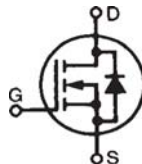# ⌐IXYS

High Voltage Power MOSFET
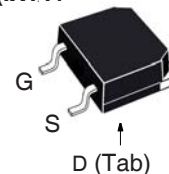
IXTT02N450HV
IXTH02N450HV

V_{DSS} = 4500V
I_{D25} = 200mA
$R_{DS(on)}$ ≤ 625Ω
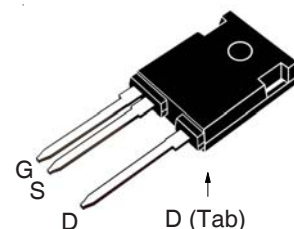
N-Channel Enhancement Mode

TO-268HV (IXTT)

G
S
D (Tab)

TO-247HV (IXTH)

G
S
D   D (Tab)

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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	4500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	4500	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	200	mA
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	600	mA
P_D	T_C = 25°C	113	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

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

Symbol	Test Conditions	Characteristic Values			
(T_J = 25°C, Unless Otherwise Specified)		Min.	Typ.	Max.	
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	4.0		6.5	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
I_{DSS}	V_{DS} = 3.6kV, V_{GS} = 0V			5	µA
	V_{DS} = 4.5kV			10	µA
	V_{DS} = 3.6kV T_J = 125°C		15		µA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 10mA, Note 1			625	Ω

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	V_{DS} = 50V, I_D = 50mA, Note 1	90	150	mS
C_{iss}			246	pF
C_{oss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		19	pF
C_{rss}			5.8	pF
R_{Gi}	Gate Input Resistance		76	Ω
$t_{d(on)}$	**Resistive Switching Times**		17	ns
t_r			48	ns
$t_{d(off)}$	V_{GS} = 10V, V_{DS} = 500V, I_D = 0.5 • I_{D25}		28	ns
t_f	R_G = 10Ω (External)		143	ns
$Q_{g(on)}$			10.6	nC
Q_{gs}	V_{GS} = 10V, V_{DS} = 1kV, I_D = 0.5 • I_{D25}		3.3	nC
Q_{gd}			5.5	nC
R_{thJC}				1.1 °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			200 mA
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			800 mA
V_{SD}	$I_F = I_S$, V_{GS} = 0V, Note 1			1.5 V
t_{rr}	I_F = 200mA, -di/dt = 50A/µs, V_R = 100V		1.6	µs

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

TO-268HV Outline

PINS:
1 - Gate 2 - Source
3 - Drain

RECOMMENDED MINIMUM FOOT PRINT

SYM	INCHES		MILLIMETER	
	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
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

PINS:
1 - Gate   2 - Source
3, 4 - Drain
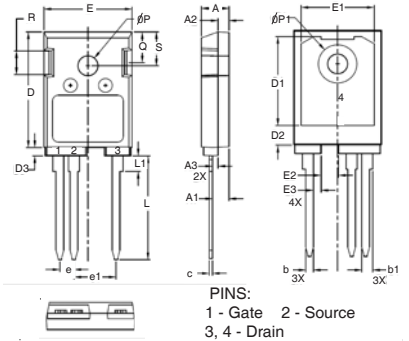
| SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.114	.122	2.90	3.10
A2	.075	.083	1.90	2.10
A3	.035	.043	0.90	1.10
b	.053	.059	1.35	1.50
b1	.075	.083	1.90	2.10
c	.022	.030	0.55	0.75
D	.819	.843	20.80	21.40
D1	.638	.646	16.20	16.40
D2	.134	.146	3.40	3.70
D3	.055	.063	1.40	1.60
E	.622	.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

