

HiPerFET™ Power MOSFETs

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

Obsolete:

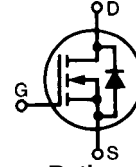
IXFM10N100

IXFM12N100

~~IXFH/IXFM10N100~~

~~IXFH/IXFM12N100~~

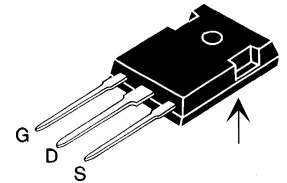
IXFH13N100



V_{DSS}	I_{D25}	$R_{DS(on)}$
1000 V	10 A	1.20 Ω
1000 V	12 A	1.05 Ω
1000 V	12.5 A	0.90 Ω
$t_{rr} \leq 250$ ns		

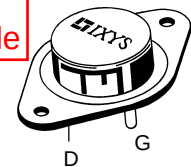
Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^{\circ}\text{C}$ to 150°C	1000	V	
V_{DGR}	$T_J = 25^{\circ}\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$	1000	V	
V_{GS}	Continuous	± 20	V	
V_{GSM}	Transient	± 30	V	
I_{D25}	$T_C = 25^{\circ}\text{C}$	10N100	10	A
		12N100	12	A
		13N100	12.5	A
I_{DM}	$T_C = 25^{\circ}\text{C}$, pulse width limited by T_{JM}	10N100	40	A
		12N100	48	A
		13N100	50	A
I_{AR}	$T_C = 25^{\circ}\text{C}$	10N100	10	A
		12N100	12	A
		13N100	12.5	A
E_{AR}	$T_C = 25^{\circ}\text{C}$	30	mJ	
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^{\circ}\text{C}$, $R_G = 2\ \Omega$	5	V/ns	
P_D	$T_C = 25^{\circ}\text{C}$	300	W	
T_J		-55 ... +150	$^{\circ}\text{C}$	
T_{JM}		150	$^{\circ}\text{C}$	
T_{stg}		-55 ... +150	$^{\circ}\text{C}$	
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^{\circ}\text{C}$	
M_d	Mounting torque	1.13/10	Nm/lb.in	
Weight		TO-204 = 18 g, TO-247 = 6 g		

TO-247 AD (IXFH)



~~TO-204 AA (IXFM)~~

Package
unavailable



G = Gate,
S = Source,

D = Drain,
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

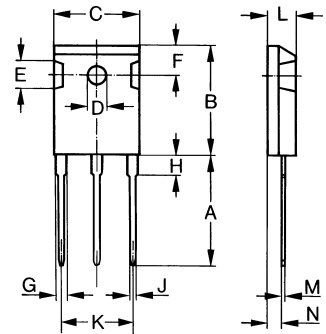
- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values (T _j = 25°C, unless otherwise specified)		
		min.	typ.	max.
V _{DSS}	V _{GS} = 0 V, I _D = 3 mA	1000		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 4 mA	2.0		4.5 V
I _{GSS}	V _{GS} = ±20 V _{DC} , V _{DS} = 0			±100 nA
I _{DSS}	V _{DS} = 0.8 • V _{DSS}	T _j = 25°C		250 μA
	V _{GS} = 0 V	T _j = 125°C		1 mA
R _{DS(on)}	V _{GS} = 10 V, I _D = 0.5 • I _{D25}	10N100		1.20 Ω
		12N100		1.05 Ω
		13N100		0.90 Ω
		Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 \cdot I_{D25}$, pulse test	6	10	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		4000	pF
C_{oss}			310	pF
C_{rss}			70	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 2\ \Omega$ (External),		21	50 ns
t_r			33	50 ns
$t_{d(off)}$			62	100 ns
t_f			32	50 ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		122	155 nC
Q_{gs}			30	45 nC
Q_{gd}			50	80 nC
R_{thJC}			0.25	0.42 K/W
R_{thCK}				K/W

