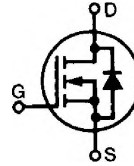


HiPerFET™ Power MOSFET

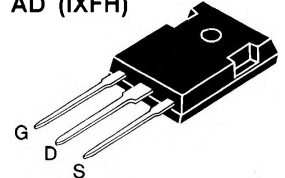
N-Channel Enhancement Mode
High dv/dt, Low t_{rr} , HDMOS™ Family

	V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
IXFH/FM 6N90	900 V	6 A	1.8 Ω	250 ns
IXFH/FM 6N100	1000 V	6 A	2.0 Ω	250 ns

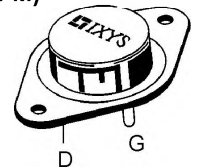


Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	6N90	900	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$	6N100	1000	V
V_{GS}	Continuous		± 20	V
V_{GSM}	Transient		± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$		6	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}		24	A
I_{AR}	$T_C = 25^\circ\text{C}$		6	A
E_{AR}	$T_C = 25^\circ\text{C}$		18	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2\text{ }\Omega$		5	V/ns
P_D	$T_C = 25^\circ\text{C}$		180	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		TO-204 = 18 g, TO-247 = 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 (IXFH)



TO-204 AA (IXFM)



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

Features

- International standard packages
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
 - easy to drive and to protect
- Fast intrinsic Rectifier

Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls
- Low voltage relays

Advantages

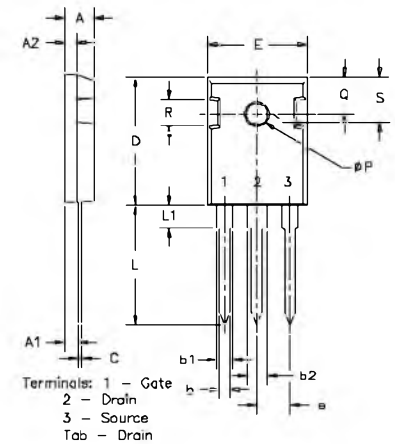
- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 3\text{ mA}$	6N90 6N100	900 1000	V V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 2.5\text{ mA}$	2.0		4.5 V
I_{GSS}	$V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100\text{ nA}$
I_{DSS}	$V_{DS} = 0.8\text{ V}_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$			250 μA 1 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 0.5\text{ I}_{D25}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\delta \leq 2\%$	6N90 6N100		1.8 Ω 2.0 Ω

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}$, $I_D = 0.5 I_{D25}$, pulse test	4	6	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		2600	pF
C_{oss}			180	pF
C_{rss}			45	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{CS} = 0.5 V_{CSS}$, $I_D = 0.5 I_{D25}$ $R_G = 4.7\ \Omega$ (External)		35	100 ns
t_r			40	110 ns
$t_{d(off)}$			100	200 ns
t_f			60	100 ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{CS} = 0.5 V_{CSS}$, $I_D = 0.5 I_{D25}$		88	130 nC
Q_{gs}			21	30 nC
Q_{gd}			38	70 nC
R_{thJC}				0.7 K/W
R_{thCK}			0.25	K/W

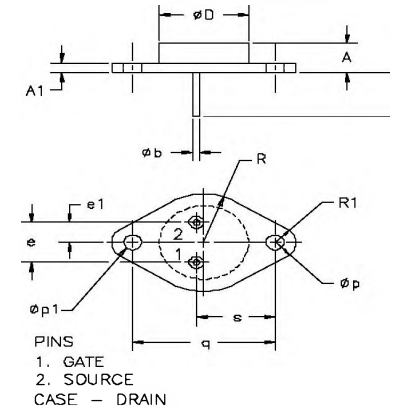
Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	Min.	Typ.	Max.
I_S	$V_{GS} = 0$			6 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			24 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\delta \leq 2\%$			1.5 V
t_{rr}	$I_F = I_S$ $-di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$		250 ns
		$T_J = 125^\circ\text{C}$		400 ns
Q_{RM}		$T_J = 25^\circ\text{C}$	0.5	μC
		$T_J = 125^\circ\text{C}$	1.0	μC
I_{RM}		$T_J = 25^\circ\text{C}$	7.5	A
		$T_J = 125^\circ\text{C}$	9.0	A

TO-247 AD (IXFH) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.7	5.3
A1	.087	.102	2.2	2.54
A2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b1	.065	.084	1.65	2.13
b2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
øP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

