IXYS

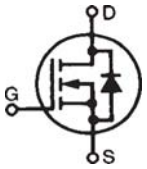
Advance Technical Information

High Voltage Power MOSFET

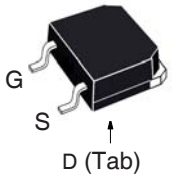
IXTT3N200P3HV
IXTH3N200P3HV

V_{DSS} = 2000V
I_{D25} = 3A
$R_{DS(on)}$ ≤ 8Ω

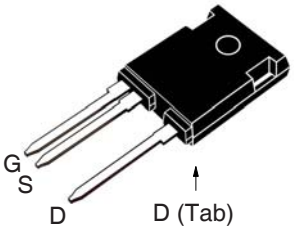
N-Channel Enhancement Mode



TO-268HV (IXTT)



TO-247HV (IXTH)



G = Gate D = Drain
S = Source Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	2000	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	2000	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	3.0	A
I_{D110}	T_C = 110°C	2.6	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	9.0	A
P_D	T_C = 25°C	520	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque	1.13/10	Nm/lb.in
Weight	TO-268HV	4	g
	TO-247HV	6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	2000			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	3.0		5.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			10	μA
	T_J = 125°C			250	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 1.5A, Note 1			8	Ω

Features

- High Blocking Voltage
- High Voltage Packages

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- High Voltage Power Supplies
- Capacitor Discharge Applications
- Pulse Circuits
- Laser and X-Ray Generation Systems

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Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 50V, I_D = 1.5A, Note 1	2.3	3.8		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1860		pF
C_{oss}			133		pF
C_{rss}			58		pF
R_{Gi}	Gate Input Resistance		3.8		Ω
$t_{d(on)}$	**Resistive Switching Times**		21		ns
t_r	V_{GS} = 10V, V_{DS} = 500V, I_D = 0.5 • I_{D25}		27		ns
$t_{d(off)}$	R_G = 5Ω (External)		67		ns
t_f			60		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 1kV, I_D = 0.5 • I_{D25}		70		nC
Q_{gs}			8		nC
Q_{gd}			39		nC
R_{thJC}				0.24	°C/W
R_{thCS}	TO-247HV		0.21		°C/W

Source-Drain Diode

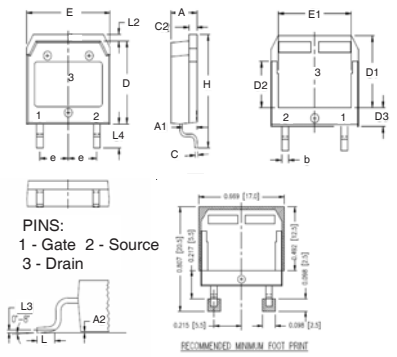
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			3	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			12	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 1.5A, -di/dt = 100A/μs		420		ns
Q_{RM}	V_R = 100V, V_{GS} = 0V		380		nC
I_{RM}			1.8		A

Note: 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

ADVANCE TECHNICAL INFORMATION

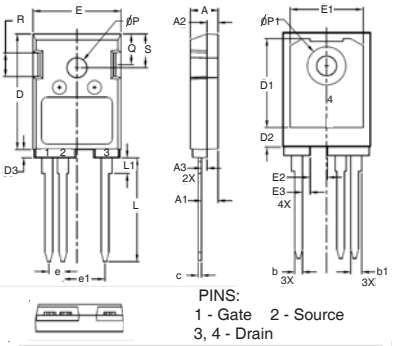
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

TO-268HV Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER 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
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.465	.476	11.80	12.10
D2	.295	.307	7.50	7.80
D3	.114	.126	2.90	3.20
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	.067	.079	1.70	2.00
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

TO-247HV Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.193	.201	4.90	5.10
A1	.114	.122	2.90	3.10
A2	.075	.083	1.90	2.10
A3	.035	.043	0.90	1.10
b	.053	.059	1.35	1.50
b1	.075	.083	1.90	2.10
c	.022	.030	0.55	0.75
D	.819	.843	20.80	21.40
D1	.638	.646	16.20	16.40
D2	.134	.146	3.40	3.70
D3	.055	.063	1.40	1.60
E	.622	.638	15.80	16.20
E1	.520	.528	13.20	13.40
E2	.118	.126	3.00	3.20
E3	.051	.059	1.30	1.50
e	.100 BSC		2.54 BSC	
e1	.300 BSC		7.62 BSC	
L	.732	.748	18.60	19.00
L1	.106	.118	2.70	3.00
øP	.138	.142	3.50	3.60
øP1	.272	.280	6.90	7.10
Q	.216	.224	5.50	5.70
R	.165	.169	4.20	4.30
S	.240	.248	6.10	6.30