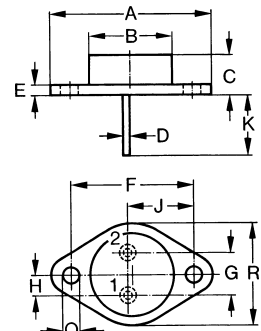
Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$	10N100 12N100 13N100		10 A 12 A 12.5 A
I_{SM}	Repetitive; pulse width limited by T_{JM}	10N100 12N100 13N100		40 A 48 A 50 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			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}		$T_J = 25^\circ\text{C}$	1	μC
		$T_J = 125^\circ\text{C}$	2	μC
I_{RM}		$T_J = 25^\circ\text{C}$	10	A
		$T_J = 125^\circ\text{C}$	15	A

TO-247 AD (IXFH) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

TO-204 AA (IXFM) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	38.61	39.12	1.520	1.540
B	19.43	19.94	-	0.785
C	6.40	9.14	0.252	0.360
D	0.97	1.09	0.038	0.043
E	1.53	2.92	0.060	0.115
F	30.15	BSC	1.187	BSC
G	10.67	11.17	0.420	0.440
H	5.21	5.71	0.205	0.225
J	16.64	17.14	0.655	0.675
K	11.18	12.19	0.440	0.480
L	3.84	4.19	0.151	0.165
M	25.16	25.90	0.991	1.020

