

HiPerFET™

Power MOSFETs

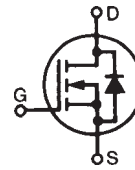
N-Channel Enhancement Mode
High dv/dt, Low t_{rr} , HDMOS™ Family

Preliminary data sheet

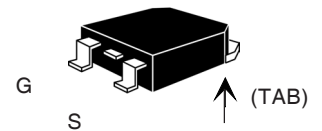
IXFT 10 N100
IXFT 12 N100

V_{DSS}	I_{D25}	$R_{DS(on)}$
1000 V	10 A	1.20 Ω
1000 V	12 A	1.05 Ω

$t_{rr} \leq 250$ ns



TO-268 Case Style



G = Gate,
S = Source,
TAB = Drain

Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	1000		V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ M Ω	1000		V
V_{GS}	Continuous	± 20		V
V_{GSM}	Transient	± 30		V
I_{D25}	$T_C = 25^\circ\text{C}$	10N100	10	A
		12N100	12	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	10N100	40	A
		12N100	48	A
I_{AR}	$T_C = 25^\circ\text{C}$	10N100	10	A
		12N100	12	A
E_{AR}	$T_C = 25^\circ\text{C}$	30		mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/ μ s, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω	5		V/ns
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		TO-268 = 6 g		

Features

- International standard package
- 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

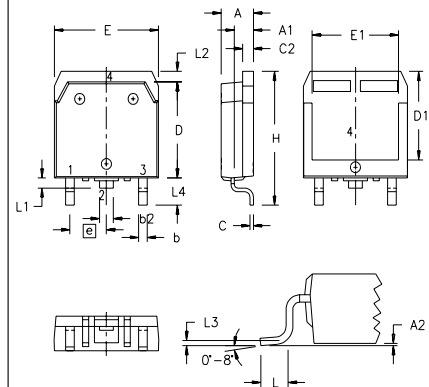
- Surface mountable, high power package
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0$ V, $I_D = 3$ mA	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4$ mA	2.0		4.5 V
I_{GSS}	$V_{GS} = \pm 20$ V _{DC} , $V_{DS} = 0$			± 100 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0$ V			250 μ A 1 mA
$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 0.5 \cdot I_{D25}$			1.20 Ω 1.05 Ω
	Pulse test, $t \leq 300$ μ s, duty cycle $d \leq 2$ %			

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test	6	10	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		4000	pF
C_{oss}			310	pF
C_{rss}			70	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 2\ \Omega$ (External),		21	ns
t_r			33	ns
$t_{d(off)}$			62	ns
t_f			32	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		122	nC
Q_{gs}			30	nC
Q_{gd}			50	nC
R_{thJC}			0.42	K/W

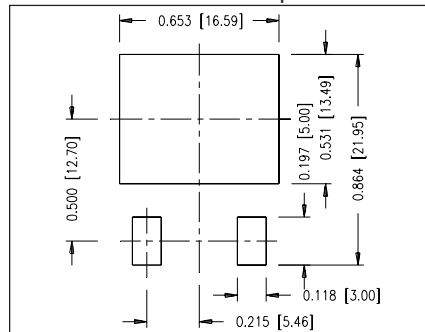
Source-Drain Diode		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$	10N100 12N100		10 12 A
I_{SM}	Repetitive; pulse width limited by T_{JM}	10N100 12N100		40 48 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V},$ Pulse 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}		$T_J = 25^\circ\text{C}$	1	μC
		$T_J = 125^\circ\text{C}$	2	μC
I_{RM}		$T_J = 25^\circ\text{C}$	10	A
		$T_J = 125^\circ\text{C}$	15	A

