

HiPerFET™ Power MOSFETs

IXFH/IXFT 30N50
IXFH/IXFT 32N50

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

Obsolete:
IXFH30N50
IXFH32N50
IXFT32N50

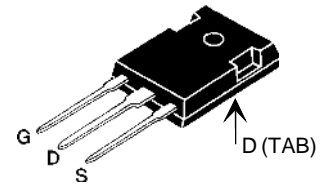


V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	30 A	0.16 Ω
500 V	32 A	0.15 Ω

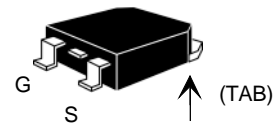
$t_{rr} \leq 250$ ns

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1\text{ M}\Omega$	500	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	30N50 32N50	30 32 A
I_{DM}	$T_C = 25^\circ\text{C}$ pulse width limited by T_{JM}	30N50 32N50	120 128 A
I_{AR}	$T_C = 25^\circ\text{C}$	30N50 32N50	30 32 A
E_{AS}	$T_C = 25^\circ\text{C}$	1.5	J
E_{AR}	$I_D = 25^\circ\text{C}$	45	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	$T_C = 25^\circ\text{C}$	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)



TO-268 (D3) Case Style



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 Diode

Applications

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

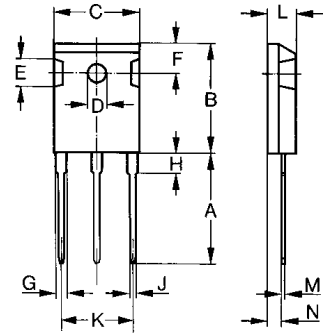
Advantages

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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$ V_{DSS} temperature coefficient	500	0.102	V %/K
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4\text{ mA}$ $V_{GS(th)}$ temperature coefficient	2	-0.206	V %/K
I_{GSS}	$V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$	± 100		nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$	200		μA mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 15\text{ A}$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$	32N50 30N50		0.15 0.16 Ω

Symbol	Test Conditions	Characteristic Values			
		$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$			
		min.	typ.	max.	
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ pulse test	18	28		S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	5200		5700	pF
C_{oss}		640		750	pF
C_{rss}		240		310	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 2\ \Omega$ (External)		35	45	ns
t_r			42	50	ns
$t_{d(off)}$			110	140	ns
t_f			26	35	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		227	300	nC
Q_{gs}			29	40	nC
Q_{gd}			110	145	nC
R_{thJC}	(TO-247 Case Style)			0.35	K/W
R_{thCK}			0.25		K/W

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

Symbol	Test Conditions	Characteristic Values			
		$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$			
		min.	typ.	max.	
I_S	$V_{GS} = 0\text{ V}$				
		30N50		30	A
		32N50		32	A
I_{SM}	Repetitive; pulse width limited by T_{JM}	30N50		120	A
		32N50		128	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}		$T_J = 25^\circ\text{C}$	0.85		μC
		$T_J = 25^\circ\text{C}$		8	A

TO-268AA (D ³ 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 ₂	1.9	2.1	.75	.83		
	C	.4	.65	.016	.026		
	D	13.80	14.00	.543	.551		
	E	15.85	16.05	.624	.632		
	E ₁	13.3	13.6	.524	.535		
	e	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			