TO-204 AA (IXFM) Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.250	.450	6.4	11.4
A1		.135		3.42
øb	.038	.043	.97	1.09
øD		.875		22.22
e	.420	.440	10.67	11.17
e1	.205	.225	5.21	5.71
L	.312		7.93	
øp	.151	.165	3.84	4.19
øp1	.151	.165	3.84	4.19
q	1.187 BSC		30.15 BSC	
R		.525		13.33
R1		.188		4.77
s	.655	.675	16.64	17.14

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	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715
4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025

Fig.1. Output Characteristics

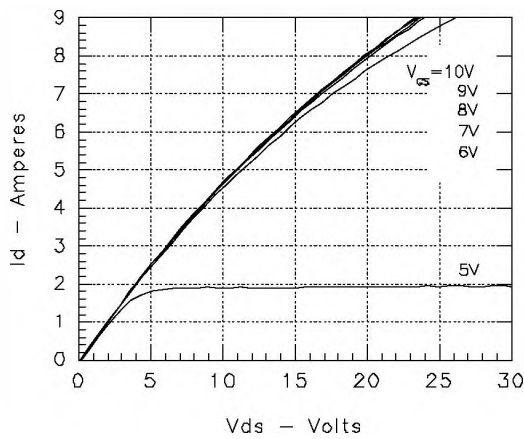


Fig. 2. Input Admittance

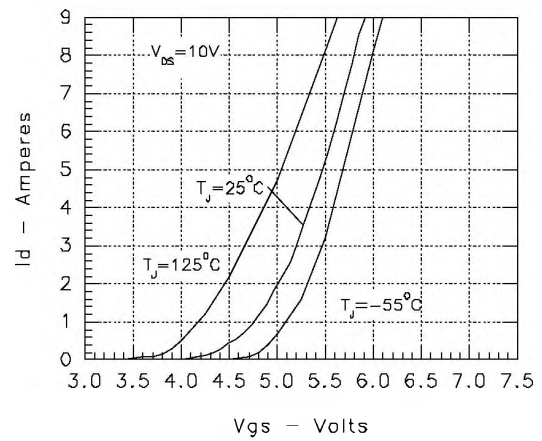


Fig. 3. Rds(on) vs. Drain Current