TO-268 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

Min Recommended Footprint



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

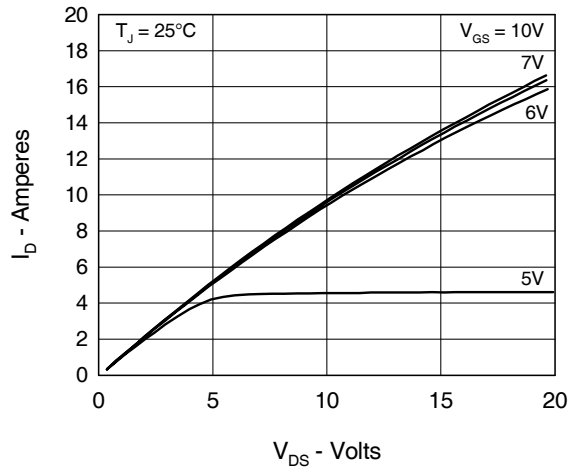
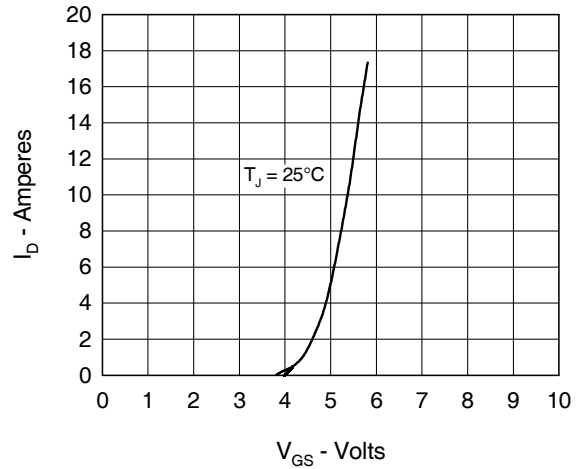
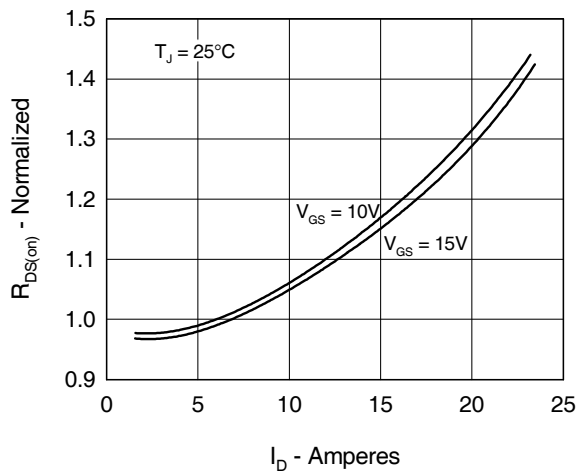
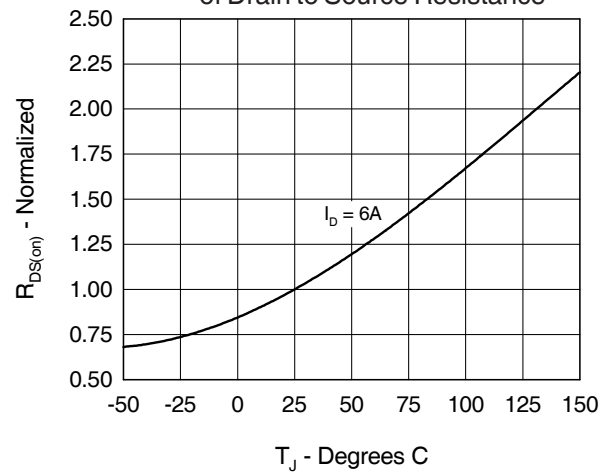
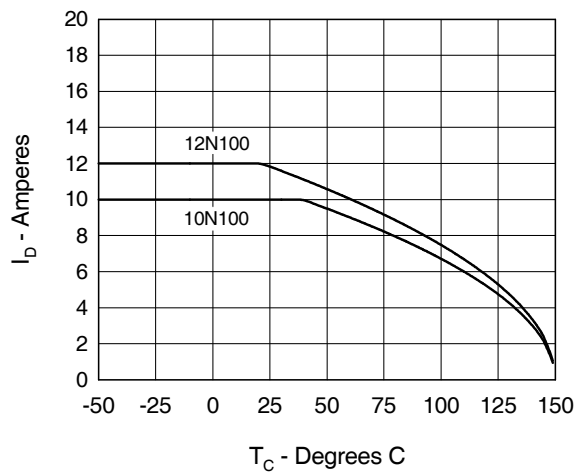
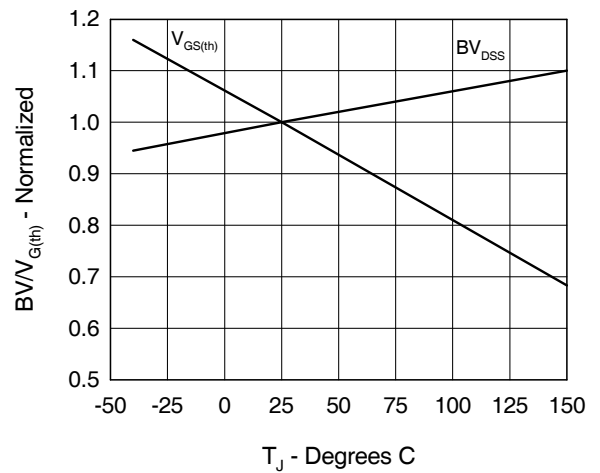
Fig. 1. Output Characteristics