Fig. 1. Output Characteristics @ T_J = 25⁰C
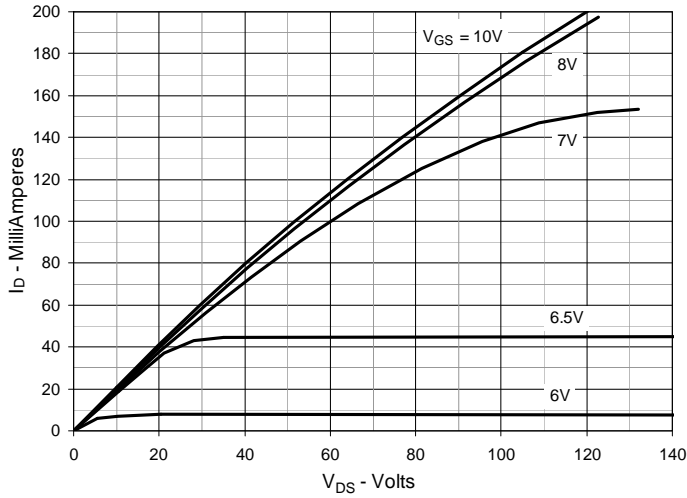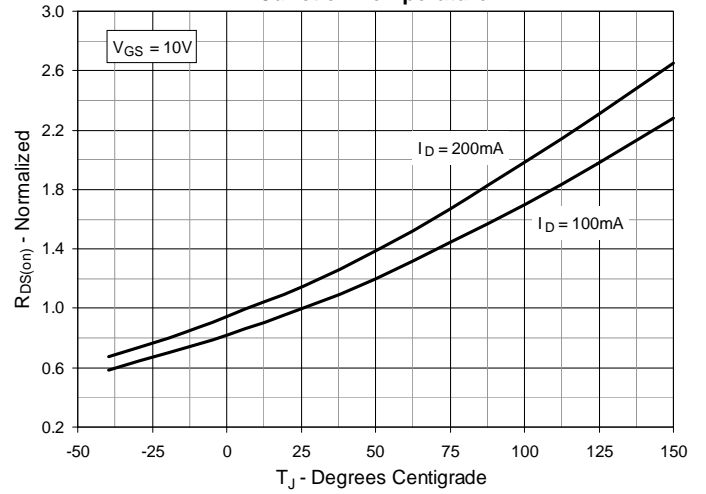
Fig. 2. Extended Output Characteristics @ T_J = 25⁰C
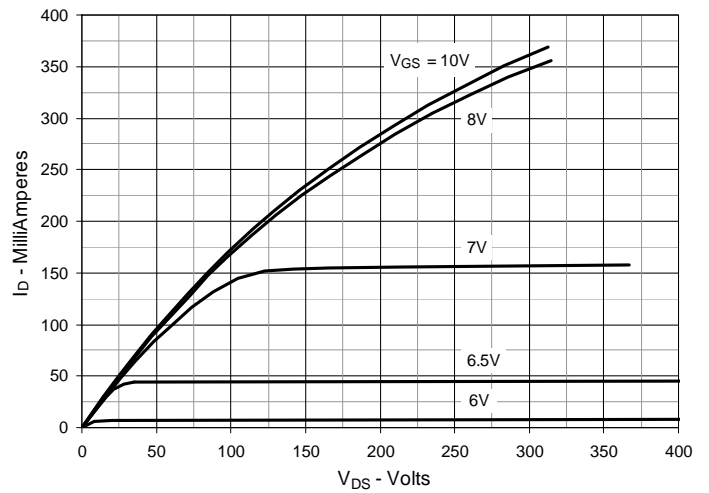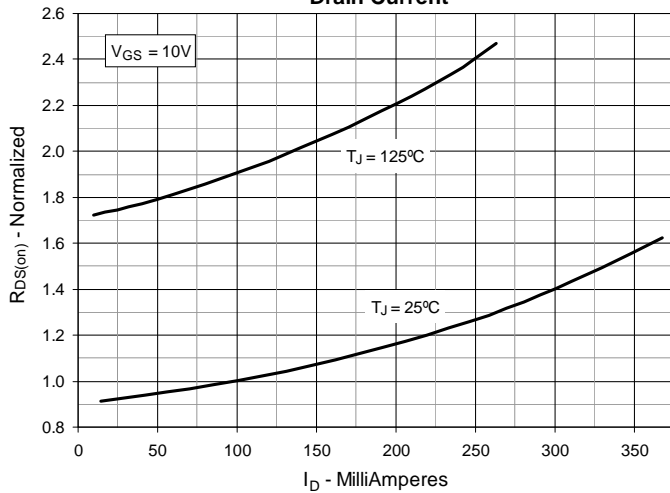