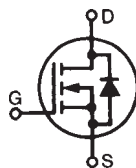


Polar™ HiperFET™ Power MOSFET

IXFR16N120P

(Electrically Isolated Tab)

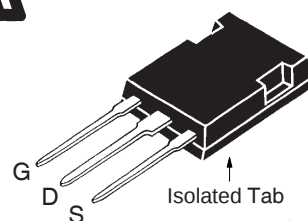
N-Channel Enhancement Mode
Fast Intrinsic Rectifier



$$\begin{aligned} V_{DSS} &= 1200V \\ I_{D25} &= 9A \\ R_{DS(on)} &\leq 1.04\Omega \\ t_{rr} &\leq 300ns \end{aligned}$$

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

ISOPLUS247
E153432



G = Gate D = Drain
S = Source

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 ($T_J = 25^\circ\text{C}$ 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}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			25 μA 2.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 8A$, Note 1			1.04 Ω

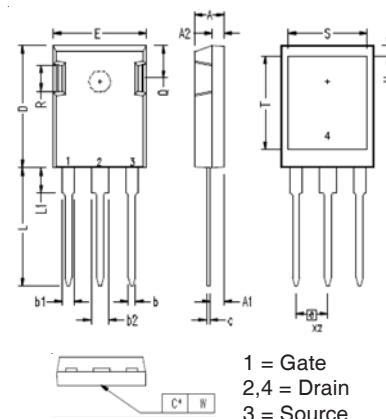
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{V}$, $I_D = 8\text{A}$, Note 1	11	17	S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		6900	pF
C_{oss}			390	pF
C_{rss}			48	pF
R_{Gi}	Gate Input Resistance		1.4	Ω
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 8\text{A}$ $R_G = 2\Omega$ (External)		35	ns
t_r			28	ns
$t_{d(off)}$			66	ns
t_f			35	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 8\text{A}$		120	nC
Q_{gs}			37	nC
Q_{gd}			47	nC
R_{thJC}				0.54 $^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			16 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			64 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 8\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$, $V_{GS} = 0\text{V}$			300 ns
I_{RM}			7.5	A
Q_{RM}			0.75	μC

Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

ISOPLUS247 (IXFR) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of 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	7,005,734 B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	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	7,071,537	

