

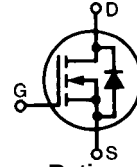
HiPerFET™

Power MOSFETs

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

Preliminary data sheet

IXFT10N100
IXFT12N100
IXFT13N100

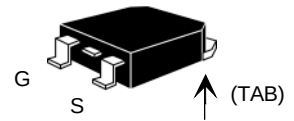


V_{DSS}	I_{D25}	$R_{DS(on)}$
1000 V	10 A	1.20 Ω
1000 V	12 A	1.05 Ω
1000 V	12.5 A	0.90 Ω

$t_{rr} \leq 250$ ns

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 ; $R_{GS} = 1\text{ M}\Omega$	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
		13N100	12.5	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	10N100	40	A
		12N100	48	A
		13N100	50	A
I_{AR}	$T_C = 25^\circ\text{C}$	10N100	10	A
		12N100	12	A
		13N100	12.5	A
E_{AR}	$T_C = 25^\circ\text{C}$	30	mJ	
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2\text{ }\Omega$	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		

TO-268 Case Style



G = Gate,
S = Source,
TAB = Drain

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

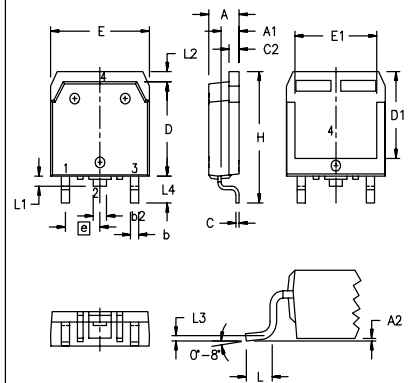
Advantages

- 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}	$V_{GS} = 0\text{ V}$, $I_D = 3\text{ mA}$	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4\text{ mA}$	2.0		4.5 V
I_{GSS}	$V_{GS} = \pm 20\text{ V}_{DC}$, $V_{DS} = 0$			± 100 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$	$T_J = 25^\circ\text{C}$		250 μA
	$V_{GS} = 0\text{ V}$	$T_J = 125^\circ\text{C}$		1 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 0.5 \cdot I_{D25}$	10N100		1.20 Ω
		12N100		1.05 Ω
		13N100		0.90 Ω
		Pulse test, $t \leq 300\text{ }\mu\text{s}$, 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	50 ns
t_r			33	50 ns
$t_{d(off)}$			62	100 ns
t_f			32	50 ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		122	155 nC
Q_{gs}			30	45 nC
Q_{gd}			50	80 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 13N100		10 A 12 A 12.5 A
I_{SM}	Repetitive; pulse width limited by T_{JM}	10N100 12N100 13N100		40 A 48 A 50 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-268AA (D³ PAK)


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.9	5.1	.193	.201
A ₁	2.7	2.9	.106	.114
A ₂	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b ₂	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E ₁	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L ₁	1.20	1.40	.047	.055
L ₂	1.00	1.15	.039	.045
L ₃	0.25 BSC		.010 BSC	
L ₄	3.80	4.10	.150	.161