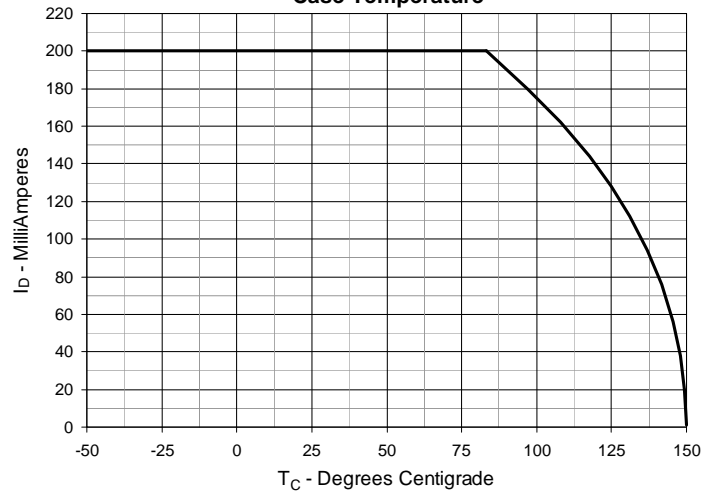
Fig. 3. Output Characteristics @ T_J = 125⁰C
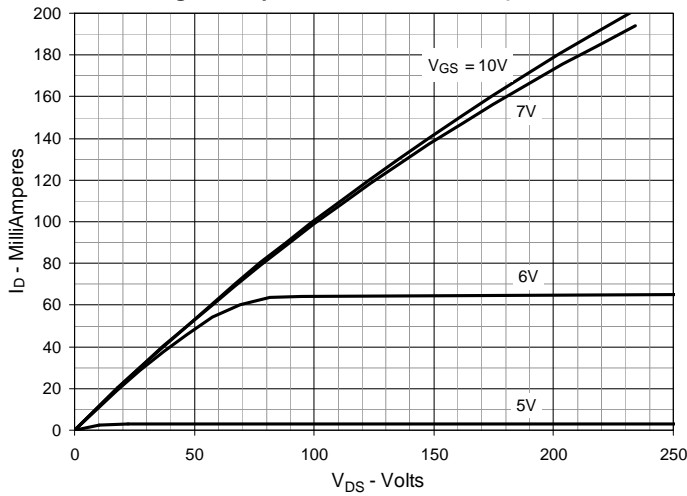
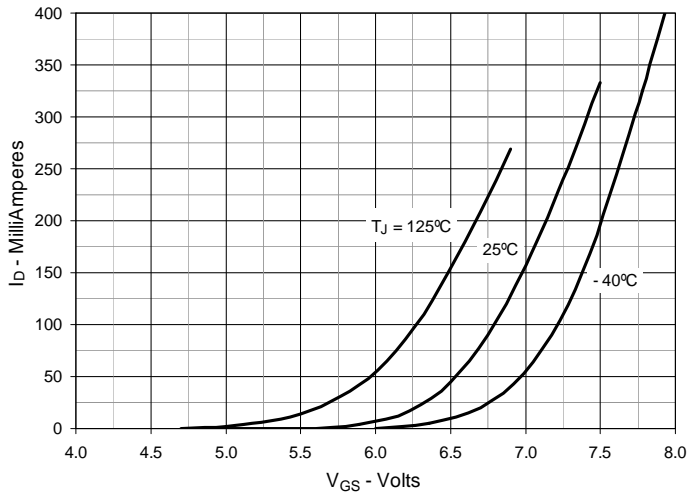**Fig. 4. R_DS(on) Normalized to I_D = 100mA Value vs. Junction Temperature**

