IXYS

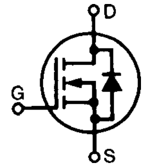
HiPerFET™ Power MOSFET

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

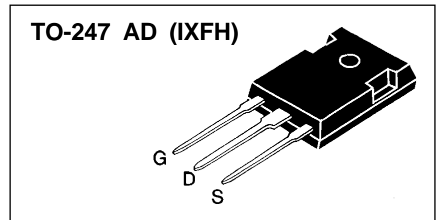
	V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
IXFH/IXFM 11N80	800 V	11 A	0.95 Ω	250 ns
IXFH/IXFM 13N80	800 V	13 A	0.80 Ω	250 ns
IXFH/IXFM 14N80	800 V	14 A	0.70 Ω	250 ns
IXFH/IXFM 15N80	800 V	15 A	0.60 Ω	250 ns

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	11N80	11	A
		13N80	13	A
		14N80	14	A
		15N80	15	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	11N80	44	A
		13N80	52	A
		14N80	56	A
		15N80	60	A
I_{AR}	T_C = 25°C	11N80	11	A
		13N80	13	A
		14N80	14	A
		15N80	15	A
E_{AR}	T_C = 25°C		30	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		300	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

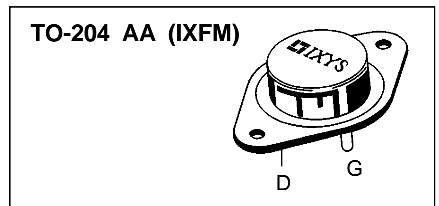
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3 mA		800			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4 mA		2.0		4.5	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	V_{DS} = 0.8 V_{DSS}	T_J = 25°C			250	µA
	V_{GS} = 0 V	T_J = 125°C			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25}	11N80			0.95	Ω
		13N80			0.80	Ω
		14N80			0.70	Ω
		15N80			0.60	Ω
	Pulse test, t ≤ 300 µs, duty cycle δ ≤ 2 %					



TO-247 AD (IXFH)



TO-204 AA (IXFM)



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 (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

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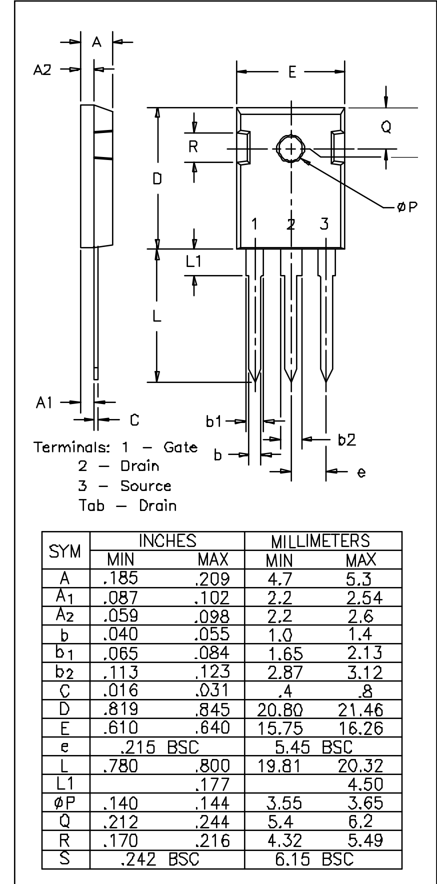
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 I_{D25}, pulse test	8	14		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		4200		pF
C_{oss}			360		pF
C_{rss}			100		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		20	50	ns
t_r	R_G = 2 Ω (External)		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

