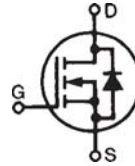


High Voltage HiPerFET Power MOSFET

IXFH 12N120

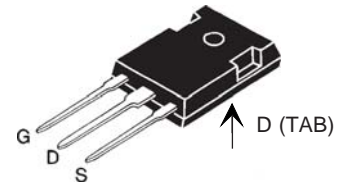
$$\begin{aligned} V_{DSS} &= 1200 \text{ V} \\ I_{D(\text{cont})} &= 12 \text{ A} \\ R_{DS(\text{on})} &= 1.4 \Omega \\ t_{rr} &\leq 300 \text{ ns} \end{aligned}$$

Preliminary Data Sheet



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 ; $R_{GS} = 1 \text{ M}\Omega$	1200	V
V_{GS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	12	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	48	A
I_{AR}		12	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	1.0	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	500	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		6	g
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$

TO-247 AD



G = Gate, D = Drain,
S = Source, TAB = Drain

Features

- International standard package JEDEC TO-247 AD
- Low $R_{DS(\text{on})}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Fast switching times

Applications

- Switch-mode and resonant-mode power supplies
- Motor controls
- Uninterruptible Power Supplies (UPS)
- DC choppers

Advantages

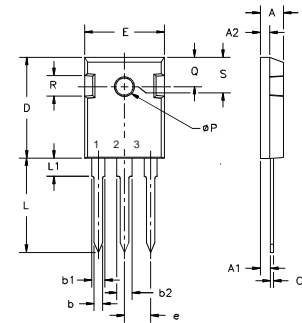
- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ mA}$	1200		V
$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	3		V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0 \text{ V}$, $T_J = 125^\circ\text{C}$			50 μA 3 mA
$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$			1.4 Ω

Symbol	Test Conditions	Characteristic Values			
		(T _J = 25°C, unless otherwise specified)			
		min.	typ.	max.	
g_{fs}	$V_{DS} = 20\text{ V}; I_D = 0.5 I_{D25}$, pulse test	6	10		S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		3400		pF
C_{oss}			280		pF
C_{rss}			105		pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, 0.5 I_{D25}$ $R_G = 1.5\ \Omega$ (External)		24		ns
t_r			25		ns
$t_{d(off)}$			35		ns
t_f			17		ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$		95		nC
Q_{gs}			22		nC
Q_{gd}			50		nC
R_{thJC}				0.25	K/W
R_{thCK}			0.25		K/W

Symbol	Test Conditions	Characteristic Values			
		(T _J = 25°C, unless otherwise specified)			
		min.	typ.	max.	
I_s	$V_{GS} = 0\text{ V}$			12	A
I_{SM}	Repetitive; pulse width limited by T _{JM}			48	A
V_{SD}	$I_F = I_s, V_{GS} = 0\text{ V}$, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.5	V
t_{rr}	$I_F = I_s, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			300	ns
I_{RM}			6.0		A
Q_{RM}			1.2		μC

TO-247 AD Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	.242	BSC

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:

4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505
4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1	6,259,123B1	6,306,728B1	6,683,344

