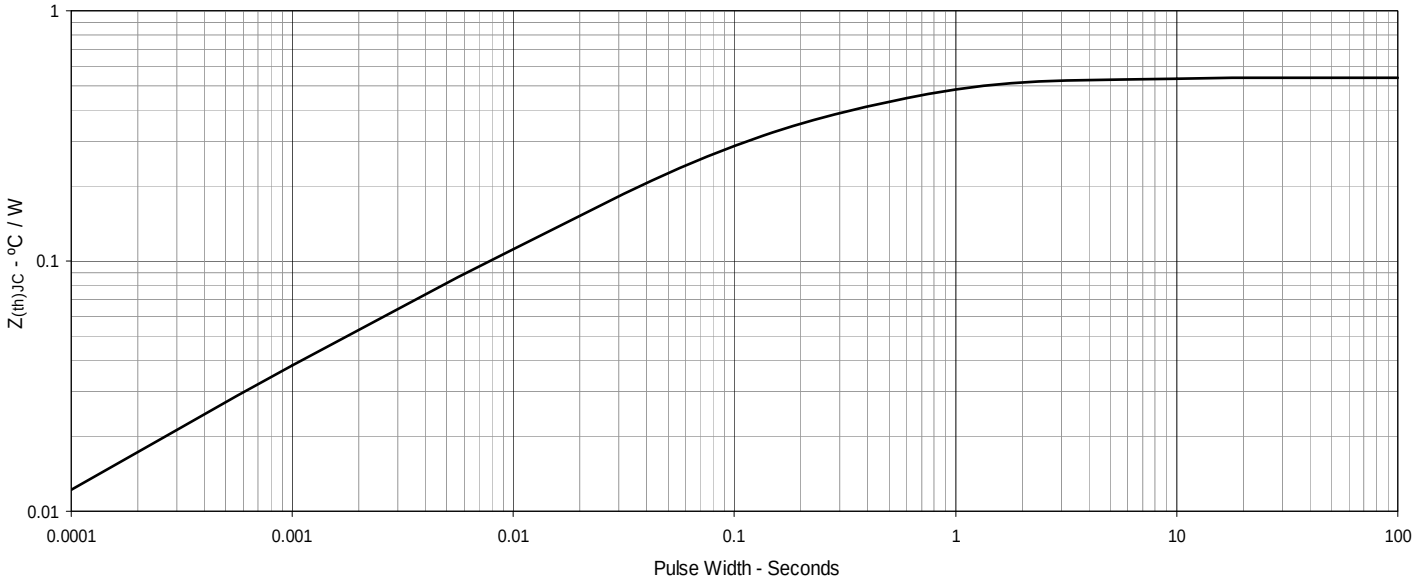


Fig. 13. Maximum Transient Thermal Impedance



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