

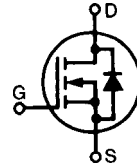
HiPerFET™ Power MOSFETs

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

IXFH14N80
IXFH15N80

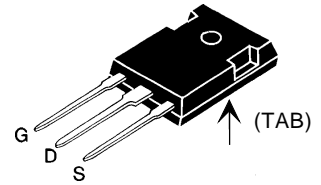
V_{DSS}	I_{D25}	$R_{DS(on)}$
800 V	14 A	0.70 Ω
800 V	15 A	0.60 Ω

$t_{rr} \leq 250$ ns



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	800	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω	800	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	14N80	14 A
		15N80	15 A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	14N80	56 A
		15N80	60 A
I_{AR}	$T_C = 25^\circ\text{C}$	14N80	14 A
		15N80	15 A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μs , $V_{DD} \leq V_{DSS}$	5	V/ns
	$T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω		
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		6	g

TO-247 AD



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 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

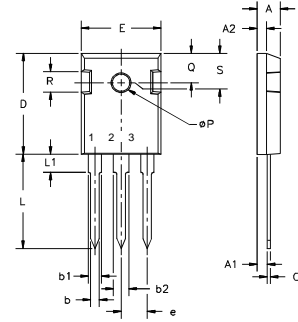
- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	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	2.5		4.5 V
	$V_{GS(th)}$ temperature coefficient		-0.214	%/K
I_{GSS}	$V_{GS} = \pm 20$ V _{DC} , $V_{DS} = 0$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $T_J = 25^\circ\text{C}$			25 μA
	$V_{GS} = 0$ V, $T_J = 125^\circ\text{C}$			1 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 I_{D25}$	14N80		0.70 Ω
	Pulse test, $t \leq 300$ μs , duty cycle $d \leq 2$ %	15N80		0.60 Ω

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
($T_J = 25^\circ\text{C}$, unless otherwise specified)				
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$, pulse test	8	14	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	3965	4870	pF
C_{oss}		315	395	pF
C_{rss}		73	120	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)	20	50	ns
t_r		33	50	ns
$t_{d(off)}$		63	100	ns
t_f		32	50	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$	150	200	nC
Q_{gs}		23	45	nC
Q_{gd}		64	68	nC
R_{thJC}			0.42	K/W
R_{thCK}		0.25		K/W

Symbol	Test Conditions	Characteristic Values			
		min.	typ.	max.	
($T_J = 25^\circ\text{C}$, unless otherwise specified)					
I_S	$V_{GS} = 0\text{ V}$	14N80 15N80		14 15	A A
I_{SM}	Repetitive;	14N80 15N80		56 60	A 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}	$I_F = I_S$ $-di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		250	ns
Q_{RM}			1	400	ns
I_{RM}			8.5		μC
					A