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

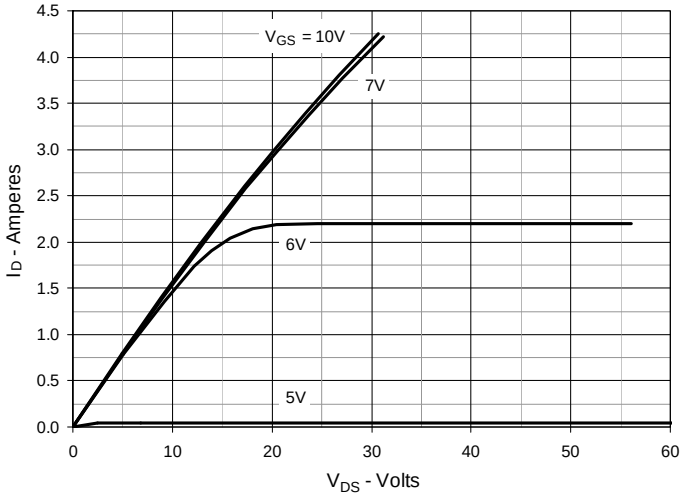


Fig. 2. Output Characteristics @ T_J = 125ºC

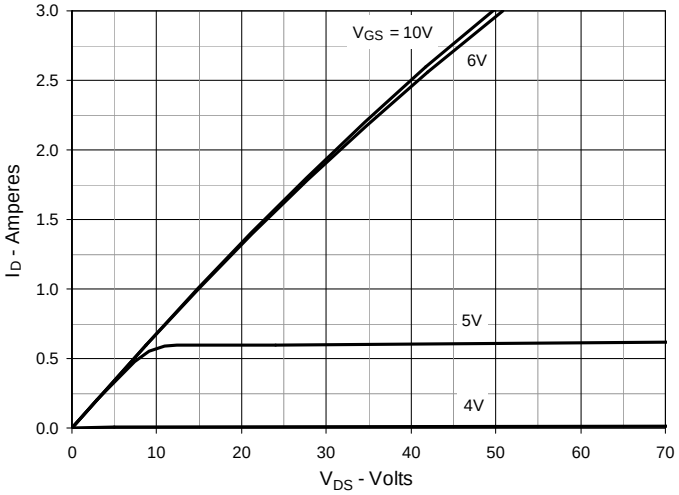


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 1.5A Value vs. Junction Temperature

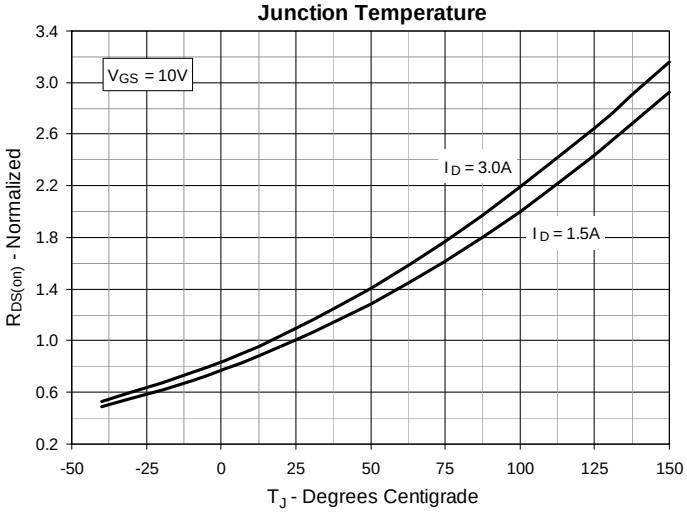


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 1.5A Value vs. Drain Current