Fig. 2. Input Admittance

Fig. 3. $R_{DS(on)}$ vs. Drain Current

Fig. 4. Temperature Dependence of Drain to Source Resistance

Fig. 5. Drain vs. Case Temperature

Fig. 6. Temperature Dependence of Breakdown and Threshold Voltage


Fig. 7. Gate Charge Characteristic Curve

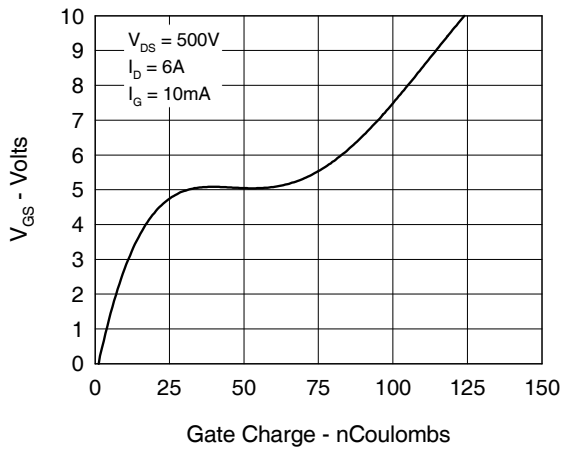


Fig. 8. Capacitance Curves

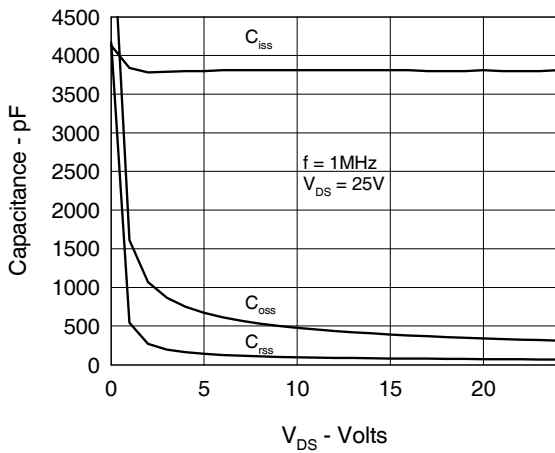


Fig. 9. Source Current vs. Source to Drain Voltage

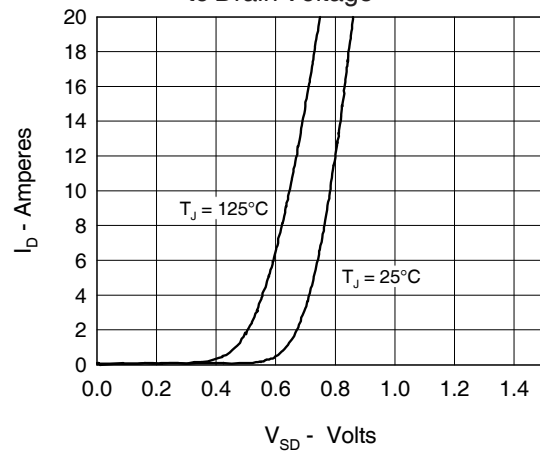
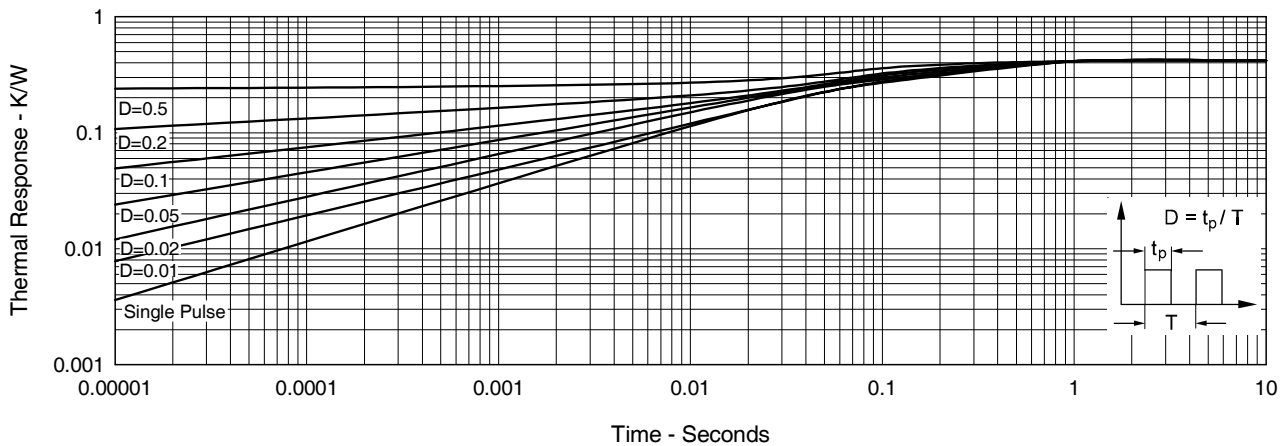


Fig.10.

Transient Thermal Impedance



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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 6,259,123B1 6,306,728B1
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343 6,583,505



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