

HiPerFET™ Power MOSFETs

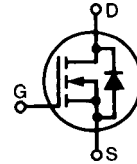
IXFH/IXFT/IXFX14N100
IXFH/IXFT/IXFX15N100

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

V_{DSS}	I_{D25}	$R_{DS(on)}$
1000 V	14 A	0.75 Ω
1000 V	15 A	0.70 Ω

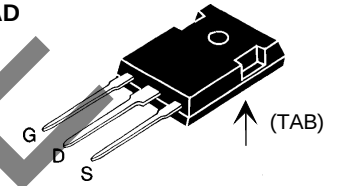
$t_{rr} \leq 200$ ns

Preliminary data sheet

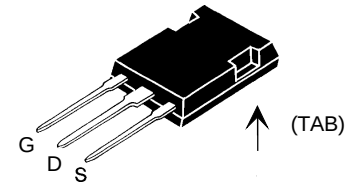


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	1000	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω	1000	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	14N100 14 15N100 15	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	14N100 56 15N100 60	A
I_{AR}	$T_C = 25^\circ\text{C}$	14N100 14 15N100 15	A
E_{AR}	$T_C = 25^\circ\text{C}$	45	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μs , $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω	5	V/ns
P_D	$T_C = 25^\circ\text{C}$	360	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		6	g

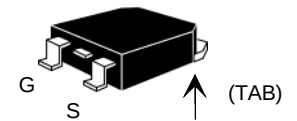
TO-247 AD
(IXFH)



PLUS 247™
(IXFX)



TO-268 (D3)
(IXFT)



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
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Temperature and lighting controls

Advantages

- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole) or mounting clip or spring (PLUS 247™)
- High power surface mountable package
- High power density

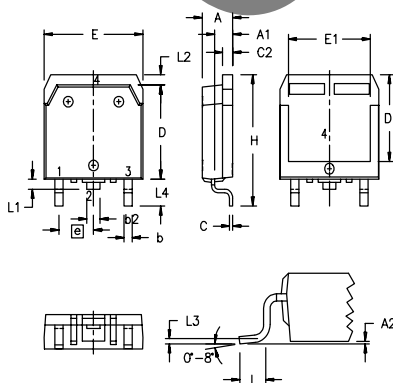
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 1$ mA	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4$ mA	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20$ V $_{DC}$, $V_{DS} = 0$			± 100 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0$ V, $T_J = 125^\circ\text{C}$			250 μA 1 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300$ μs , duty cycle $d \leq 2$ %	14N100 0.75 15N100 0.70		Ω Ω

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 \cdot I_{D25}$, pulse test	6	10	S
C_{iss} C_{oss} C_{rss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		4500 430 150	pF pF pF
$t_{d(on)}$ t_r $t_{d(off)}$ t_f			27 30 120 30	ns ns ns ns
$Q_{g(on)}$ Q_{gs} Q_{gd}			220 30 85	nC nC nC
R_{thJC} R_{thCK}	(TO-247 Case Style)		0.25	0.35 K/W K/W

Source-Drain Diode

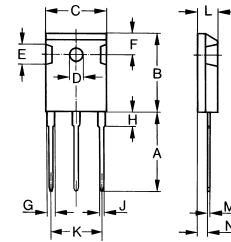
Source-Drain Diode		Characteristic Values (T _J = 25°C, unless otherwise specified)				
Symbol	Test Conditions			min.	typ.	max.
I _S	V _{GS} = 0 V	14N100				14 A
		15N100				15 A
I _{SM}	Repetitive; pulse width limited by T _{JM}	14N100				56 A
		15N100				60 A
V _{SD}	I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %					1.5 V
t _{rr}	I_F = I_S -di/dt = 100 A/μs, V_R = 100 V	T _J = 25°C				200 ns
		T _J = 125°C				350 ns
Q _{RM}		T _J = 25°C		1		μC
		T _J = 125°C		2		μC
I _{RM}		T _J = 25°C		10		A
		T _J = 125°C		15		A

TO-268AA (D³ PAK)