Fig. 1. Output Characteristics @ 25°C

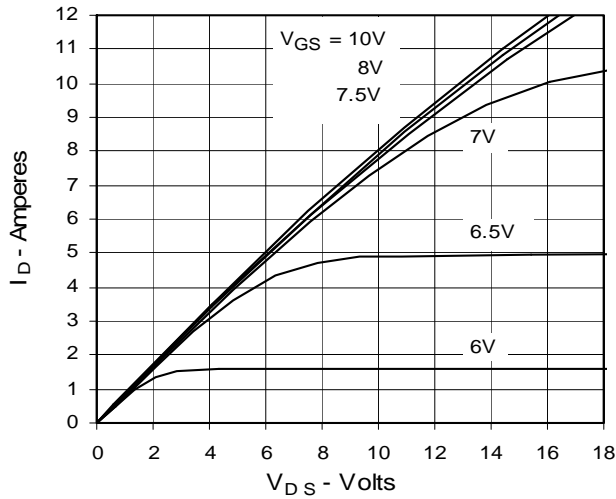


Fig. 2. Extended Output Characteristics @ 25°C

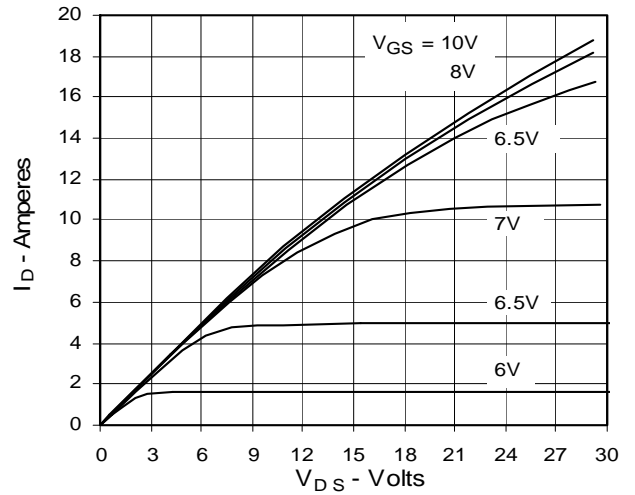


Fig. 3. Output Characteristics @ 125°C

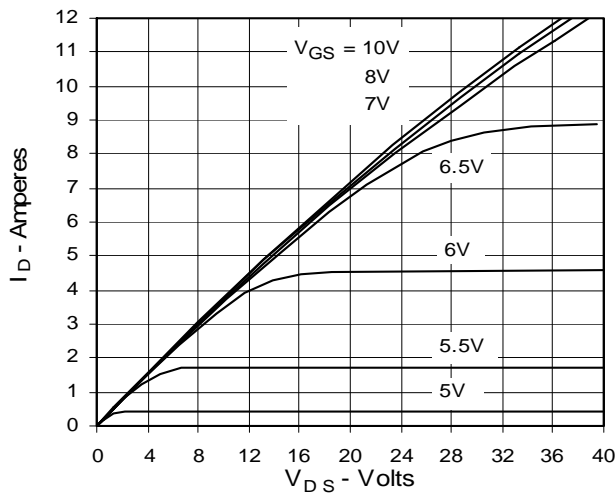


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