Min. Recommended Footprint

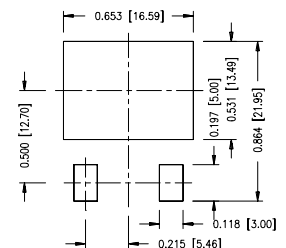


Figure 1. Output Characteristics at 25°C

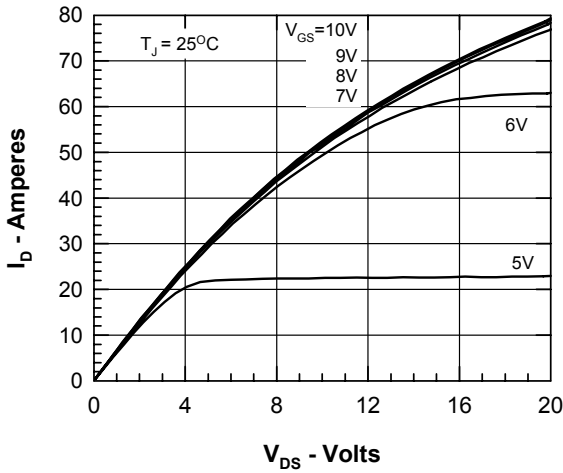


Figure 2. Output Characteristics at 125°C

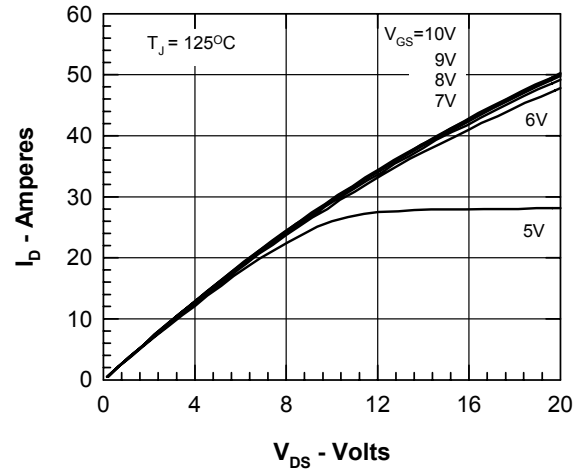


Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

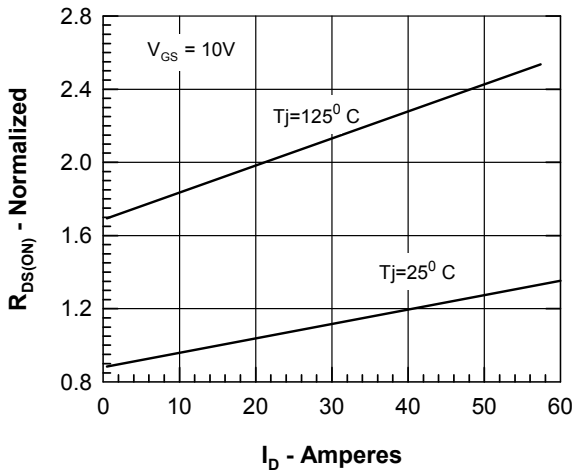


Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

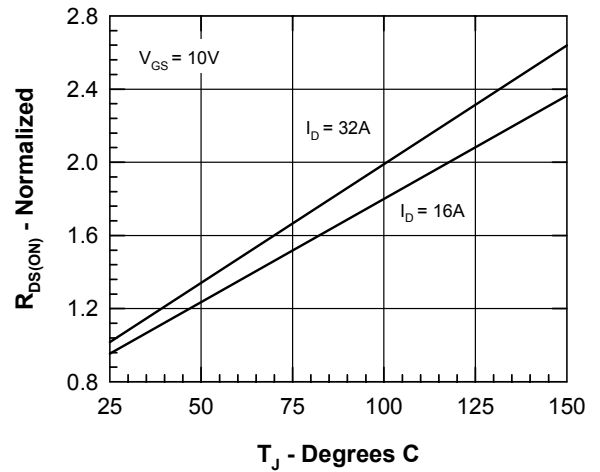