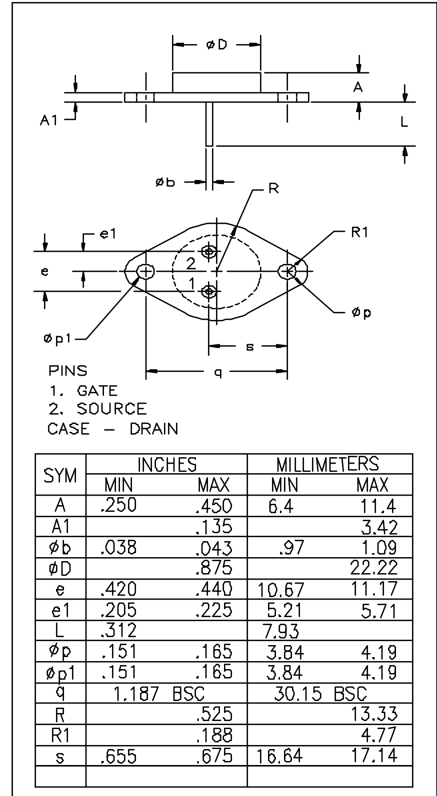
Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
I_S	V_{GS} = 0	11N80			11	A
		13N80			13	A
		14N80			14	A
		15N80			15	A
I_{SM}	Repetitive pulse width limited by T_{JM}	11N80			44	A
		13N80			52	A
		14N80			56	A
		15N80			60	A
V_{SD}	$I_F = I_S$, 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}				1		µC
I_{RM}				8.5		A

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	

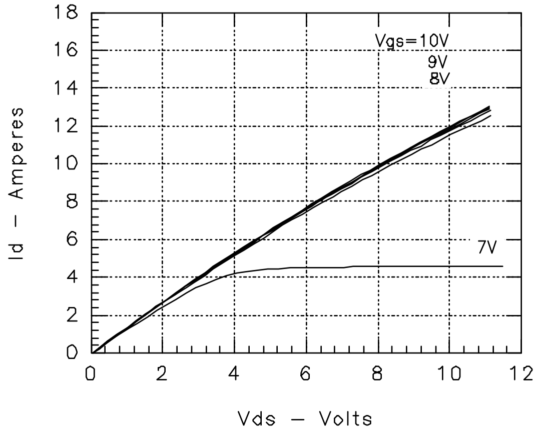
TO-204 AA (IXFM) Outline

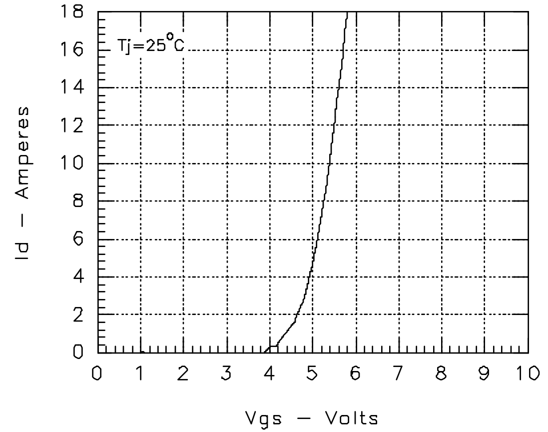


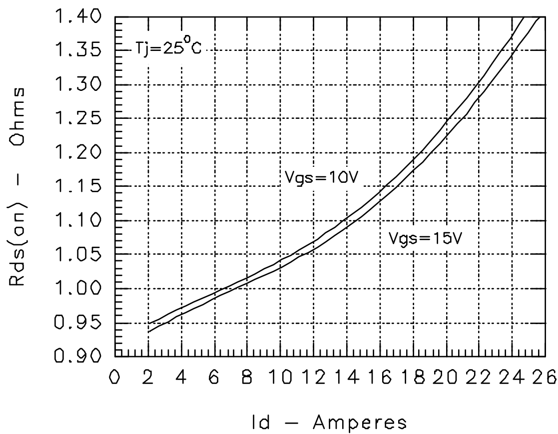
SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.250	.450	6.4	11.4
A1		.135		3.42
Øb	.038	.043	.97	1.09
ØD		.875		22.22
e	.420	.440	10.67	11.17
e1	.205	.225	5.21	5.71
L	.312		7.93	
Øp	.151	.165	3.84	4.19
Øp1	.151	.165	3.84	4.19
q	1.187 BSC		30.15 BSC	
R		.525		13.33
R1		.188		4.77
s	.655	.675	16.64	17.14