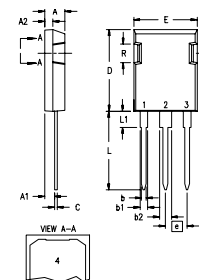
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.9	5.1	.193	.201
A ₁	2.7	2.9	.106	.114
A ₂	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b ₁	1.9	2.1	.75	.83
b ₂	.4	.65	.016	.026
C	13.80	14.00	.543	.551
D	15.85	16.05	.624	.632
E	13.3	13.6	.524	.535
E ₁	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L ₁	1.20	1.40	.047	.055
L ₂	1.00	1.15	.039	.045
L ₃	0.25 BSC		.010 BSC	
L ₄	3.80	4.10	.150	.161

TO-247 AD (IXFH) Outline



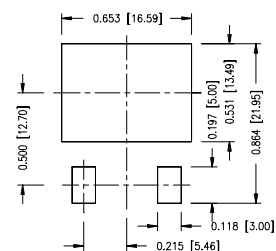
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209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

PLUS247™ (IXFX) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L ₁	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

Min. Recommended Footprint



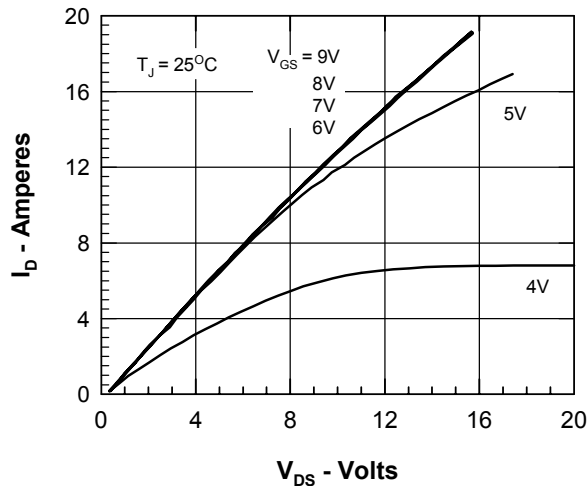


Fig.1 Output Characteristics

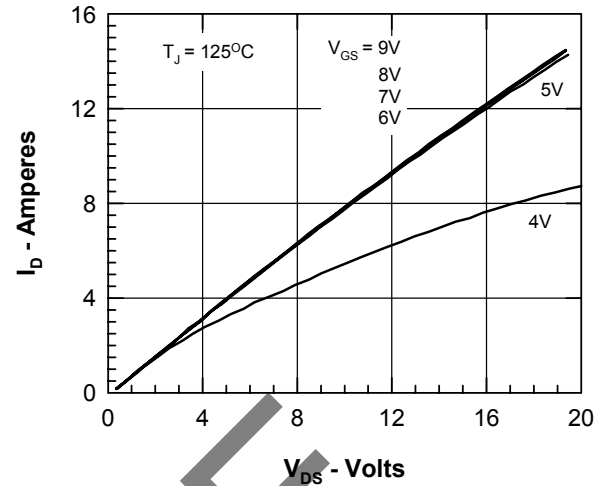


Fig.2 Output characteristics at elevated temperature

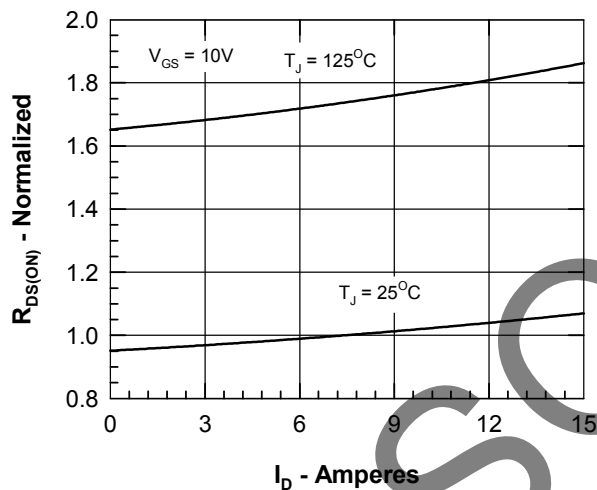
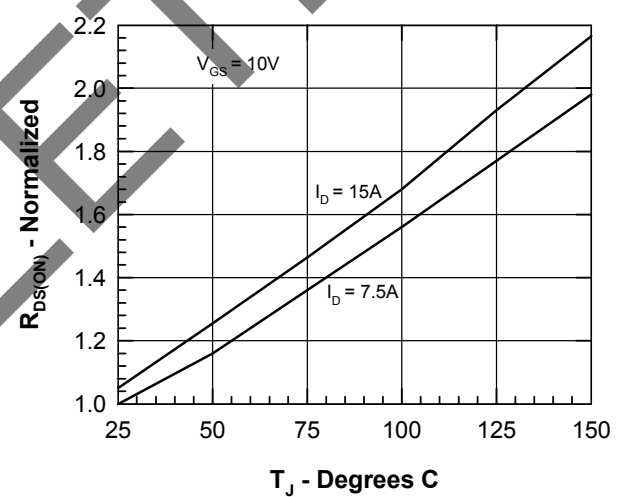