Fig. 1. Output Characteristics $T_J = @ 25^\circ\text{C}$

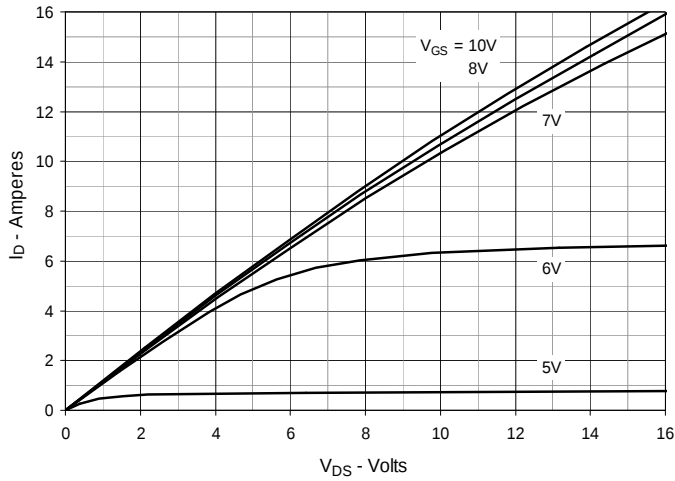


Fig. 2. Extended Output Characteristics $T_J = @ 25^\circ\text{C}$

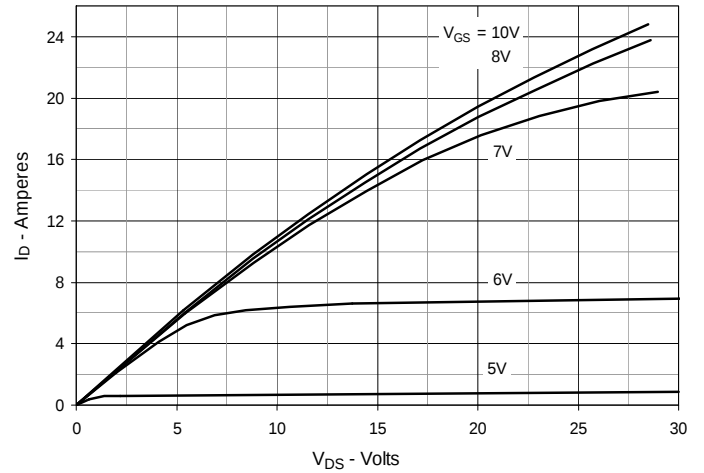


Fig. 3. Output Characteristics $T_J = @ 125^\circ\text{C}$

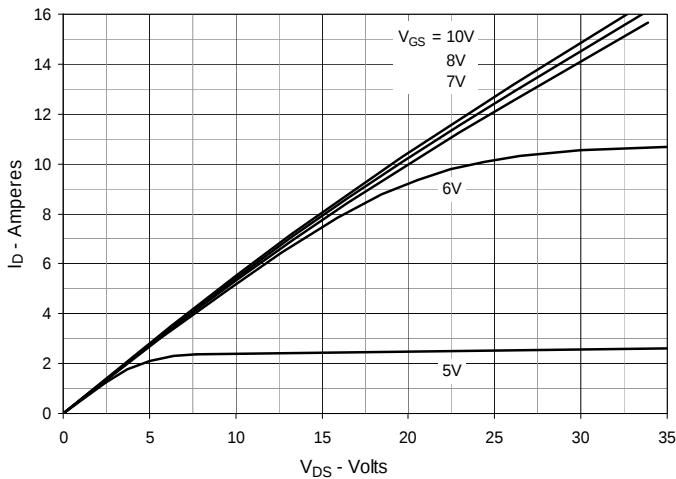


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 8\text{A}$ Value vs. Junction Temperature

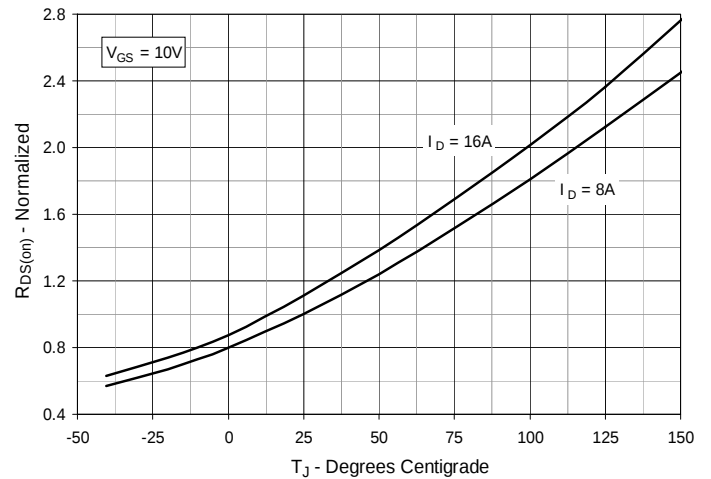


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 8\text{A}$ Value vs. Drain Current