Fig. 1 Output Characteristics

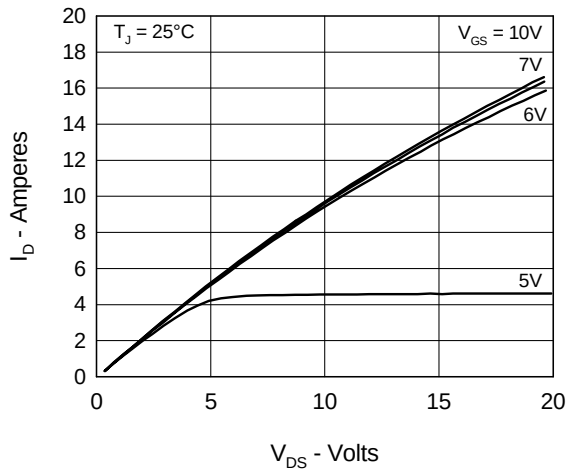


Fig. 2 Input Admittance

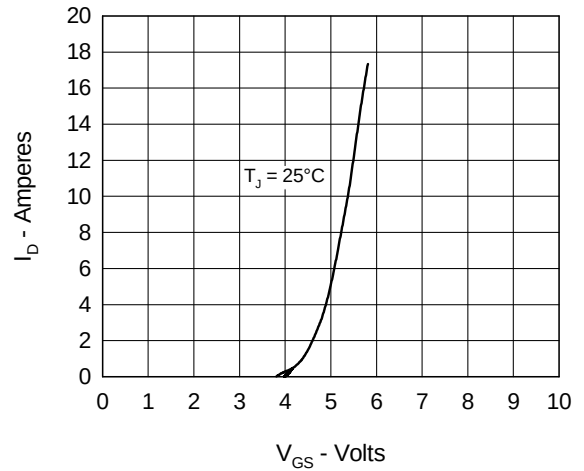


Fig. 3 $R_{DS(on)}$ vs. Drain Current

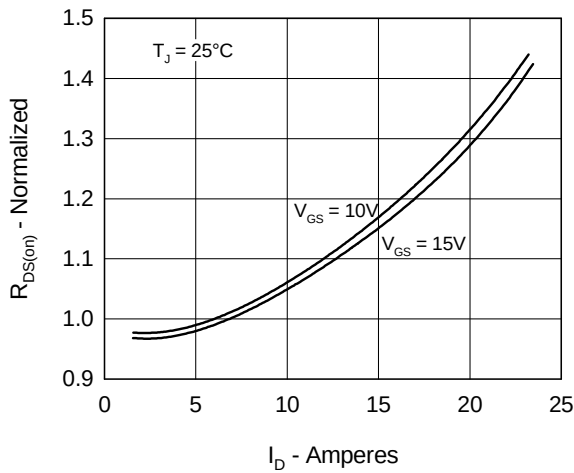


Fig. 4 Temperature Dependence of Drain to Source Resistance

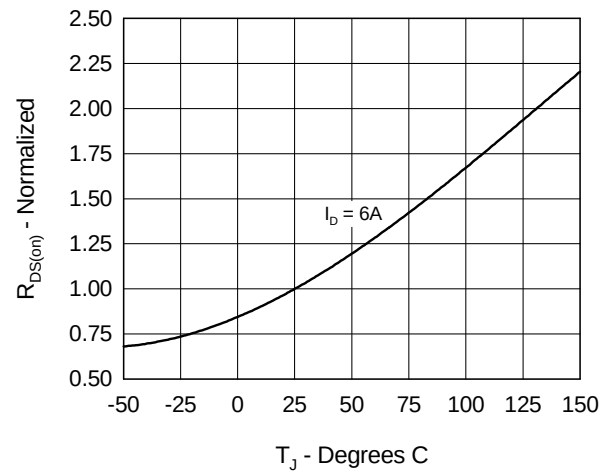


Fig. 5 Drain Current vs. Case Temperature

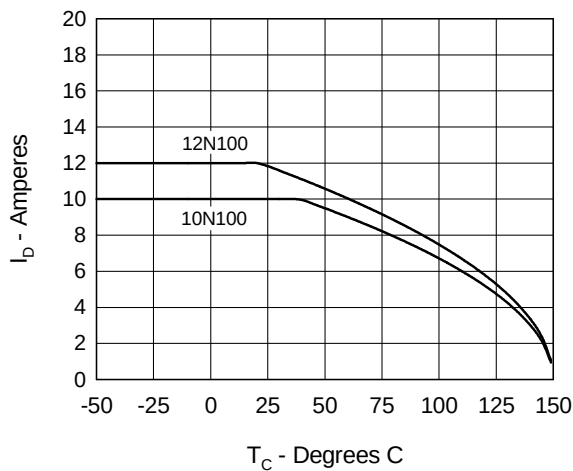


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