Fig.3 $R_{DS(on)}$ vs. Drain Current


Fig.4 Temperature Dependence of Drain to Source Resistance

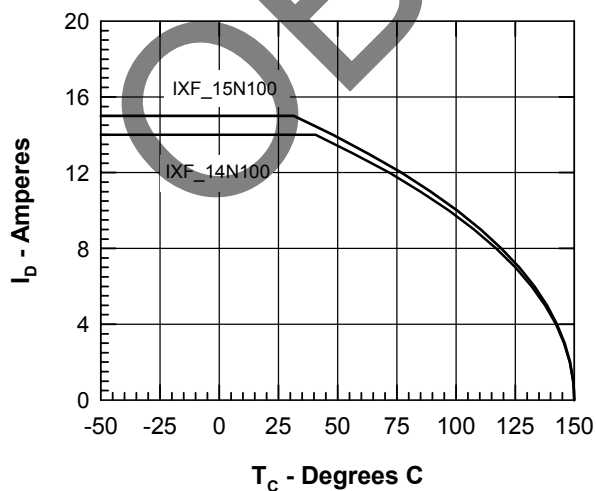


Fig.5 Drain Current vs. Case Temperature

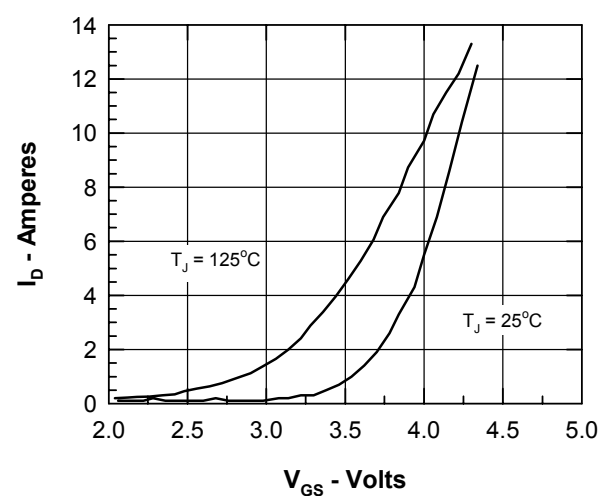


Fig.6 Input admittance

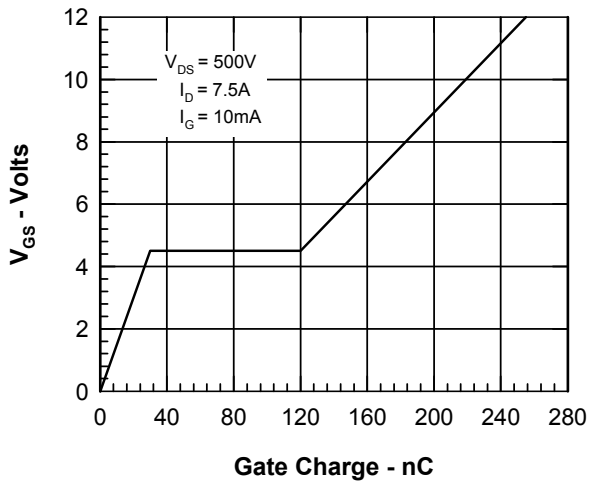