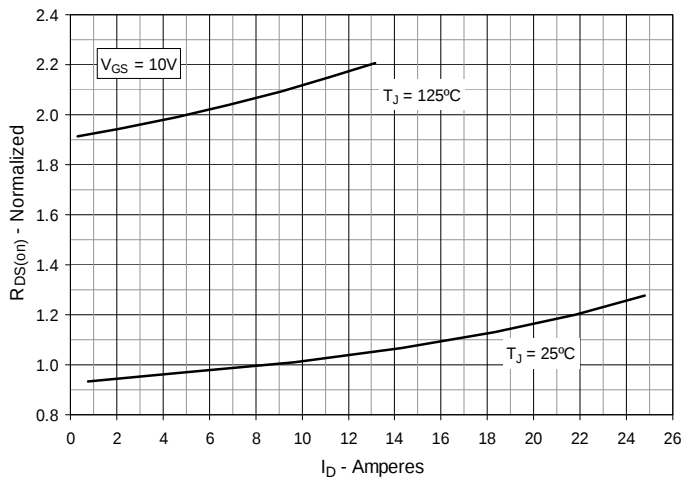


Fig. 6. Maximum Drain Current vs. Case Temperature

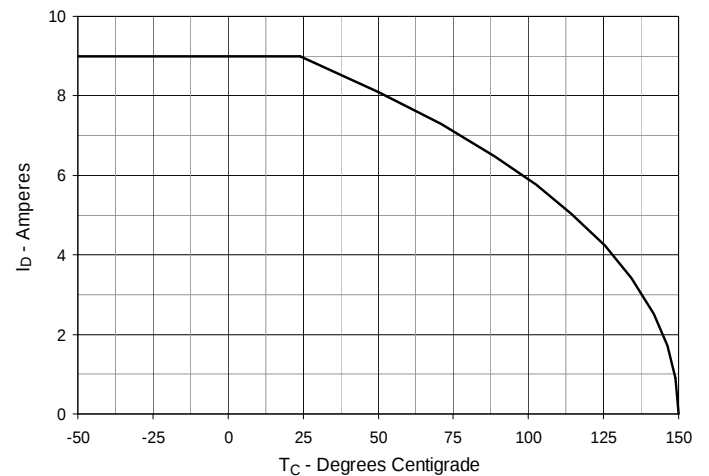


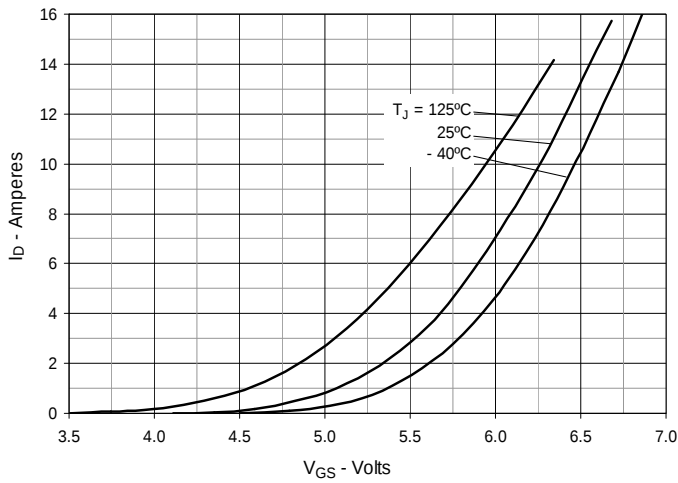
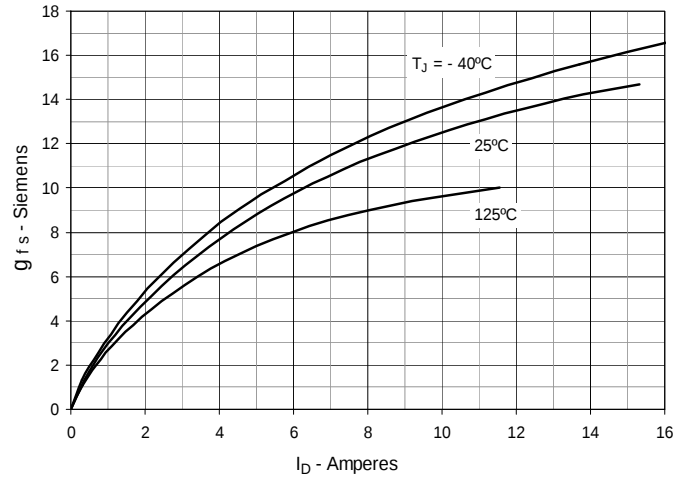