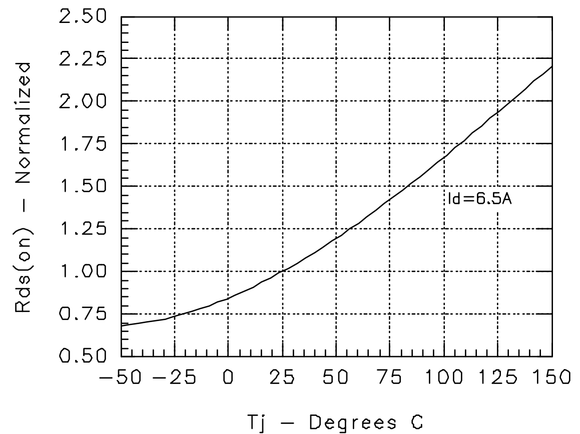
IXYS reserves the right to change limits, test conditions, and dimensions.

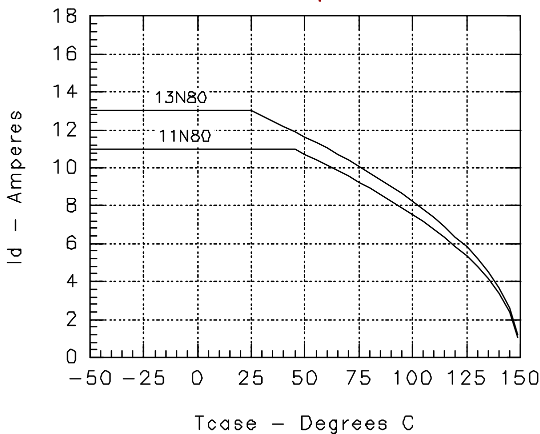
IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents:
4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

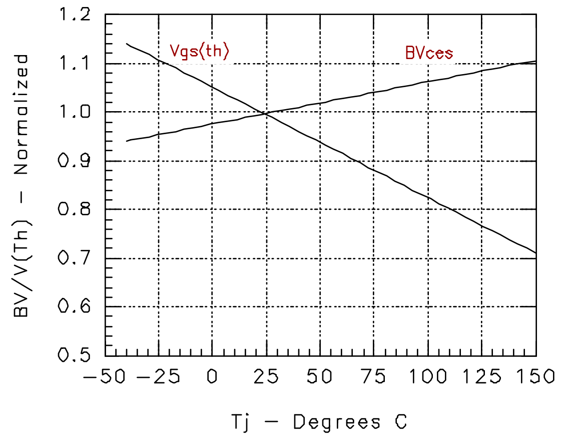












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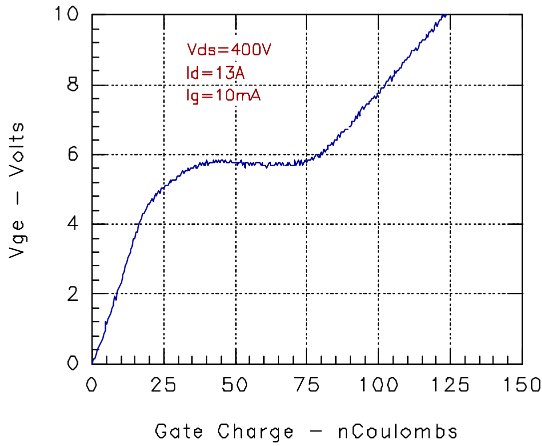