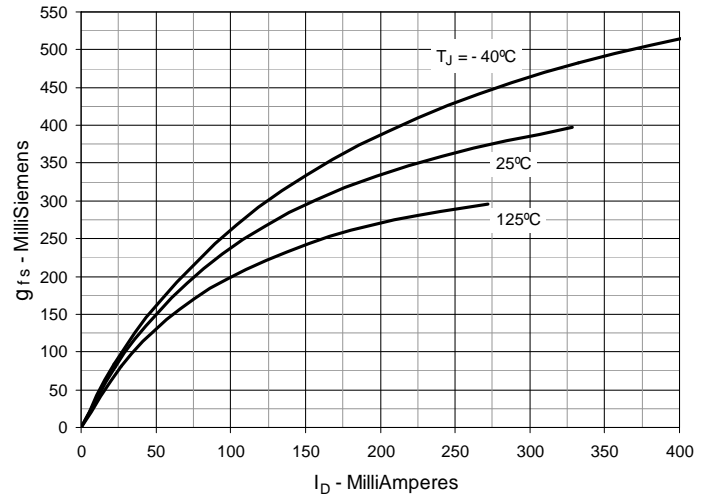**Fig. 5. R_DS(on) Normalized to I_D = 100mA Value vs. Drain Current**

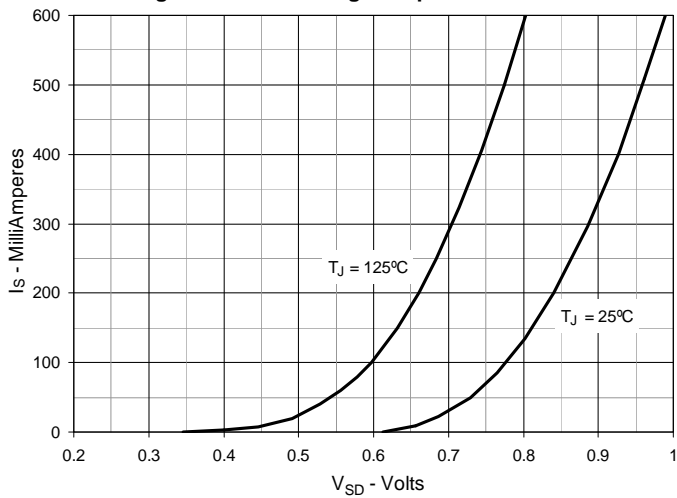**Fig. 6. Maximum Drain Current vs. Case Temperature**
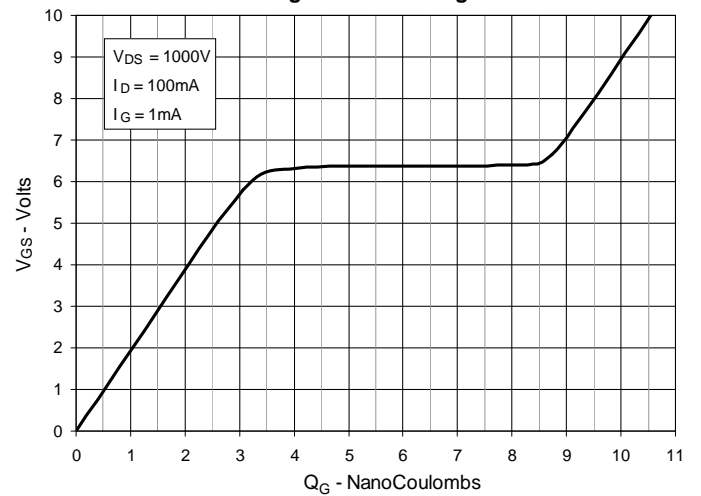
Fig. 7. Input Admittance
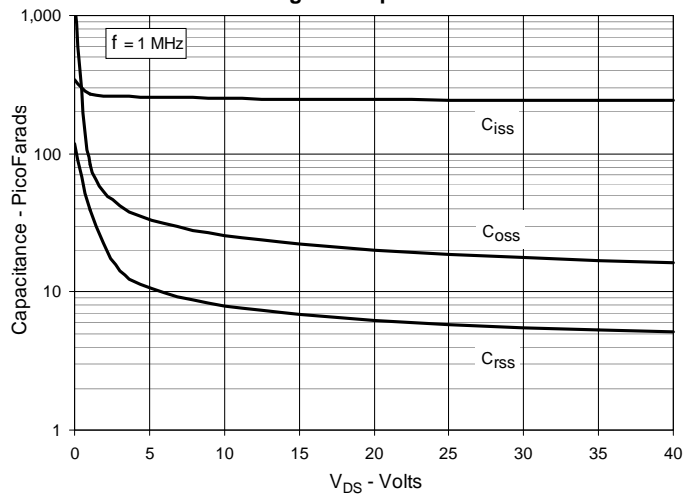

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Maximum Transient Thermal Impedance