TO-247 AD Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	242	BSC

Figure 1. Output Characteristics at 25°C

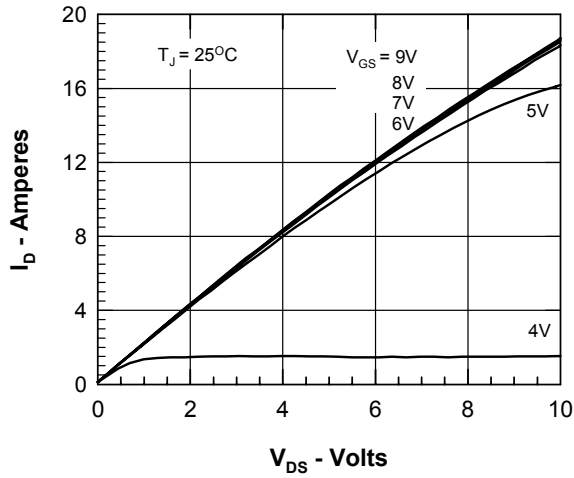


Figure 2. Output Characteristics at 125°C

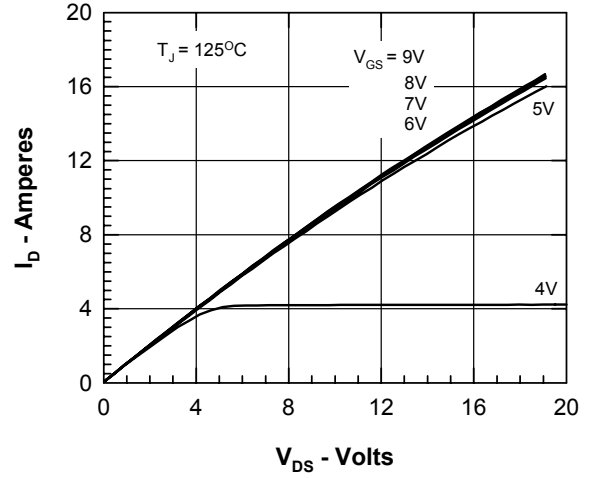


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

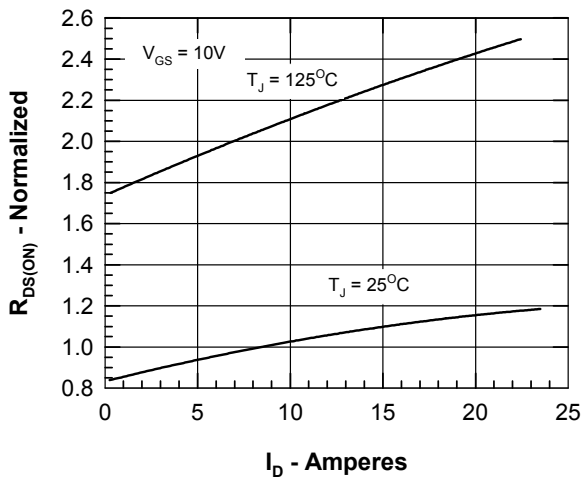


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

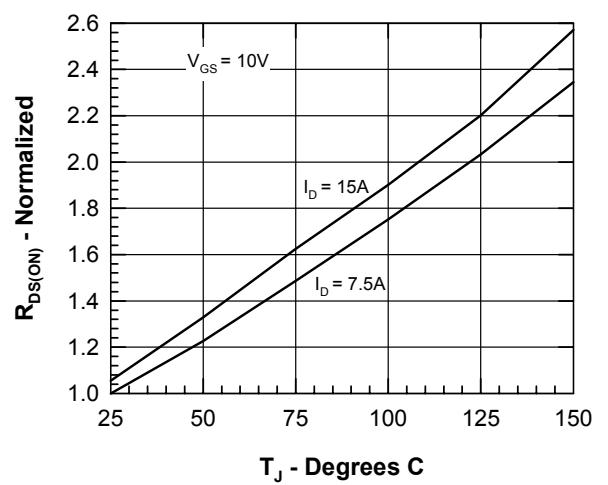


Figure 5. Drain Current vs. Case Temperature

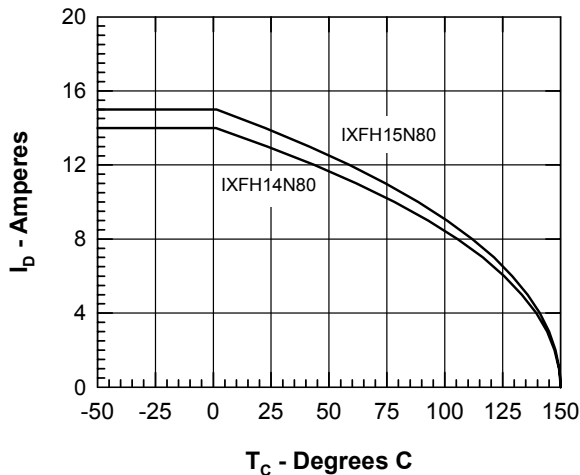


Figure 6. Admittance Curves

