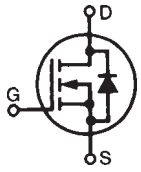
IXYS

High Voltage Power MOSFET

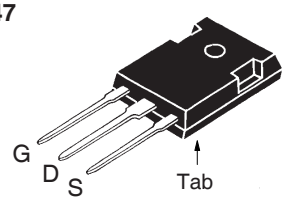
IXTH1N250

V_{DSS} = 2500V
I_{D25} = 1.5A
$R_{DS(on)}$ ≤ 40Ω

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



TO-247



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	2500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	2500	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	1.5	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	6	A
P_D	T_C = 25°C	250	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	1.6mm (0.062 in.) From Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque	1.13 / 10	Nm/lb.in.
Weight		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	2500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	2.0		4.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}, V_{GS} = 0V			25	μA
	T_J = 125°C		25		μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Note 1			40	Ω

Features

- International Standard Package
- Molding Epoxies Weet UL 94 V-0 Flammability Classification
- Fast Intrinsic Diode
- Low Package Inductance

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

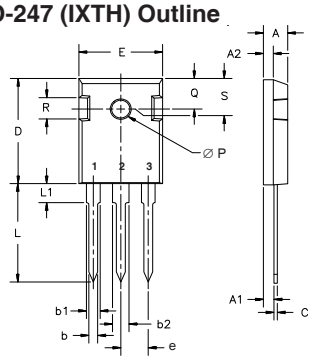
- High Voltage Power Supplies
- Capacitor Discharge
- Pulse Circuits

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 50V, I_D = 0.5A, Note 1	1.0	1.8		mS
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1660		pF
C_{oss}			77		pF
C_{rss}			23		pF
$t_{d(on)}$	**Resistive Switching Times**		69		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 1A		25		ns
$t_{d(off)}$	R_G = 5Ω (External)		132		ns
t_f			39		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 600V, I_D = 0.5A		41		nC
Q_{gs}			8		nC
Q_{gd}			16		nC
R_{thJC}				0.50	°C/W
R_{thCS}			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			1.5	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			6	A
V_{SD}	I_F = 1A, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 1A, -di/dt = 100A/μs, V_R = 200V		2.5		μs

TO-247 (IXTH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216

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

*Additional provisions for lead to lead voltage isolation are required at V_{DS} > 1200V.

Fig. 1. Output Characteristics @ T_J = @ 25ºC

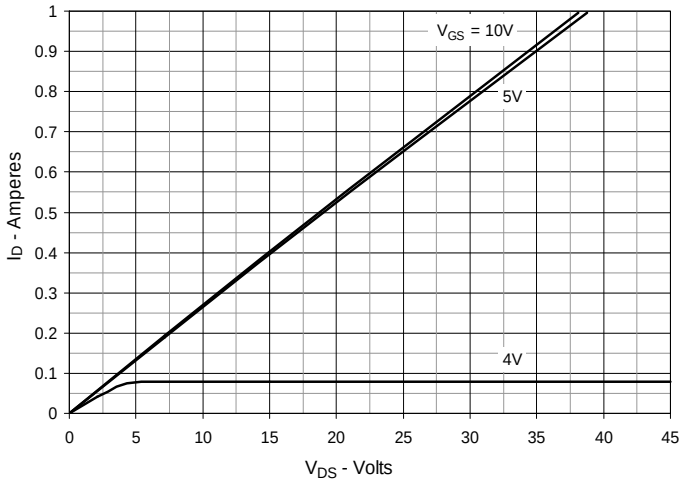


Fig. 2. Output Characteristics @ T_J = 125ºC

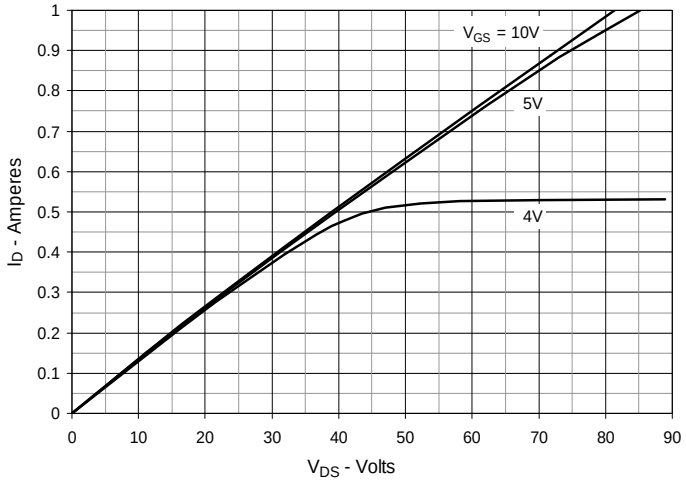


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 0.5A Value vs. Junction Temperature

