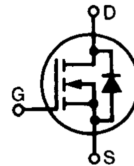
IXYS

Preliminary Data Sheet

HiPerFET™ Power MOSFETs

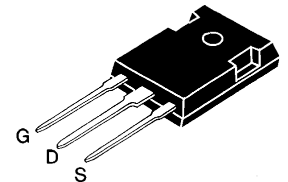
N-Channel Enhancement Mode
High dv/dt, Low t_{rr}, HDMOS™ Family

	V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
IXFH8N80	800V	8A	1.1Ω	250 ns
IXFH9N80	800V	9A	0.9Ω	250 ns

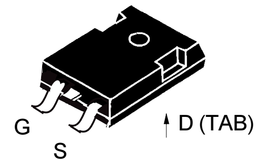


Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ		800	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	8N80	8	A
		9N80	9	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	8N80	32	A
		9N80	36	A
I_{AR}	T_C = 25°C	8N80	8	A
		9N80	9	A
E_{AR}	T_C = 25°C		18	mJ
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$, $T_J \le$ 150°C, R_G = 2 Ω		5	V/ns
P_D	T_C = 25°C		180	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
M_d	Mounting torque		1.13/10 Nm/lb.in.	
Weight			TO-204 = 18 g, TO-247 = 6 g	
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s			300	°C

TO-247 AD (IXFH)



TO-247 SMD*



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

*Add suffix letter "S" for surface mountable package

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3 mA		800			V
	V_{DSS} temperature coefficient			0.088		%/K
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 2.5 mA		2		4.5	V
	$V_{GS(th)}$ temperature coefficient			-0.257		%/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}	8N80			1.1	Ω
	Pulse test, t ≤ 300 µs, duty cycle δ ≤ 2%	9N80			0.9	Ω

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)
- Space savings
- High power density

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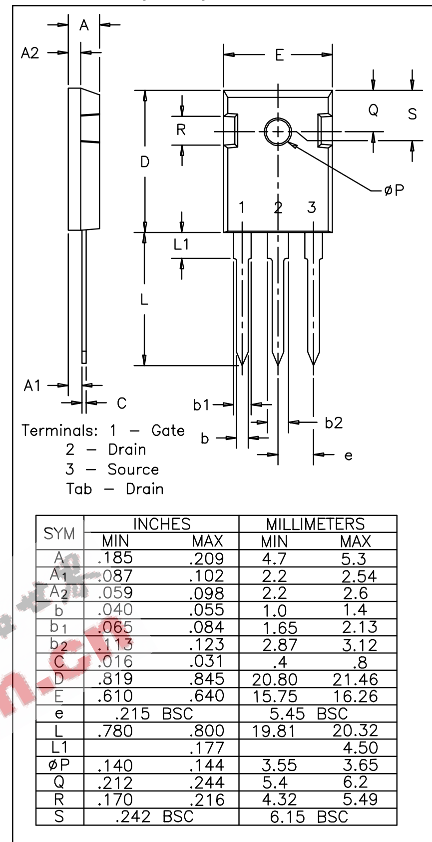
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 • I_{D25}, pulse test	4	7		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2600		pF
C_{oss}			240		pF
C_{rss}			60		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		35		ns
t_r	R_G = 4.7 Ω (External)		15		ns
$t_{d(off)}$			70		ns
t_f			35		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		85	130	nC
Q_{gs}			15	30	nC
Q_{gd}			40	70	nC
R_{thJC}				0.7	K/W
R_{thCK}			0.25		K/W

TO-247 AD (IXFH) Outline

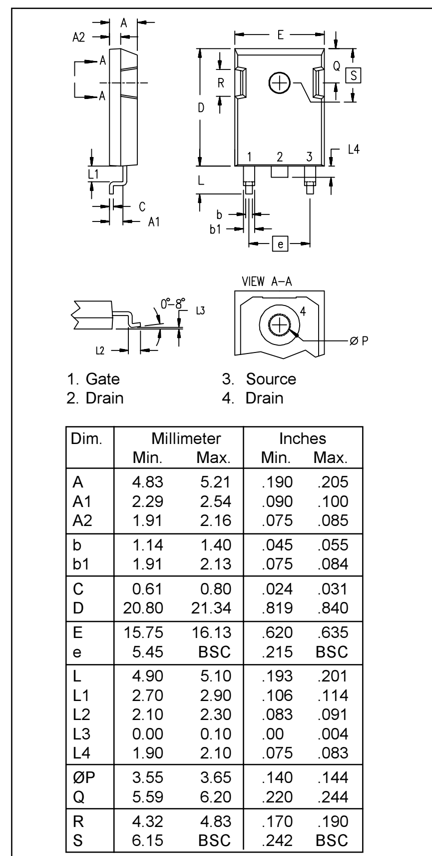


SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.7	5.3
A1	.087	.102	2.2	2.54
A2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b1	.065	.084	1.65	2.13
b2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
ØP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