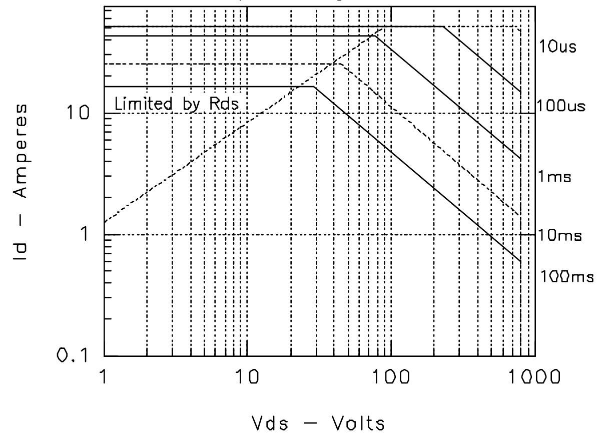

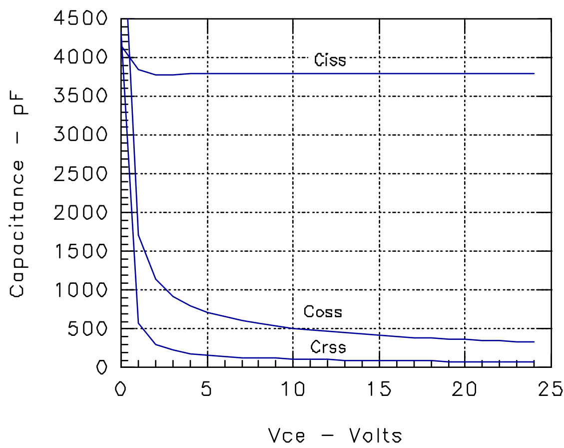

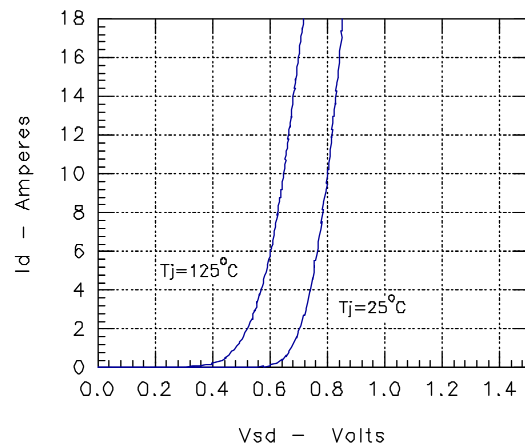

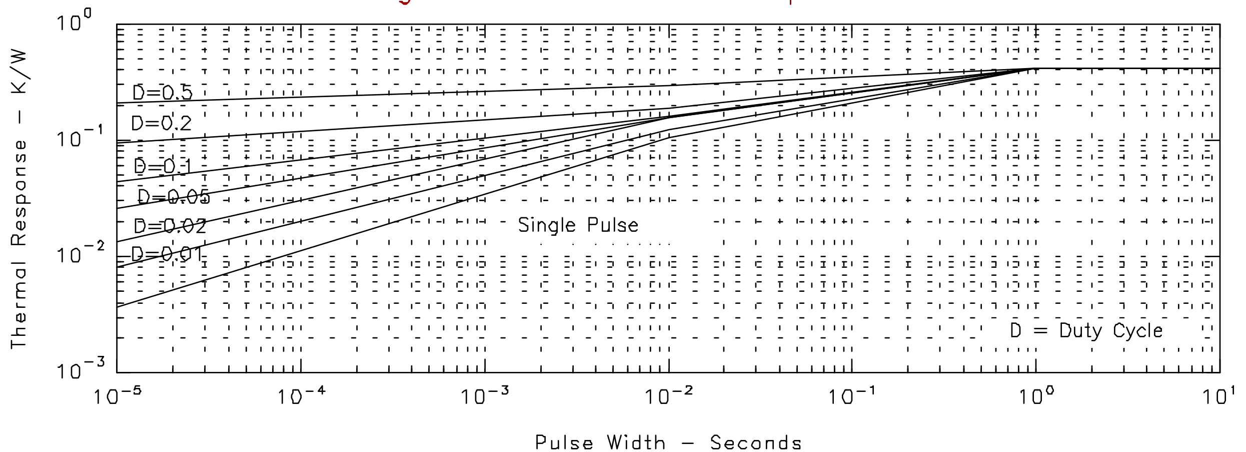

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