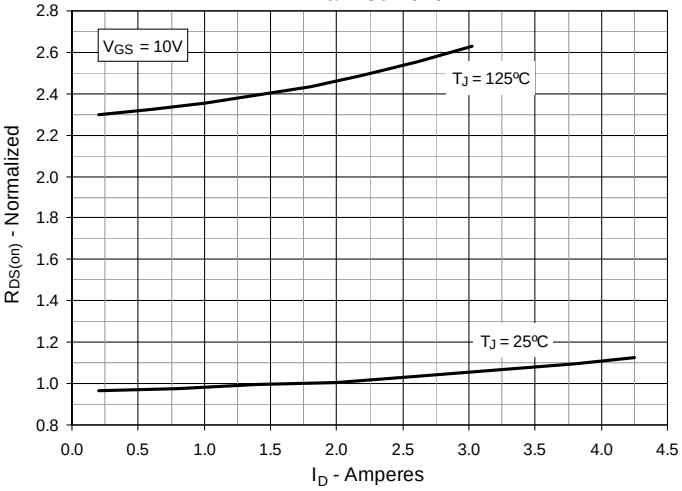


Fig. 5. Maximum Drain Current vs. Case Temperature

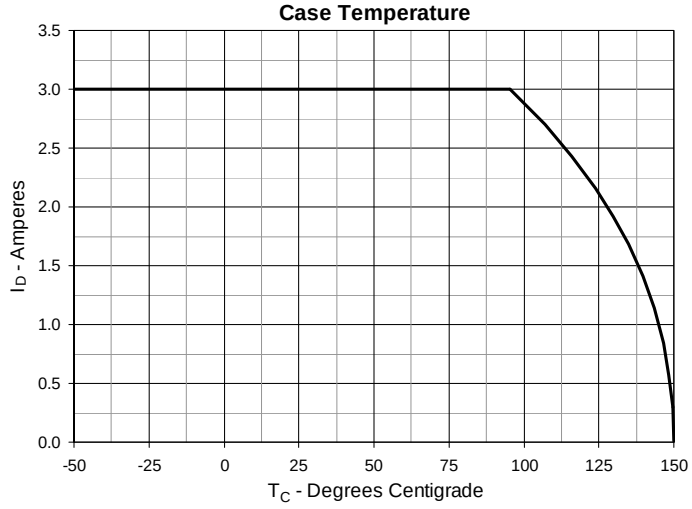
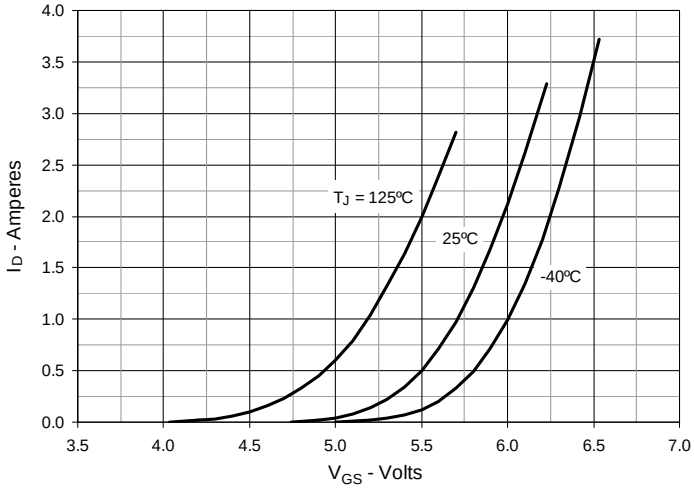


