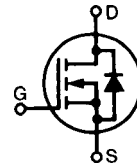


HiPerFET™ Power MOSFETs

IXFH/IXFM35N30
IXFH40N30
IXFM40N30

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

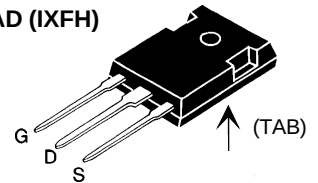


V_{DSS}	I_{D25}	$R_{DS(on)}$
300 V	35 A	100 mΩ
300 V	40 A	85 mΩ
300 V	40 A	88 mΩ

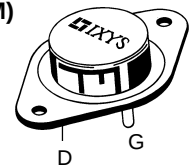
$t_{rr} \leq 200 \text{ ns}$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	300	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	300	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	35N30	35 A
		40N30	40 A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	35N30	140 A
		40N30	160 A
I_{AR}	$T_C = 25^\circ\text{C}$	35N30	35 A
		40N30	40 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 AE (IXFM)



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

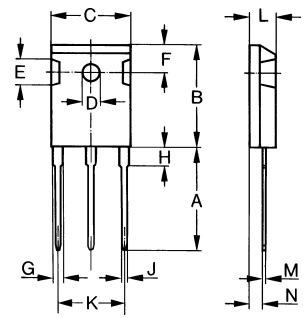
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	300		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2		4 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		200 μA
				1 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$	35N30		0.100 Ω
		FH40N30		0.085 Ω
		FM40N30		0.088 Ω
		Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$		

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}$; $I_D = 0.5 I_{D25}$, pulse test	22	25	S
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		4800	pF
C_{oss}			745	pF
C_{rss}			280	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 I_{D25}$ $R_G = 2\ \Omega$ (External)		20	30 ns
t_r			60	90 ns
$t_{d(off)}$			75	100 ns
t_f			45	90 ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 I_{D25}$		177	200 nC
Q_{gs}			28	50 nC
Q_{gd}			78	105 nC
R_{thJC}			0.25	0.42 K/W
R_{thCK}				K/W

Source-Drain Diode

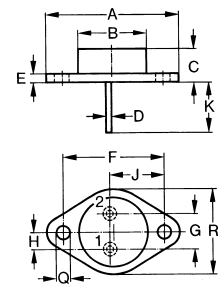
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$	35N30 40N30		35 A 40 A
I_{SM}	Repetitive; pulse width limited by T_{JM}	35N30 40N30		140 A 160 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = I_S$, $-di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		200 ns 350 ns

TO-247 AD (IXFH) Outline



Dim.	Millimeter Min. Max.	Inches 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 AE (IXFM) Outline



Dim.	Millimeter Min. Max.	Inches Min. Max.
A	38.61 39.12	1.520 1.540
B	- 22.22	- 0.875
C	6.40 11.40	0.252 0.449
D	1.45 1.60	0.057 0.063
E	1.52 3.43	0.060 0.135
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
Q	3.84 4.19	0.151 0.165
R	25.16 26.66	0.991 1.050