Source-Drain Diode

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0		8N80		8	A
			9N80		9	A
I_{SM}	Repetitive; pulse width limited by T_{JM}		8N80		32	A
			9N80		36	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle δ ≤ 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}		T_J = 25°C		0.5		µC
		T_J = 125°C		1.0		µC
I_{RM}		T_J = 25°C		7.5		A
		T_J = 125°C		9.0		A

TO-247 SMD Outline



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b1	1.91	2.13	.075	.084
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	4.90	5.10	.193	.201
L1	2.70	2.90	.106	.114
L2	2.10	2.30	.083	.091
L3	0.00	0.10	.00	.004
L4	1.90	2.10	.075	.083
ØP	3.55	3.65	.140	.144
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190
S	6.15	BSC	.242	BSC

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 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

Figure 1. Output Characteristics at 25°C

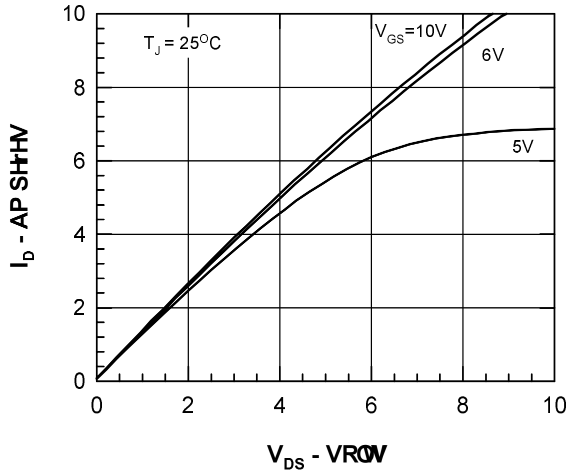


Figure 2. Output Characteristics at 125°C

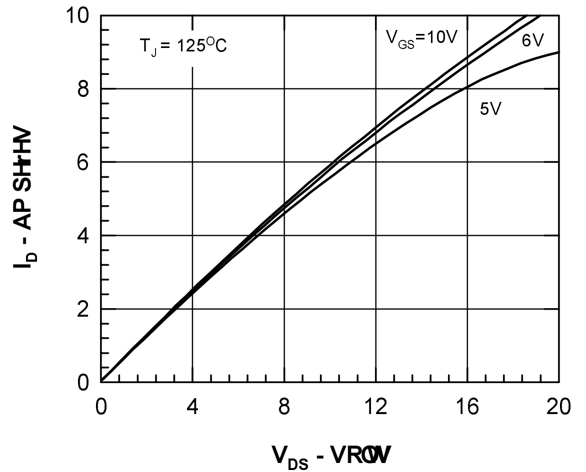


Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

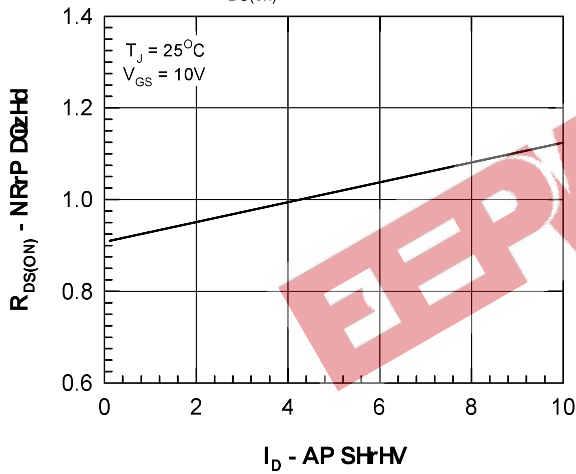


Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J

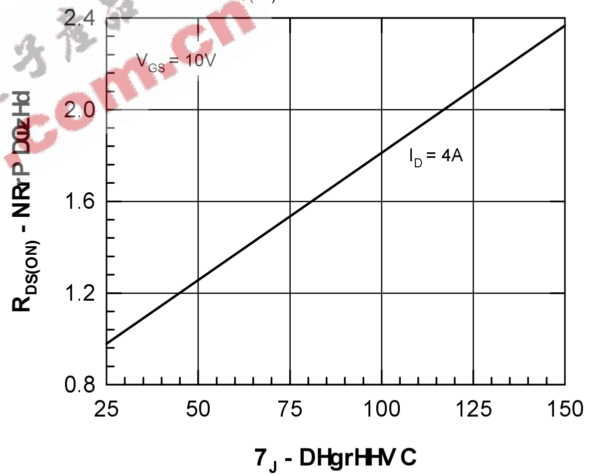


Figure 5. Drain Current vs. Case Temperature