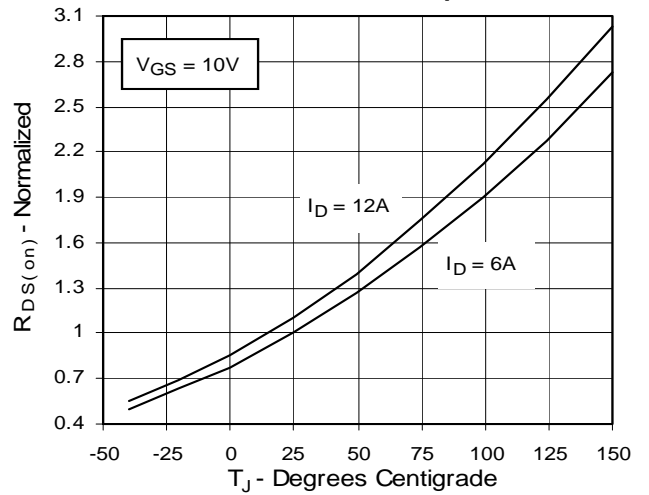


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

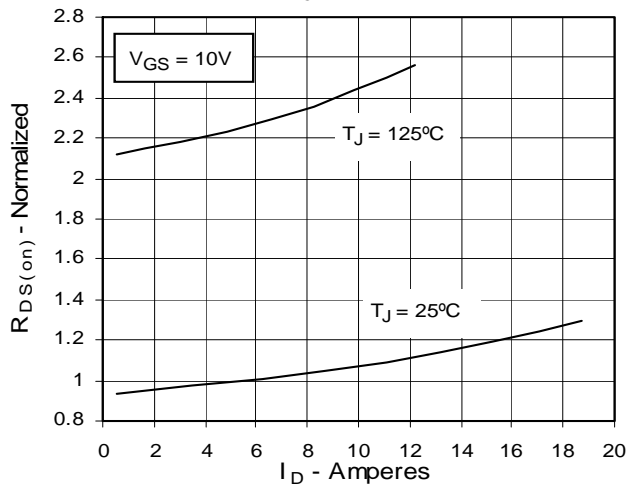


Fig. 6. Drain Current vs. Case Temperature

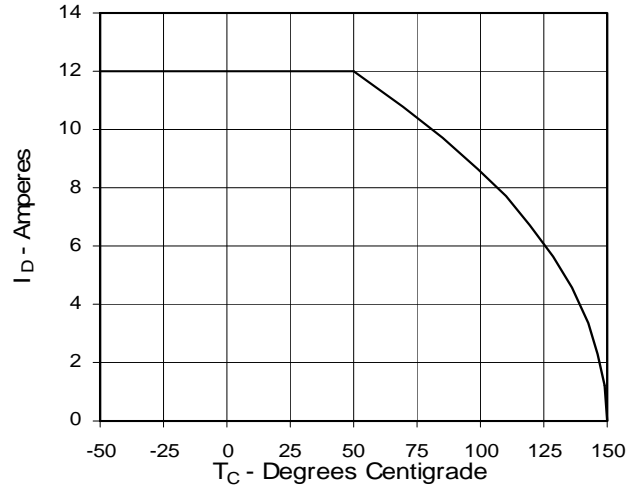


Fig. 7. Input Admittance

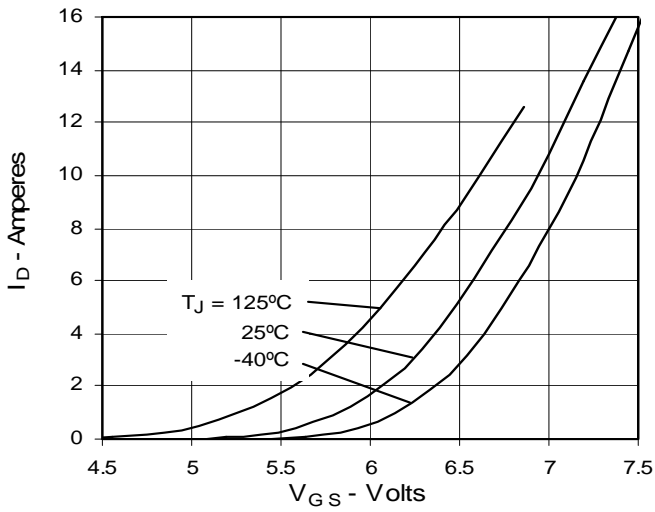


Fig. 8. Transconductance