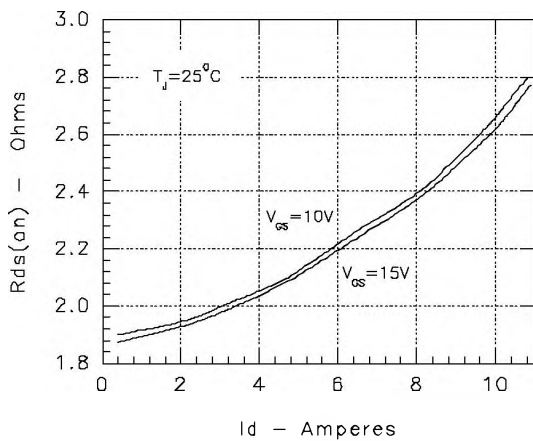


Fig. 4. Temperature Dependence of Drain to Source Resistance

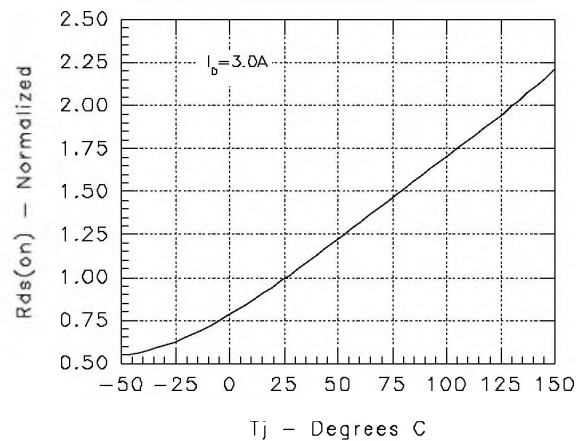


Fig. 5. Drain Current vs. Case Temperature

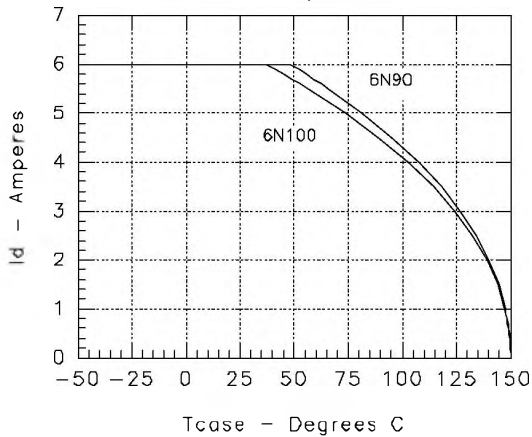


Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage

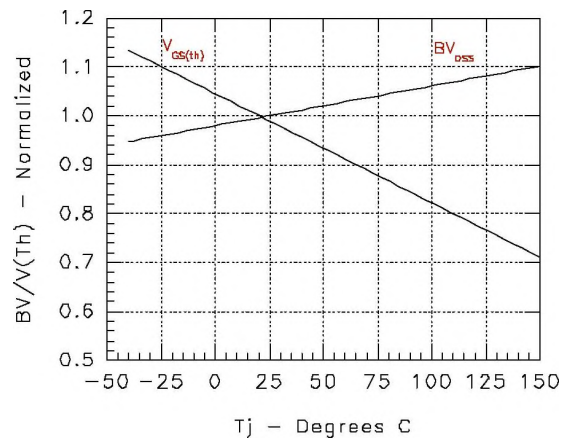


Fig. 7. Gate Charge

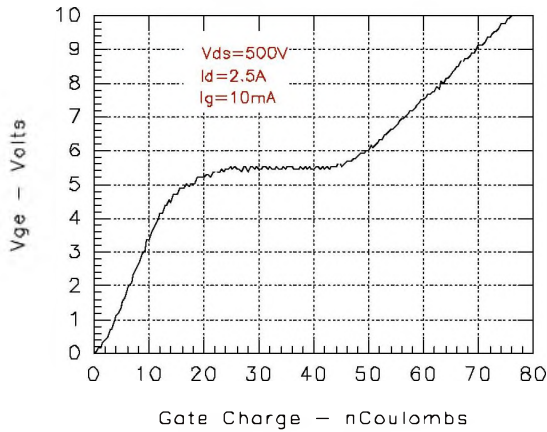


Fig. 8. Forward Bias Safe Operating Area

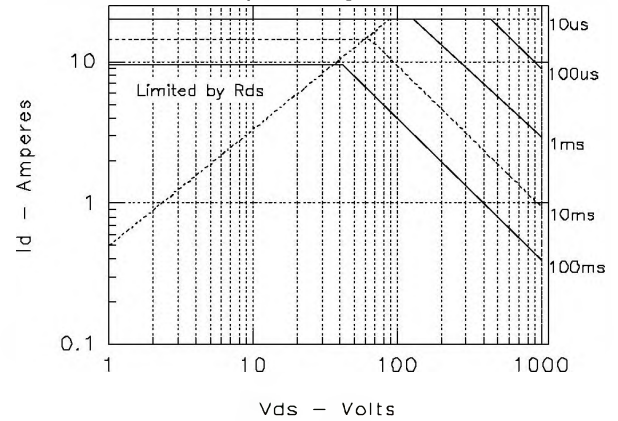


Fig. 9. Capacitance Curves

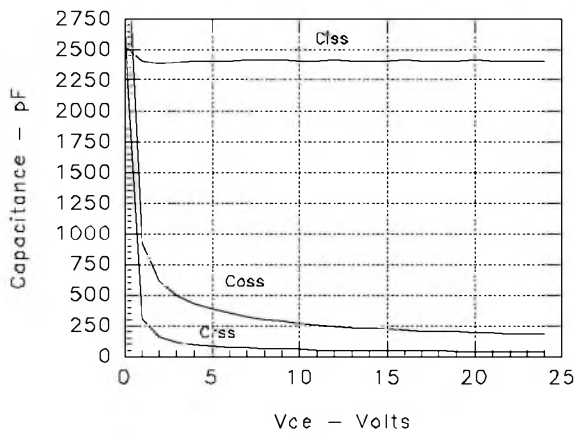


Fig. 10. Source Current vs. Source to Drain Voltage

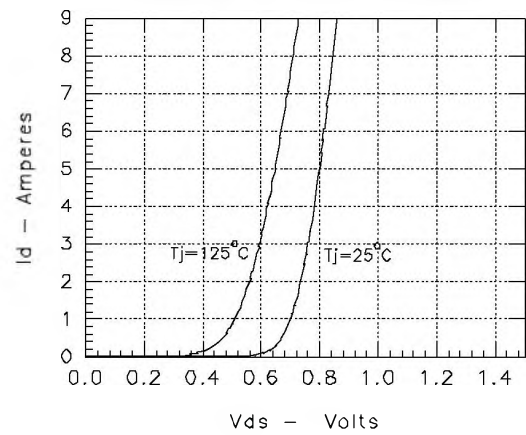


Fig. 11. Transient Thermal Impedance