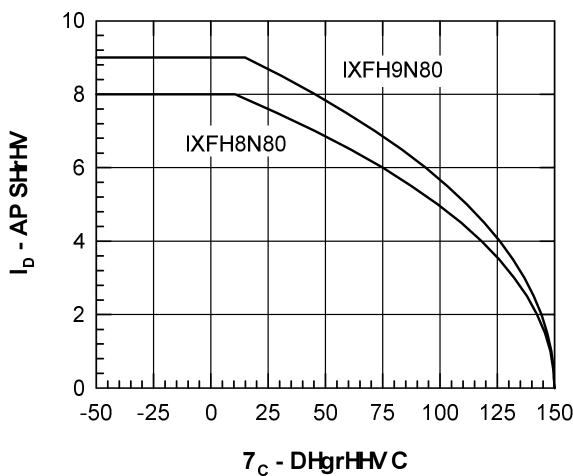


Figure 6. Admittance Curves

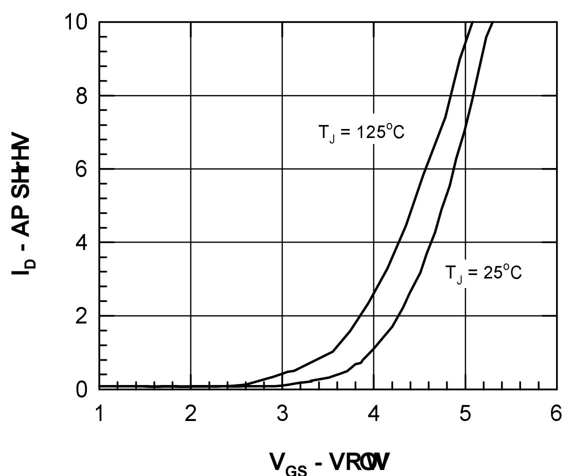


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Figure 7. Gate Charge

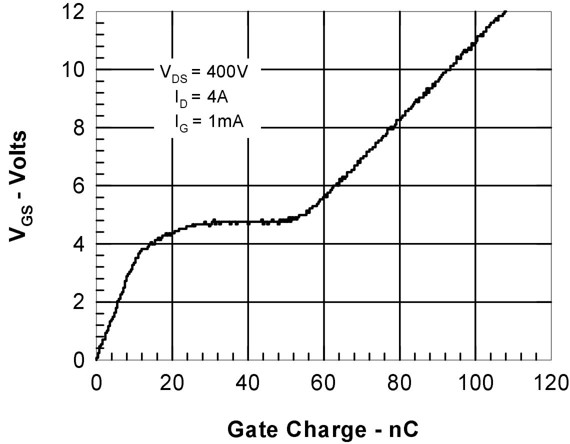


Figure 8. Capacitance Curves

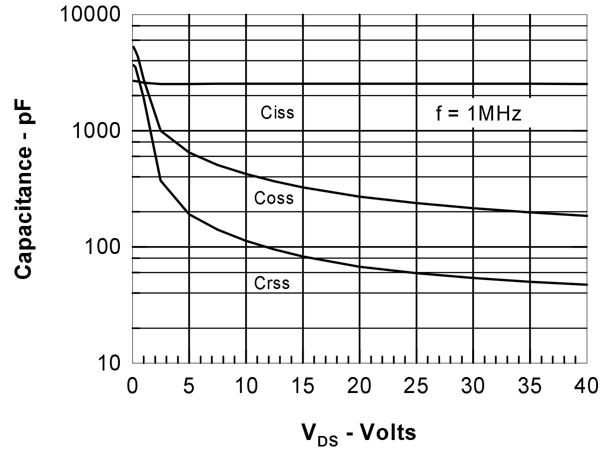


Figure 9. Forward Voltage Drop of the Intrinsic Diode

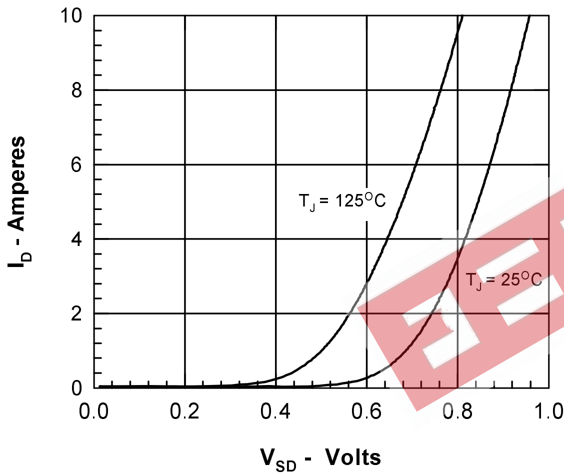


Figure10. Forward Bias Safe Operating Area

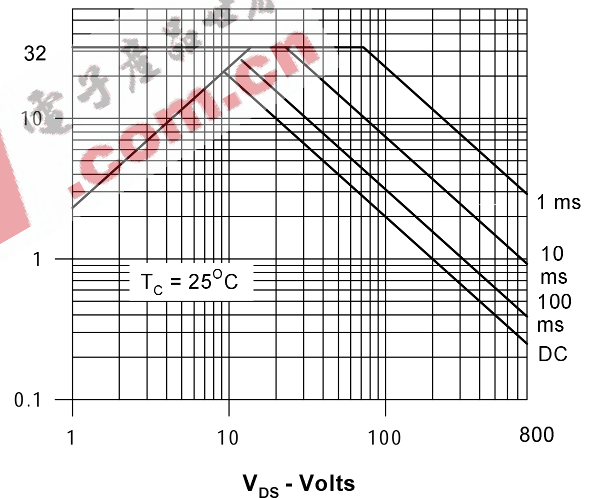
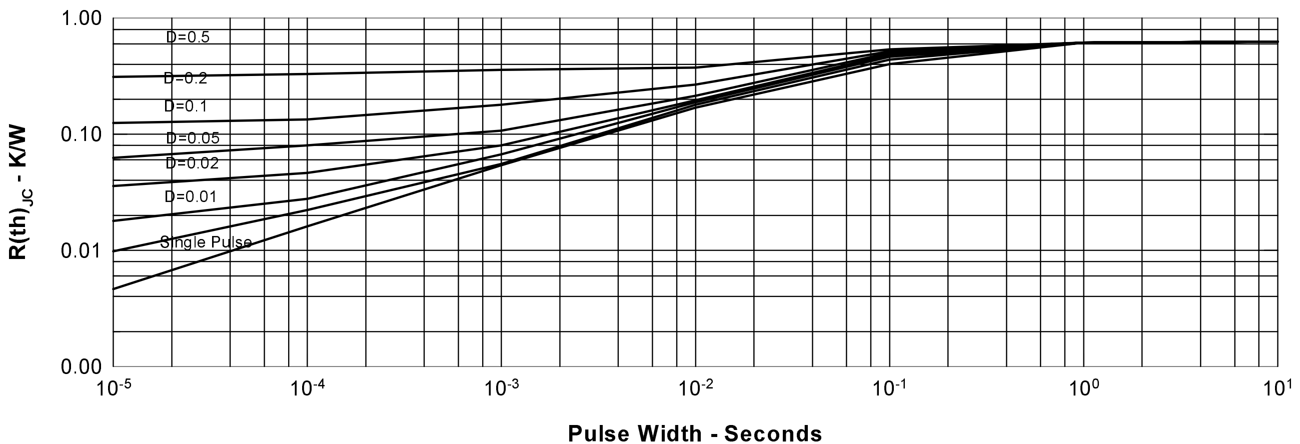


Figure 11. Transient Thermal Resistance



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