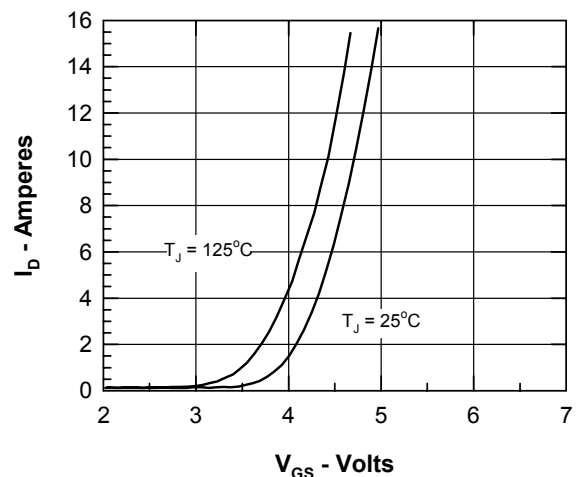


Figure 7. Gate Charge

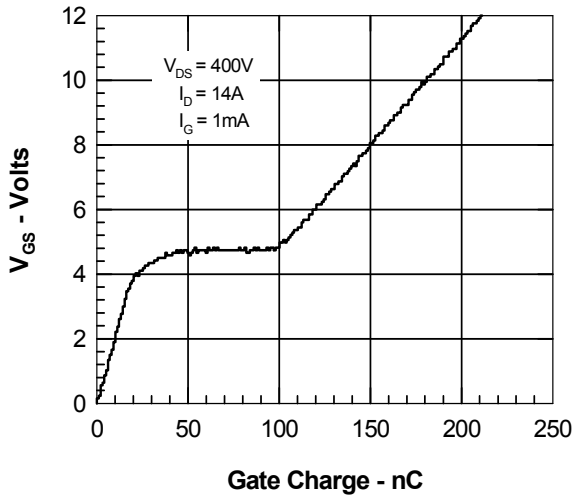


Figure 8. Capacitance Curves

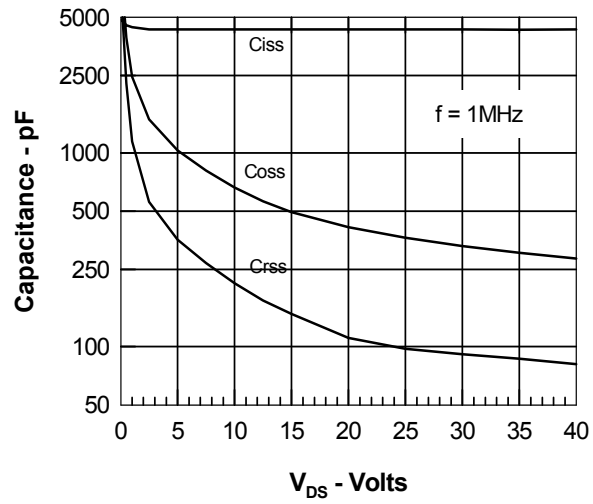


Figure 9. Source Current vs. Source to Drain Voltage

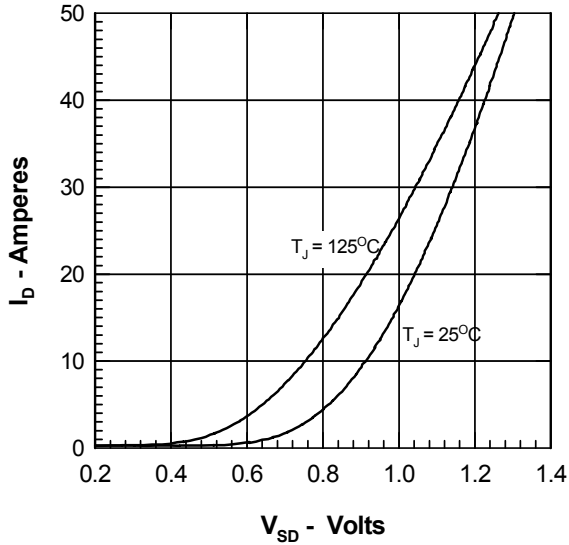
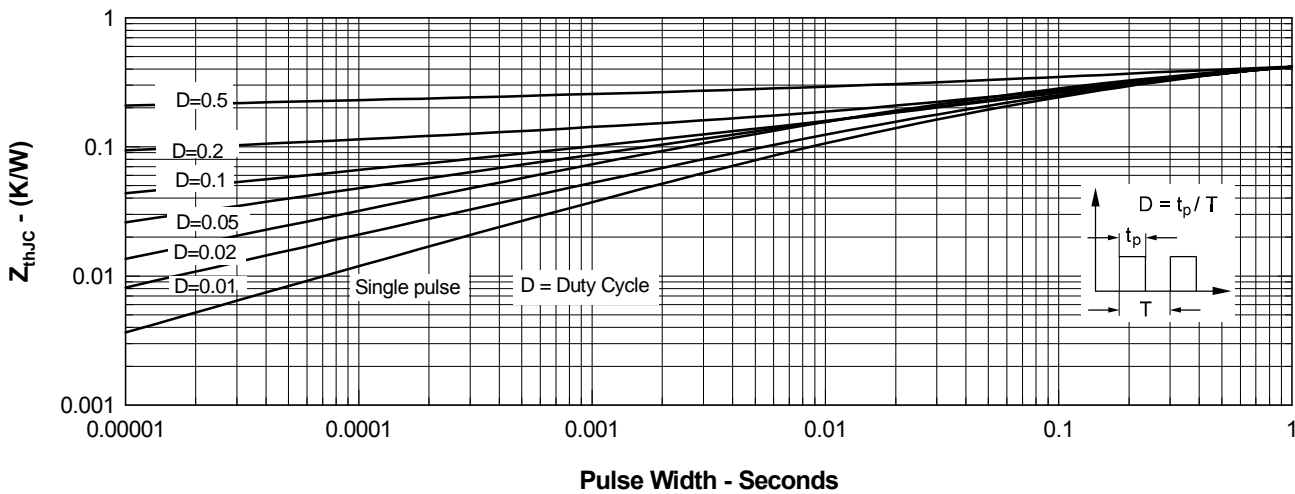


Figure 11. Transient Thermal Resistance



IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1
4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	



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