Fig. 6. Input Admittance



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Fig. 7. Transconductance

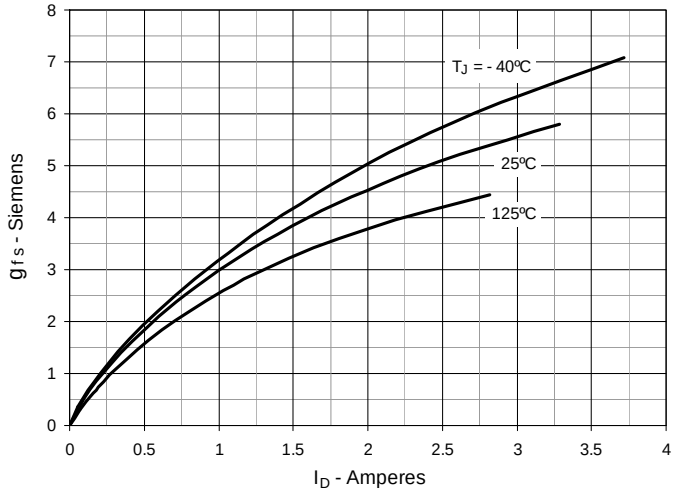


Fig. 8. Forward Voltage Drop of Intrinsic Diode

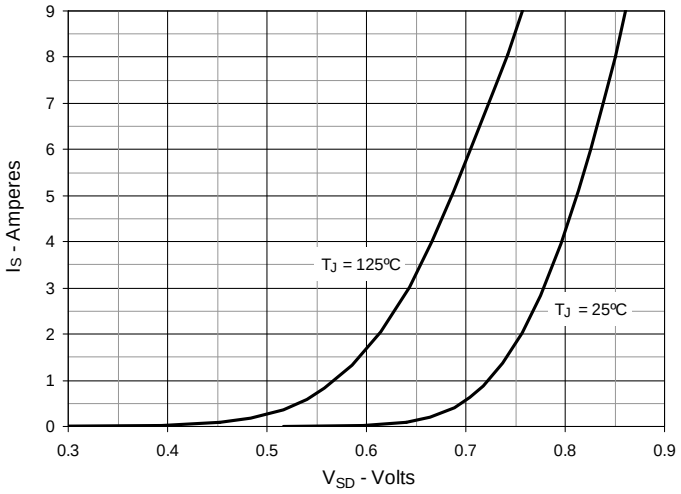


Fig. 9. Gate Charge

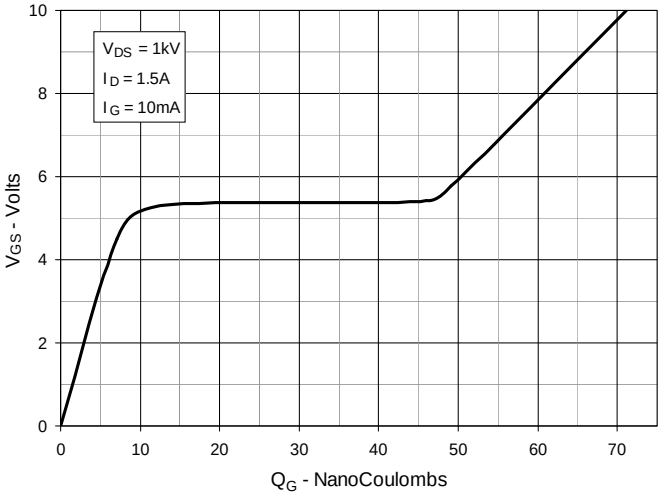


Fig. 10. Capacitance

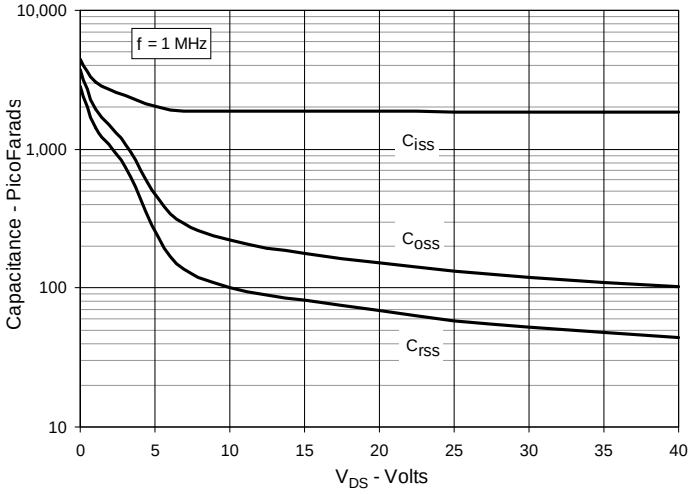


Fig. 11. Forward-Bias Safe Operating Area

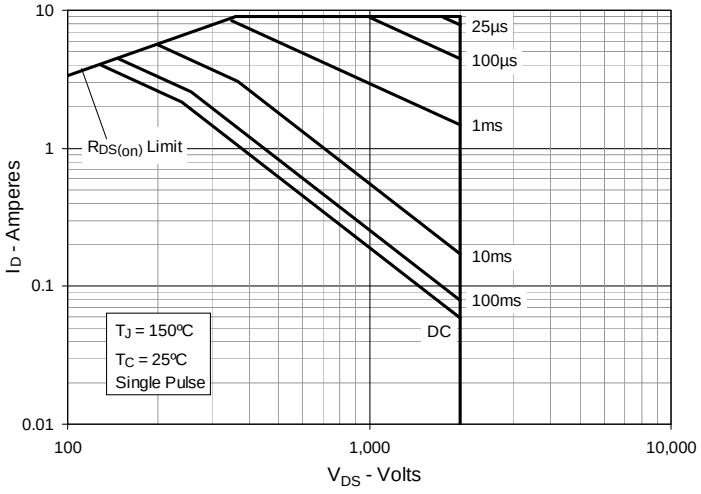
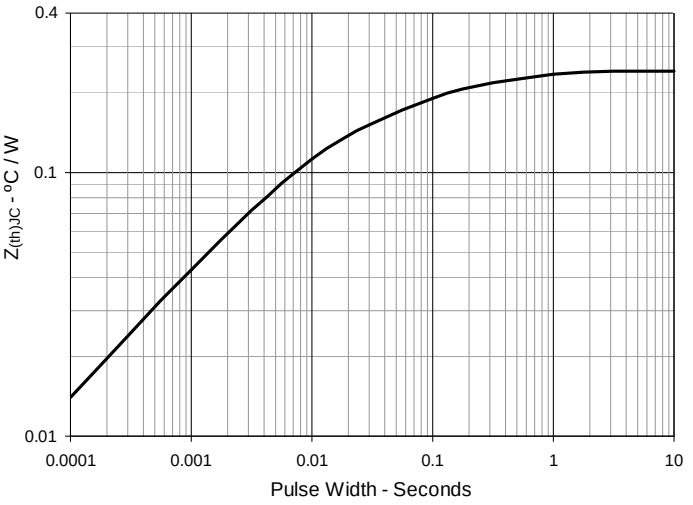


Fig. 12 Maximum Transient Thermal Impedance



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