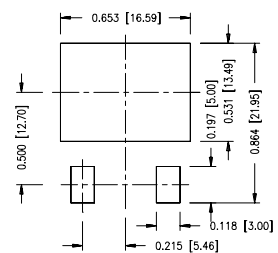
Min. Recommended Footprint


Fig. 1. Output Characteristics

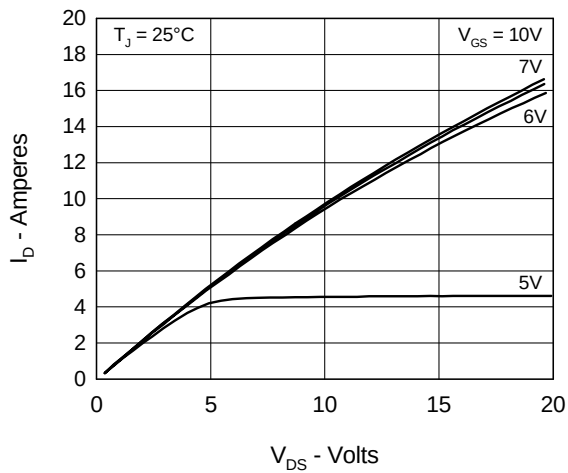


Fig. 2. Input Admittance

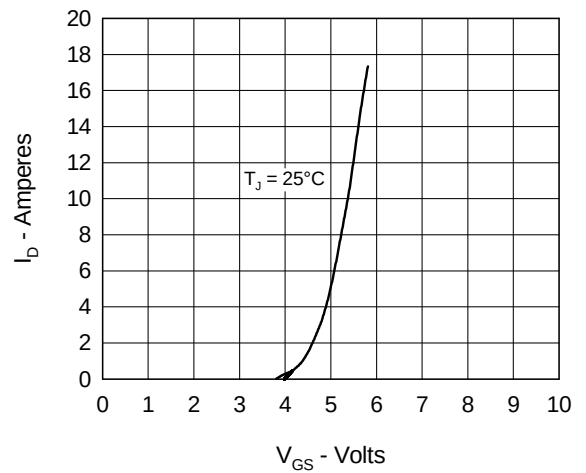
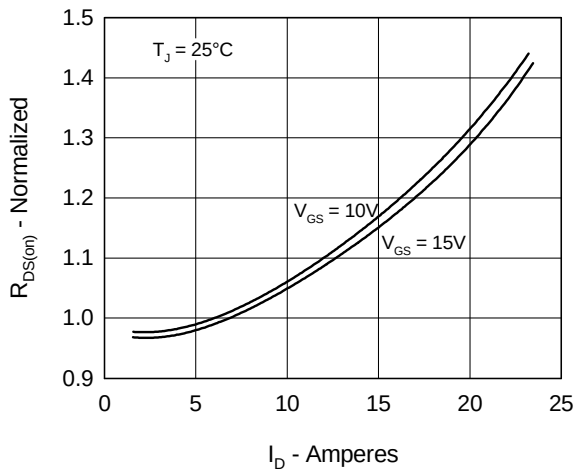