Figure 5. Drain Current vs. Case Temperature

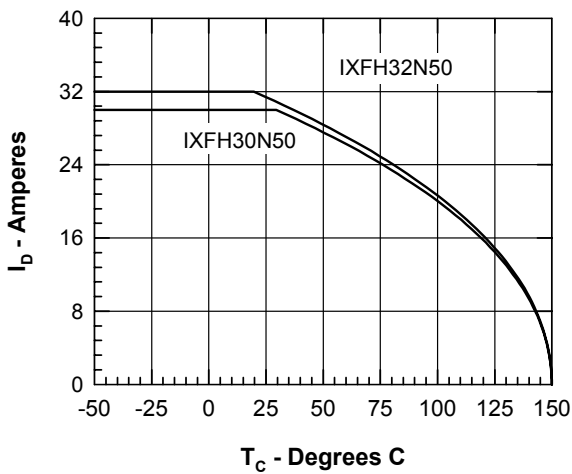


Figure 6. Admittance Curves

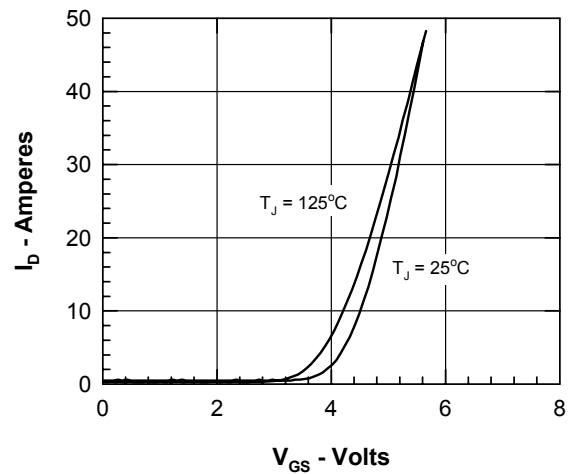


Figure 7. Gate Charge

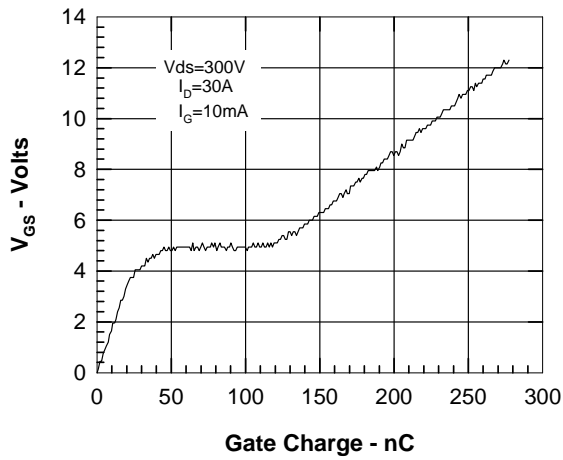


Figure 8. Capacitance Curves

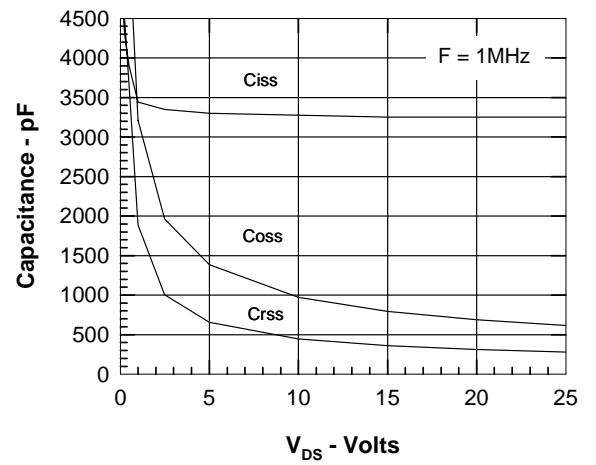


Figure 9. Forward Voltage Drop of the Intrinsic Diode

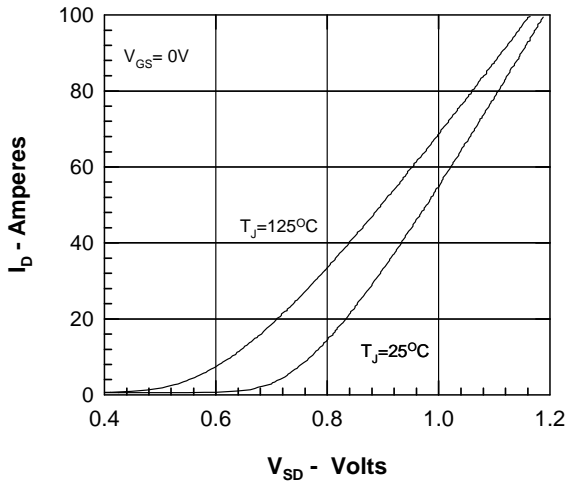


Figure 10. Transient Thermal Resistance