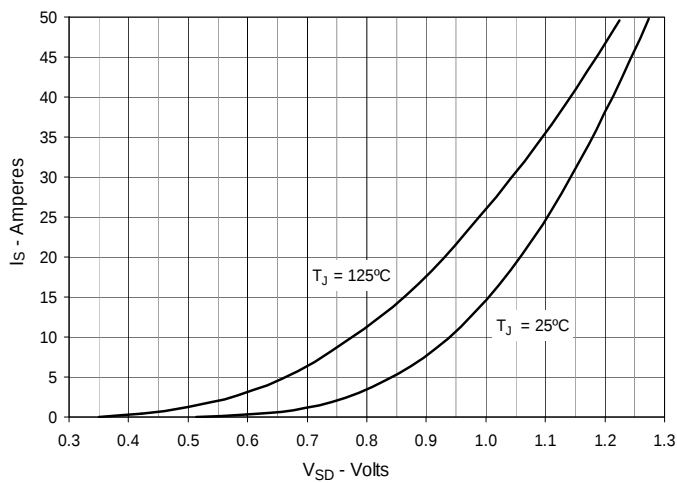
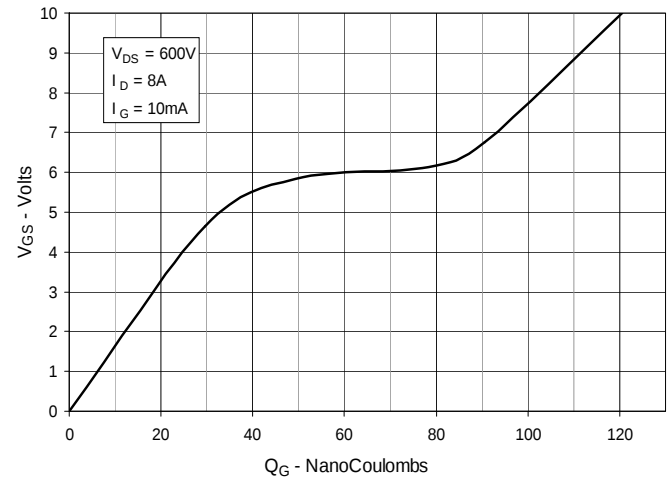
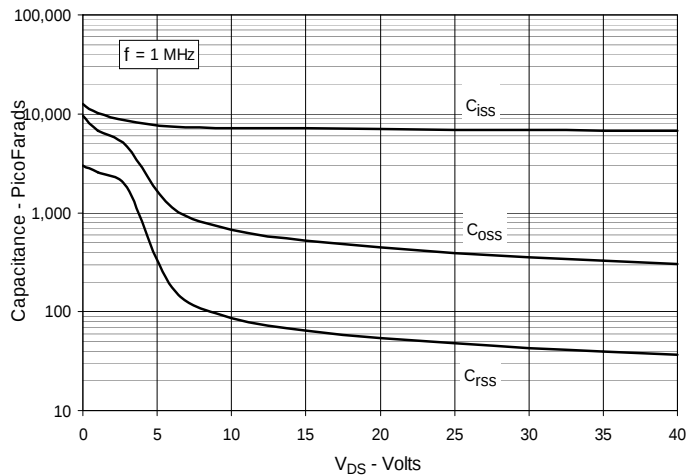
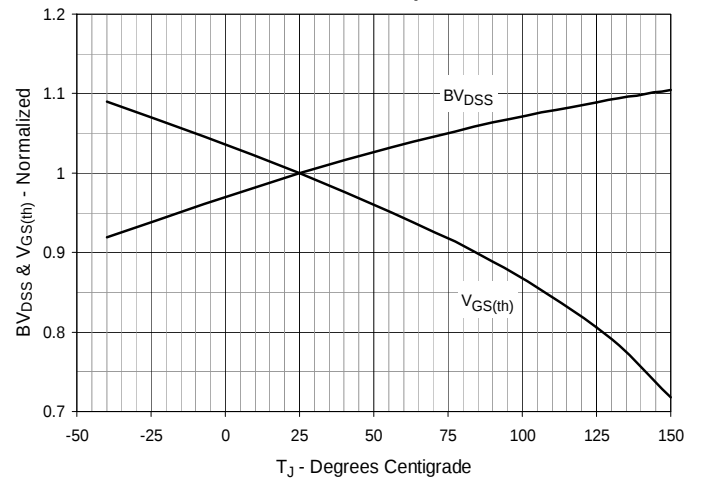
Fig. 7. Input Admittance

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