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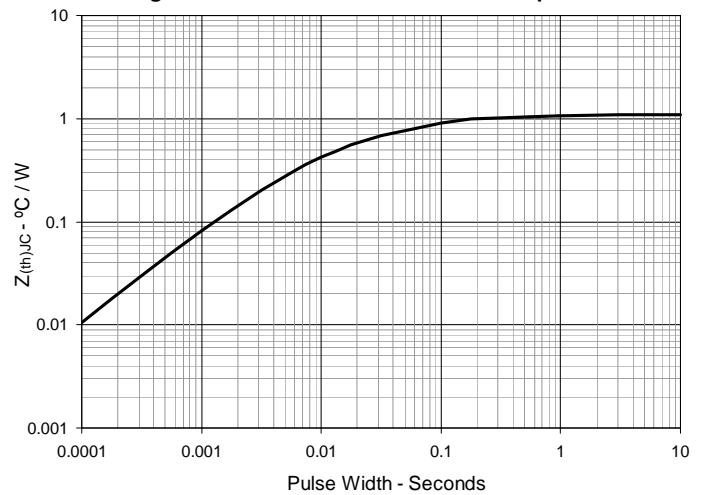
Fig. 13. Forward-Bias Safe Operating Area
@ T_C = 25ºC
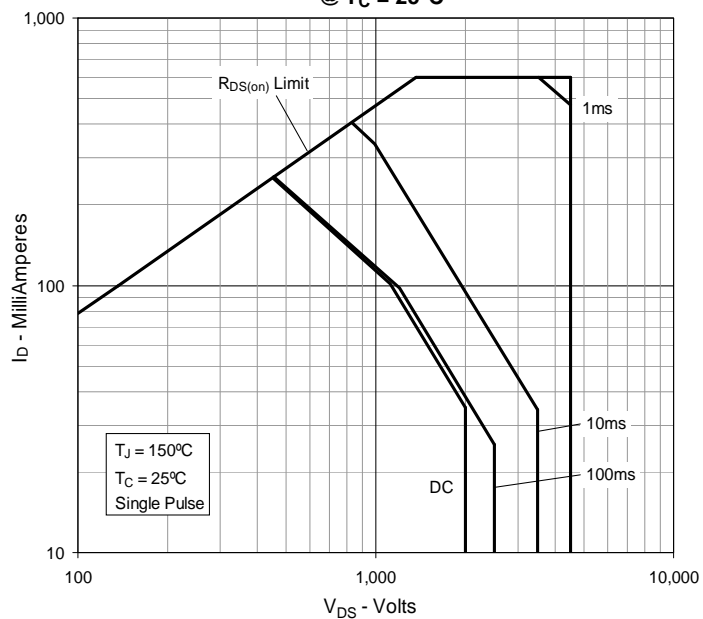
Fig. 14. Forward-Bias Safe Operating Area
@ T_C = 75ºC
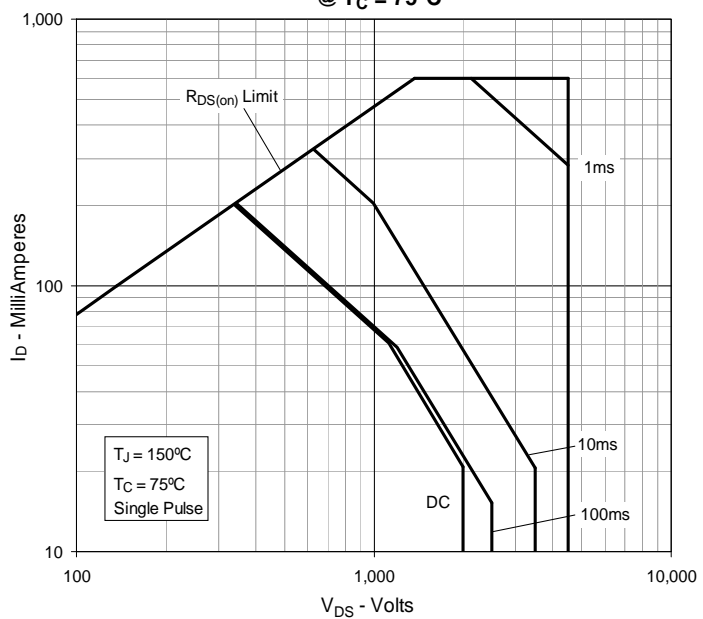
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