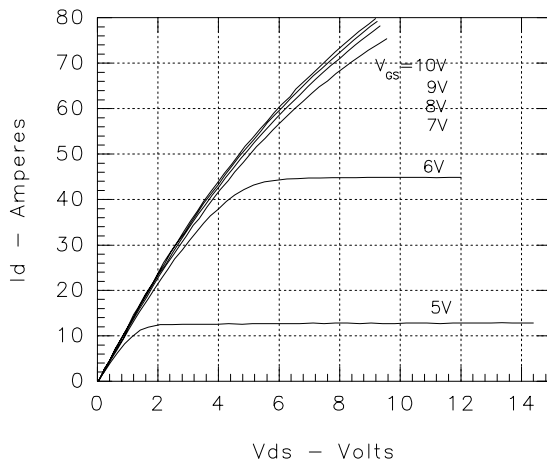
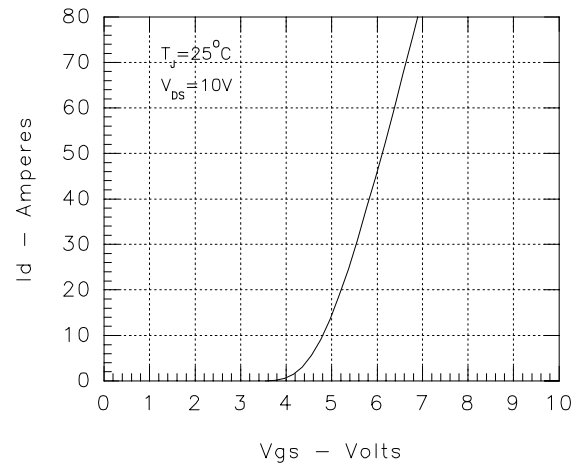
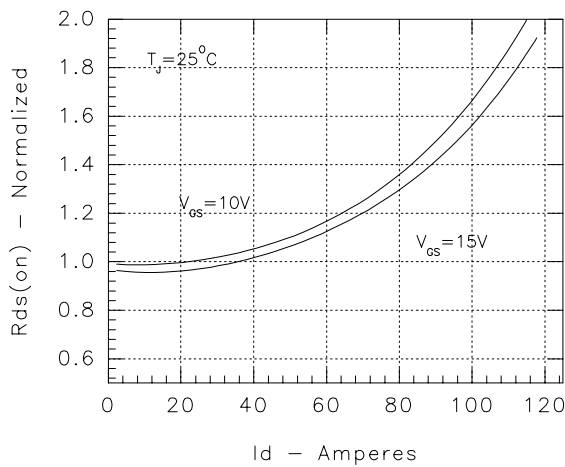
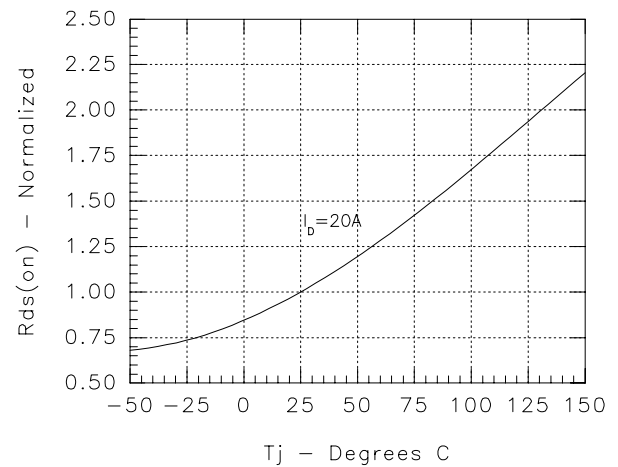
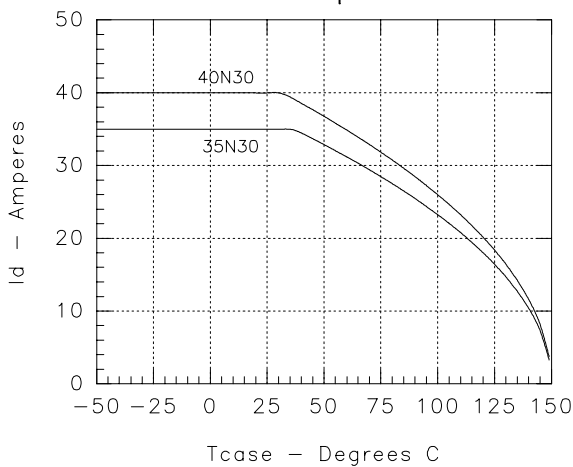
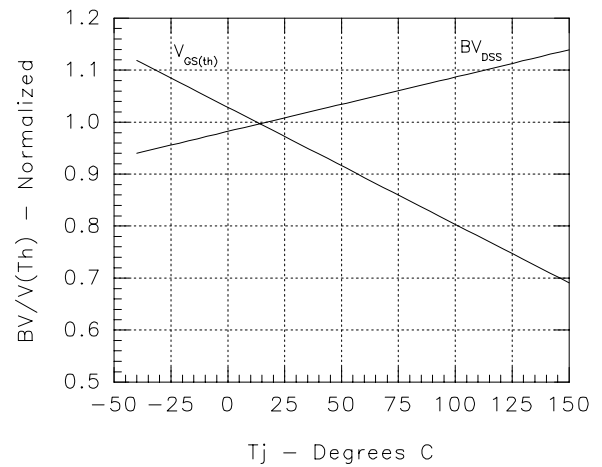
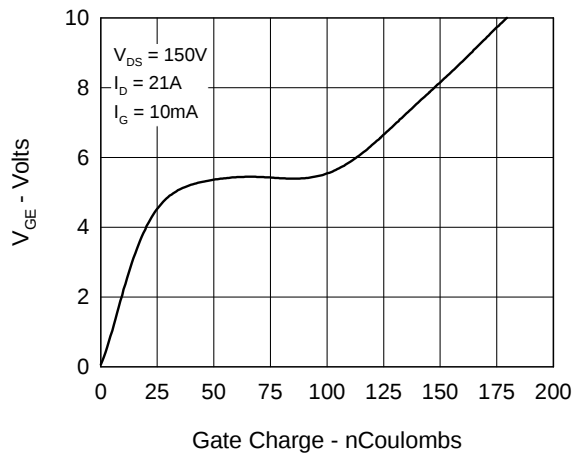
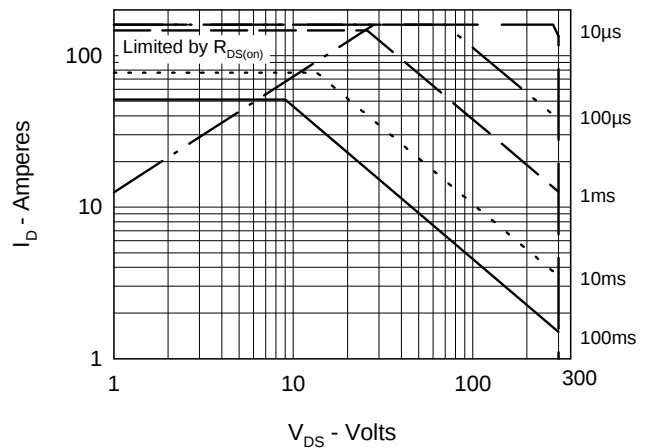