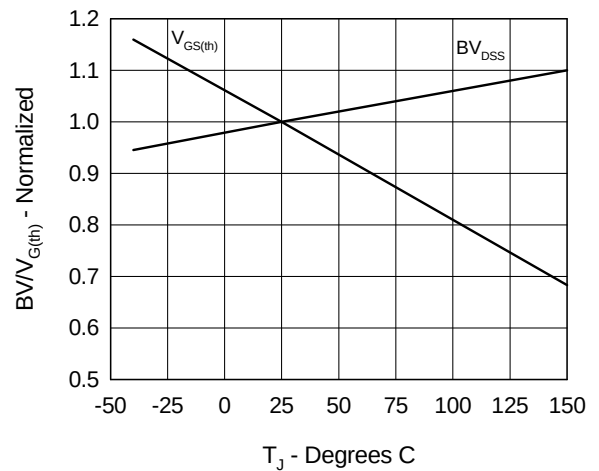


Fig.7 Gate Charge Characteristic Curve

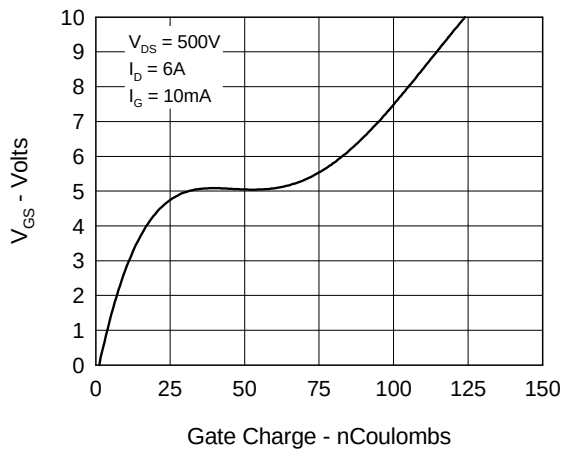


Fig.8 Capacitance Curves

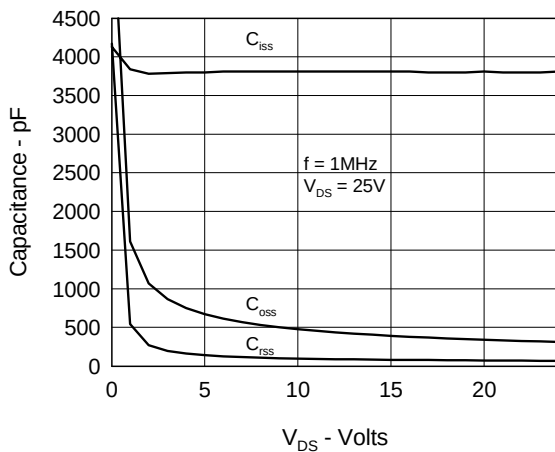


Fig.9 Source Current vs. Source to Drain Voltage

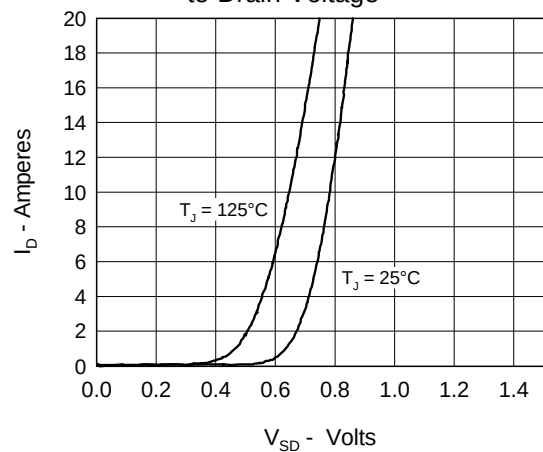
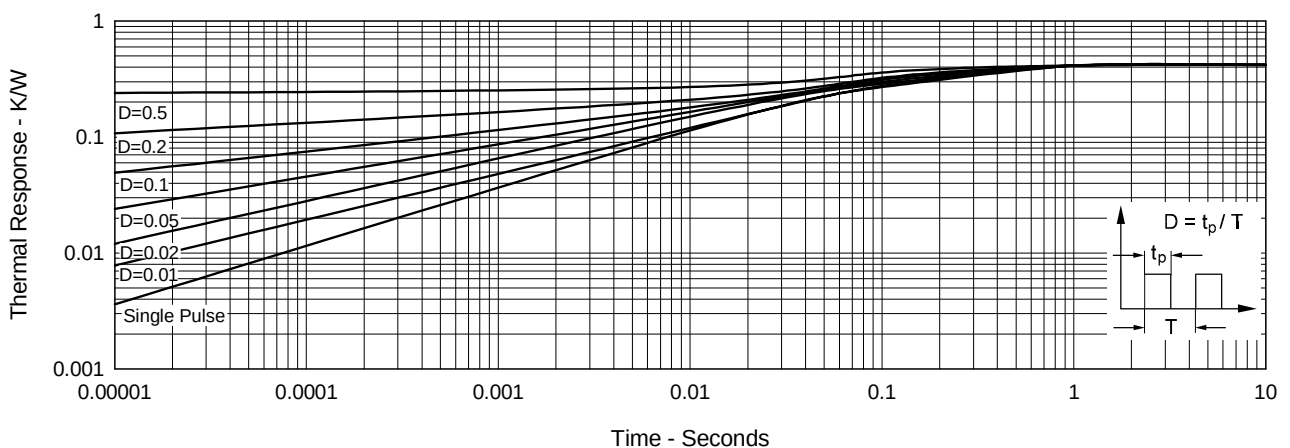


Fig.10 Transient Thermal Impedance





Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.