IXYS

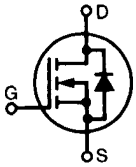
HiPerFET™ Power MOSFETs

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

	V_{DSS}	I_{D25}	$R_{DS(on)}$
IXFH14N80	**800 V**	**14 A**	**0.70 Ω**
IXFH15N80	**800 V**	**15 A**	**0.60 Ω**

t_{rr} ≤ 250 ns

Preliminary data



Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ		800	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	14N80	14	A
		15N80	15	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	14N80	56	A
		15N80	60	A
I_{AR}	T_C = 25°C	14N80	14	A
		15N80	15	A
E_{AR}	T_C = 25°C		30	mJ
dv/dt	I_S ≤ I_{DM}, di/dt ≤ 100 A/µs, V_{DD} ≤ V_{DSS}, T_J ≤ 150°C, R_G = 2 Ω		5	V/ns
P_D	T_C = 25°C		300	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s		300	°C
M_d	Mounting torque		1.13/10	Nm/lb.in.
Weight			6	g

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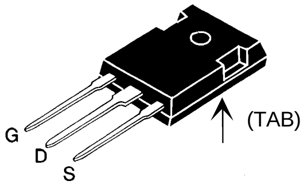


G = Gate
D = Drain
S = Source
TAB = Drain

Symbol (T_J = 25°C, unless otherwise specified)	Test Conditions		Characteristic Values Min.	Typ.	Max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3 mA		800			V
	V_{DSS} temperature coefficient			0.096		%/K
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 4 mA		2.0		4.5	V
	$V_{GS(th)}$ temperature coefficient			-0.214		%/K
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}	14N80			0.70	Ω
		15N80			0.60	Ω
	Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %					

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

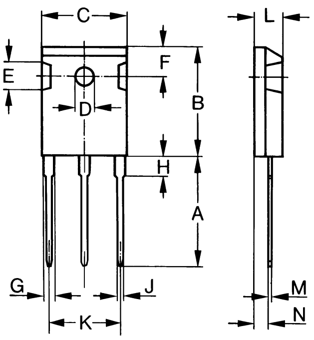
- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 I_{D25}, pulse test	8	14		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	3965		4870	pF
C_{oss}		315		395	pF
C_{rss}		73		120	pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25} R_G = 2 Ω (External)		20	50	ns
t_r			33	50	ns
$t_{d(off)}$			63	100	ns
t_f			32	50	ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		128	155	nC
Q_{gs}			30	45	nC
Q_{gd}			55	80	nC
R_{thJC}				0.42	K/W
R_{thCK}			0.25		K/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V	14N80		14	A
		15N80		15	A
I_{SM}	Repetitive;	14N80		56	A
		15N80		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		250	ns
		T_J = 125°C		400	ns
Q_{RM}			1		µC
I_{RM}			8.5		A