Fig.7 Gate Charge Characteristic Curve

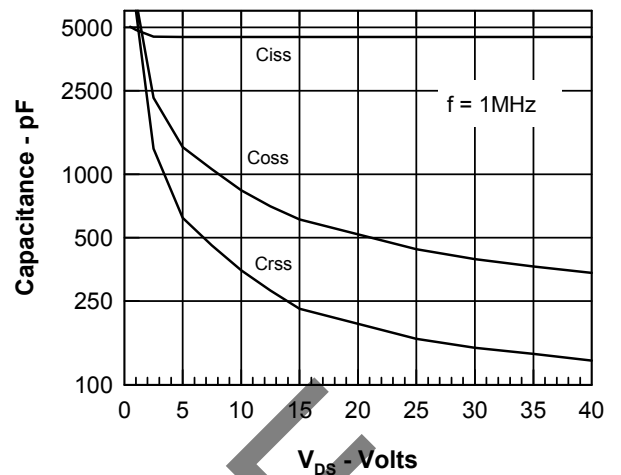


Fig.8 Capacitance Curves

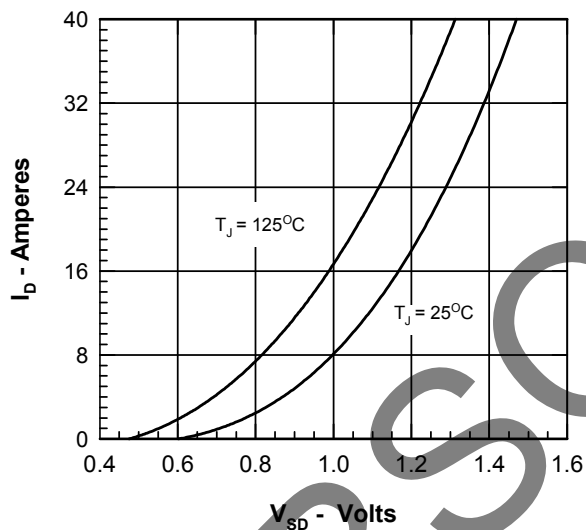


Fig.9 Source current vs Source drain voltage.

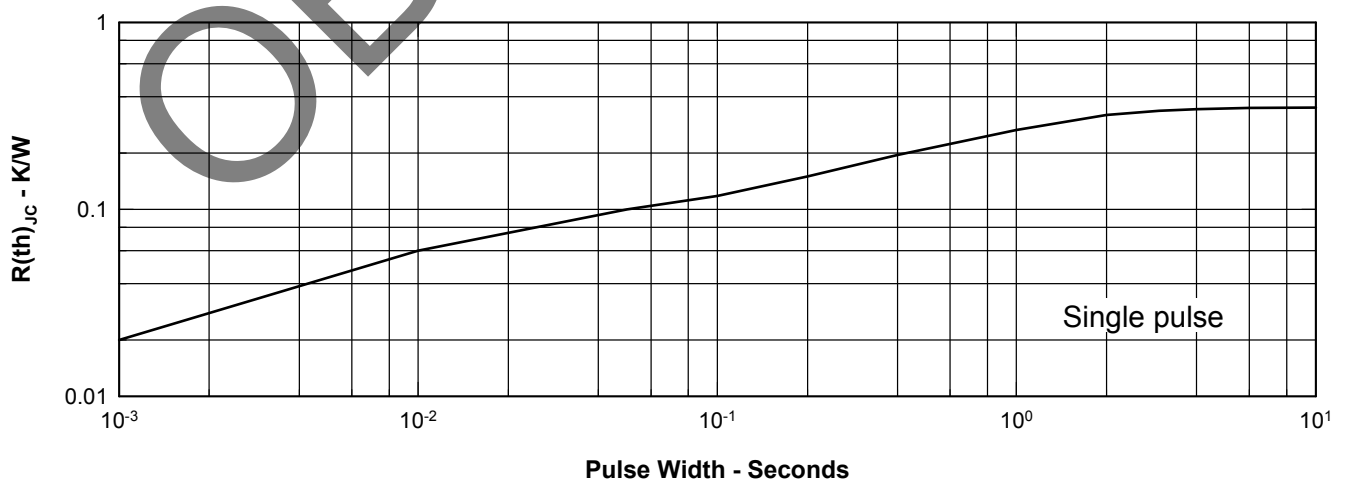


Fig.10 Transient Thermal Impedance



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