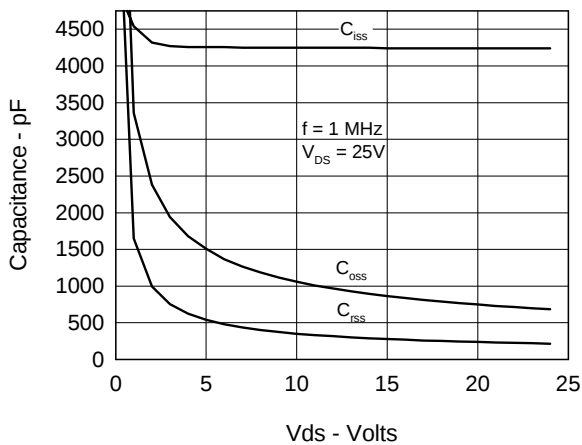
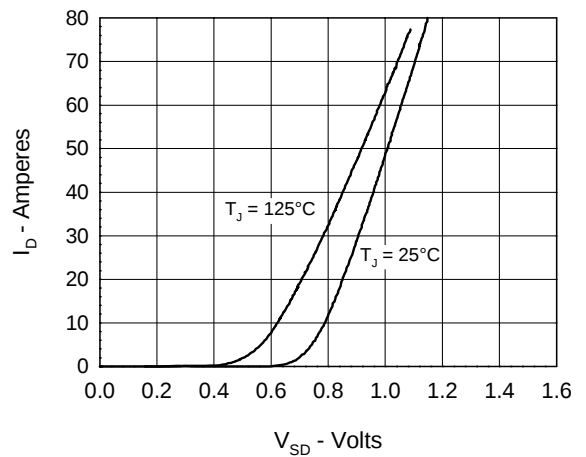
Fig.1. Output Characteristics

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 Characteristic Curve

Fig.8 Forward Bias Safe Operating Area

Fig.9 Capacitance Curves

Fig.10 Source Current vs. Source

Fig.11 Transient Thermal Impedance