TO-247 AD 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

Figure 1. Output Characteristics at 25^{O}C

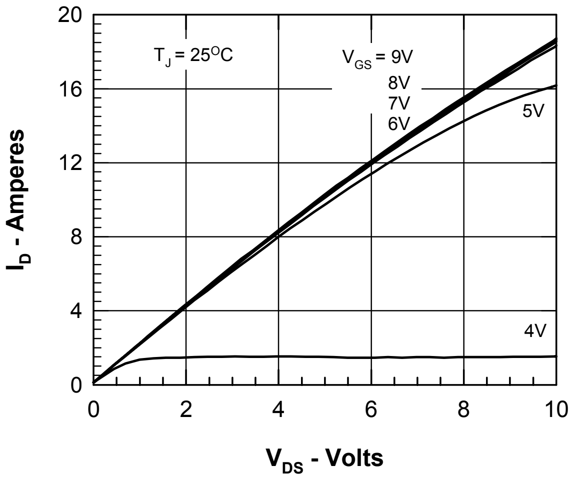


Figure 2. Output Characteristics at 125^{O}C

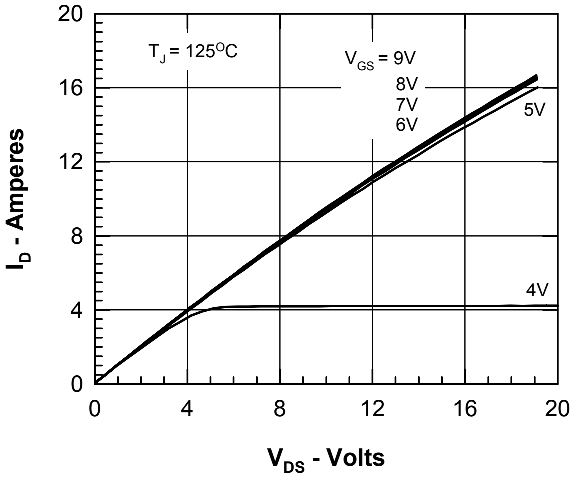


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

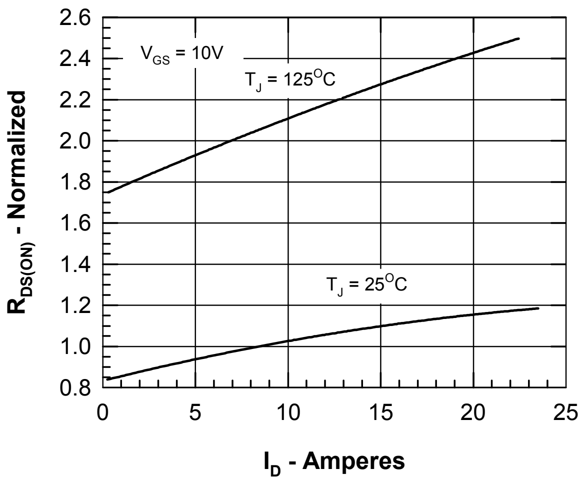


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

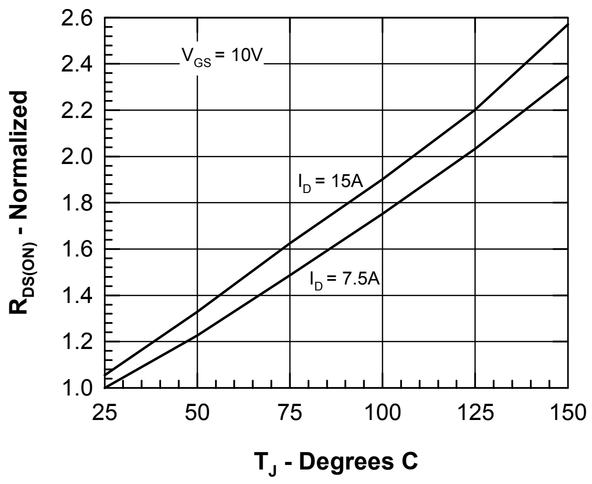


Figure 5. Drain Current vs. Case Temperature