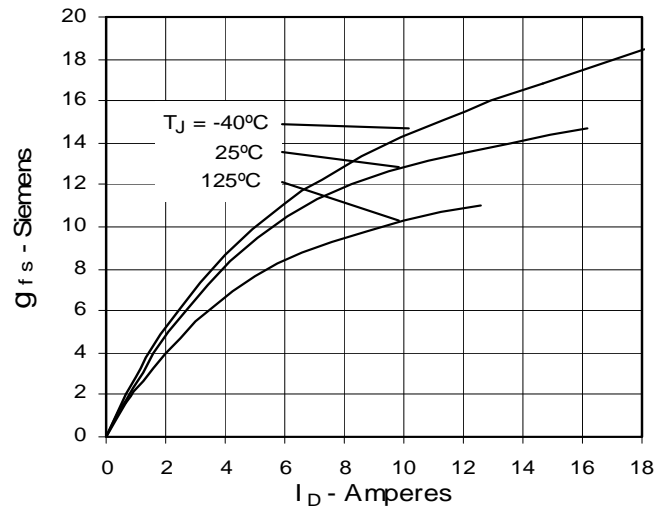


Fig. 9. Source Current vs. Source-To-Drain Voltage

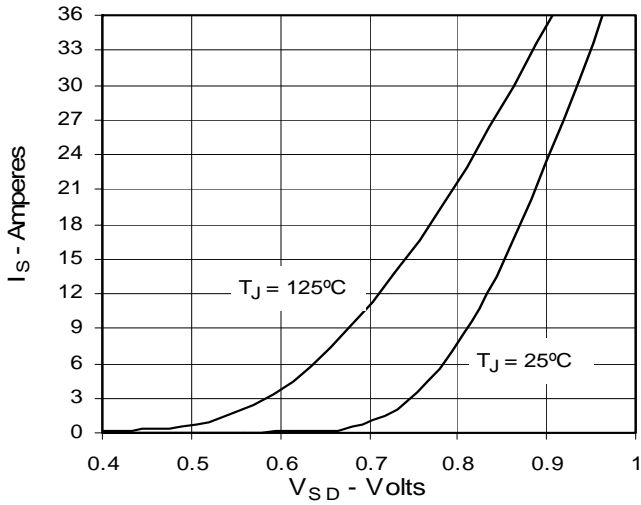


Fig. 10. Gate Charge

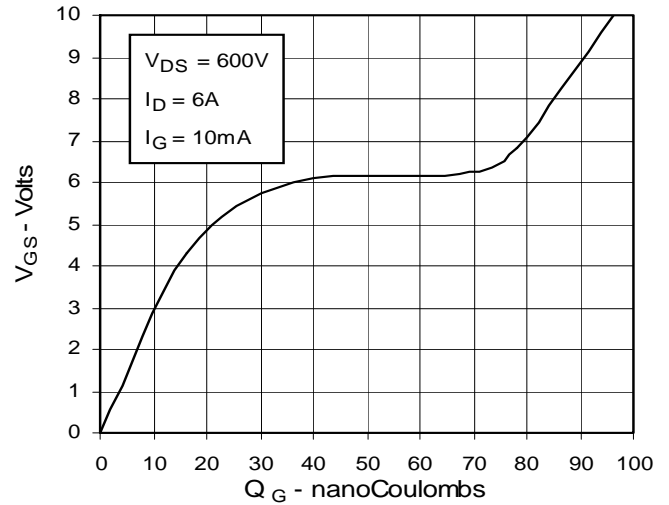


Fig. 11. Capacitance

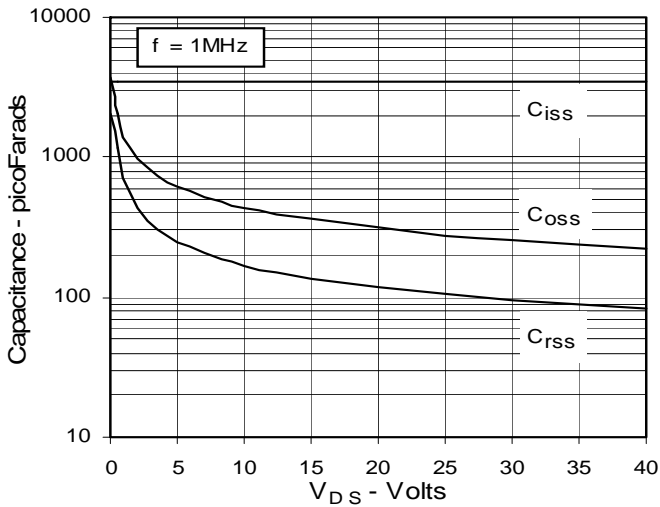


Fig. 12. Maximum Transient Thermal Resistance