Fig. 3. $R_{DS(on)}$ vs. Drain Current


Fig. 4. Temperature Dependence of Drain to Source Resistance

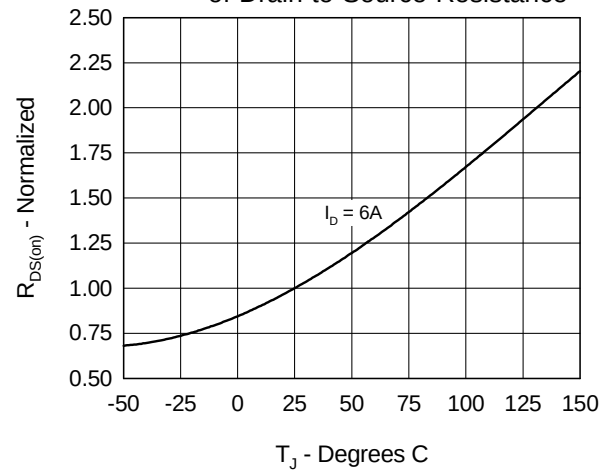


Fig. 5. Drain vs. Case Temperature

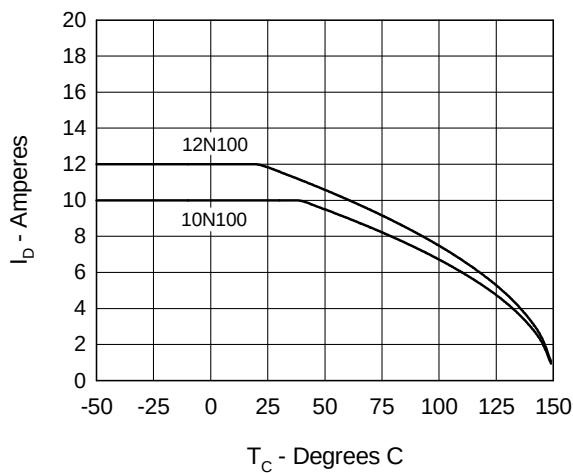


Fig. 6. Temperature Dependence of Breakdown and Threshold Voltage

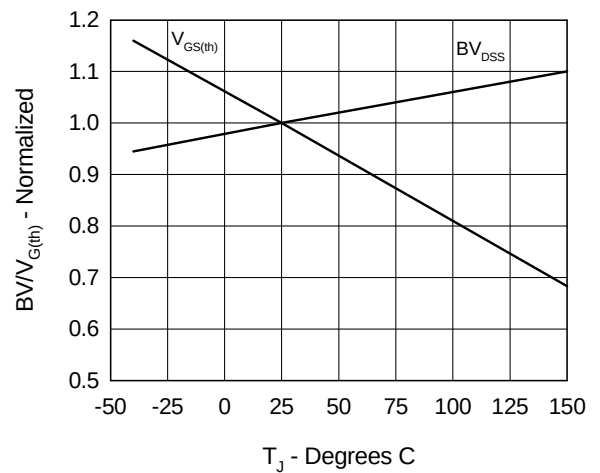


Fig. 7. Gate Charge Characteristic Curve

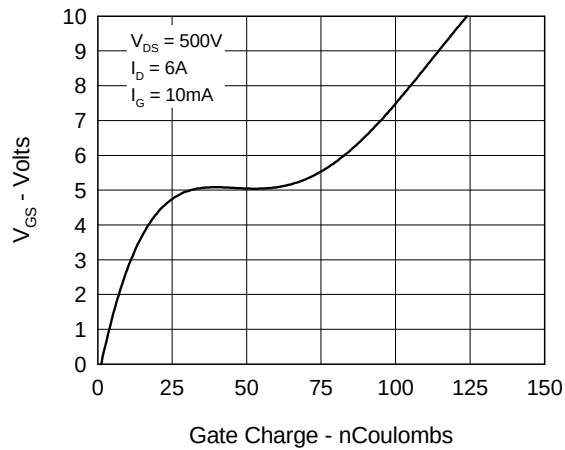


Fig. 8. Capacitance Curves

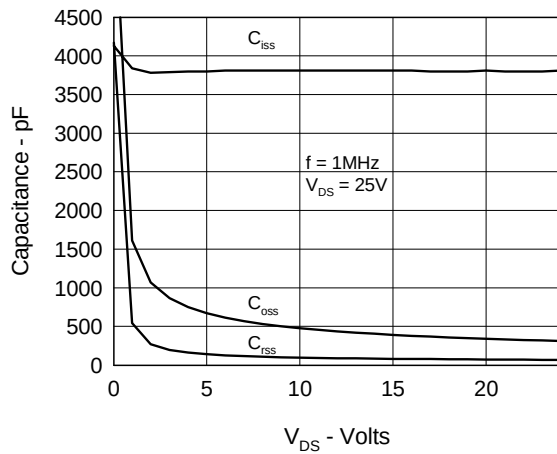


Fig. 9. Source Current vs. Source to Drain Voltage

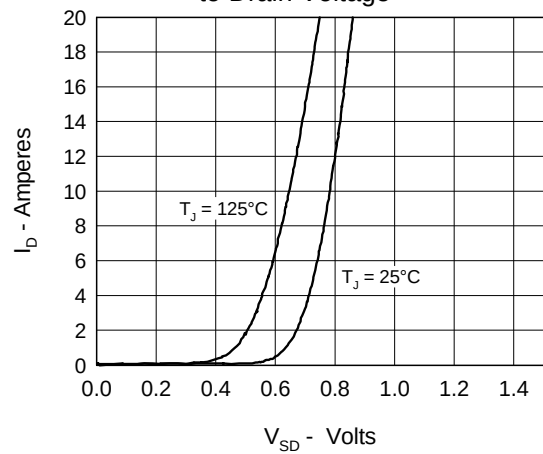


Fig.10. Transient Thermal Impedance