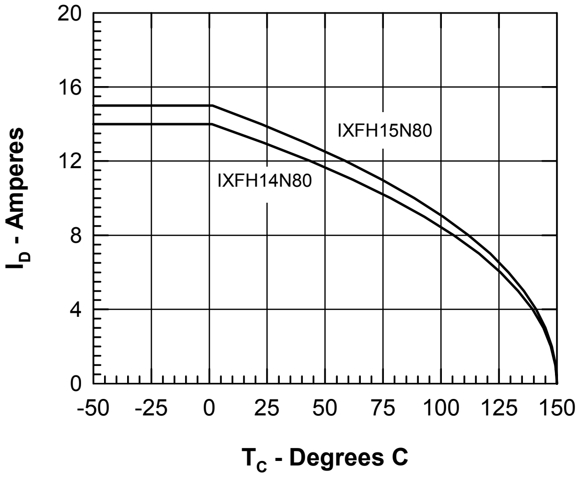


Figure 6. Admittance Curves

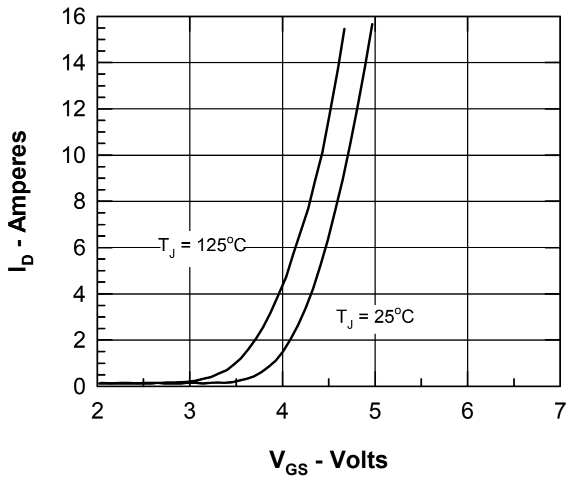


Figure 7. Gate Charge

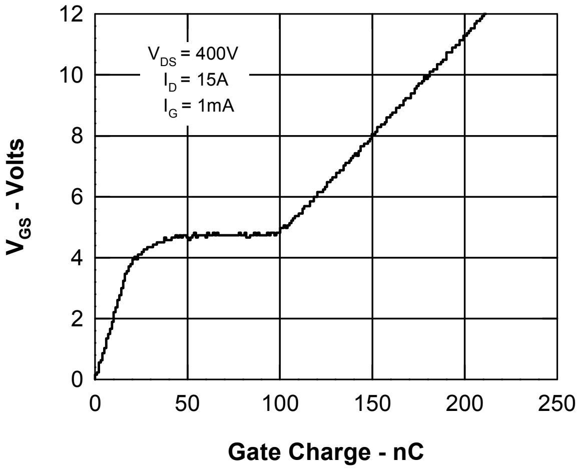


Figure 8. Capacitance Curves

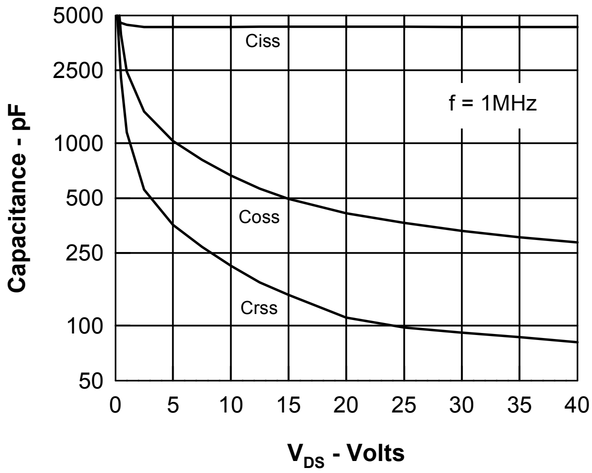


Figure 9. Source Current vs. Source to Drain Voltage

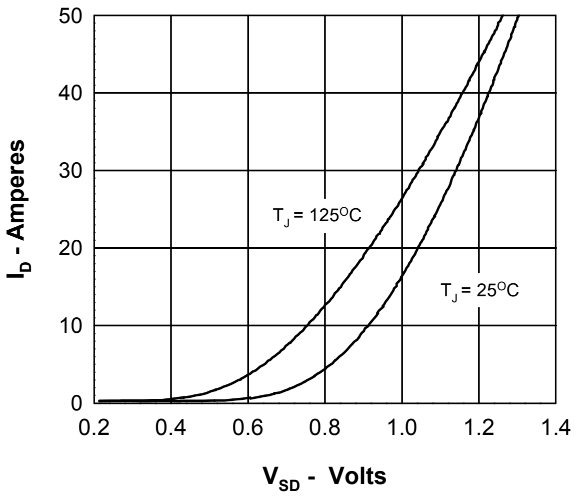


Figure10. Forward Bias Safe Operating Area

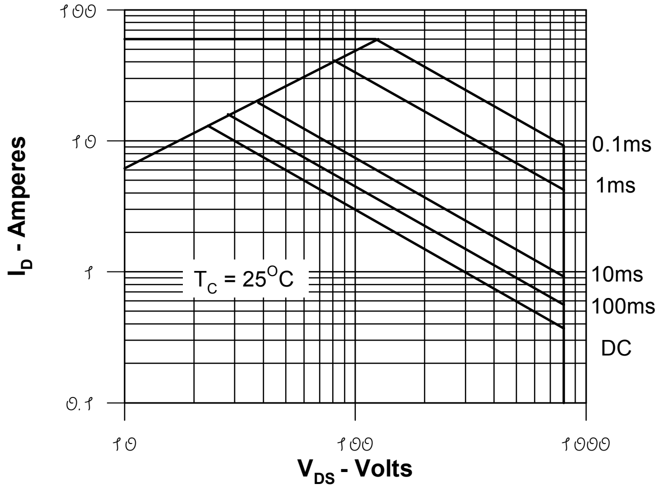


Figure 11. Transient Thermal Resistance