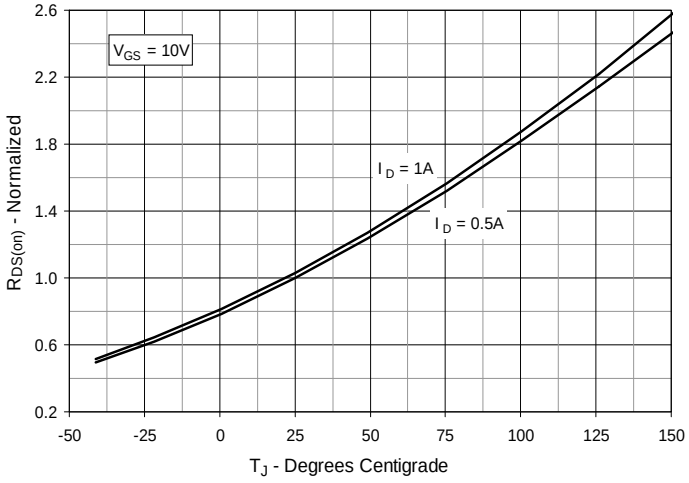


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 0.5A Value vs. Drain Current

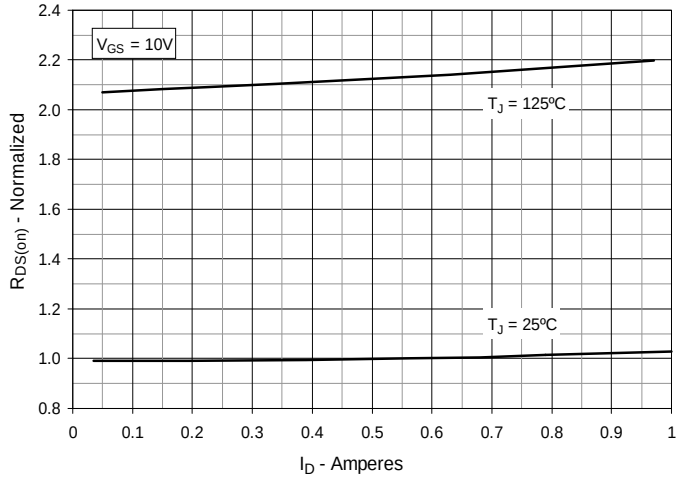


Fig. 5. Maximum Drain Current vs. Case Temperature

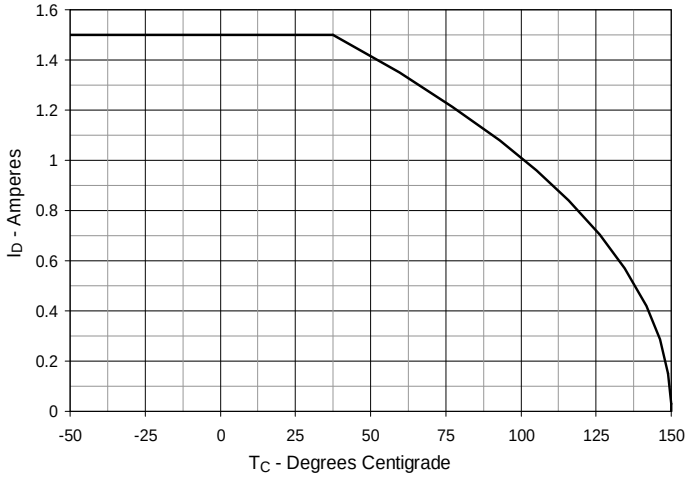


Fig. 6. Input Admittance

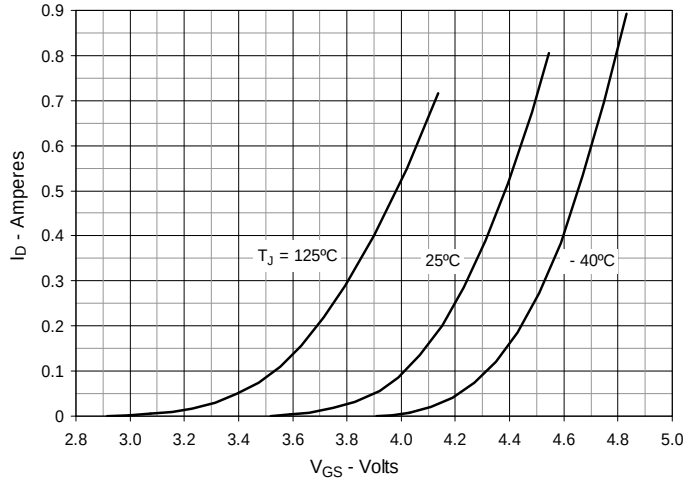


Fig. 7. Transconductance

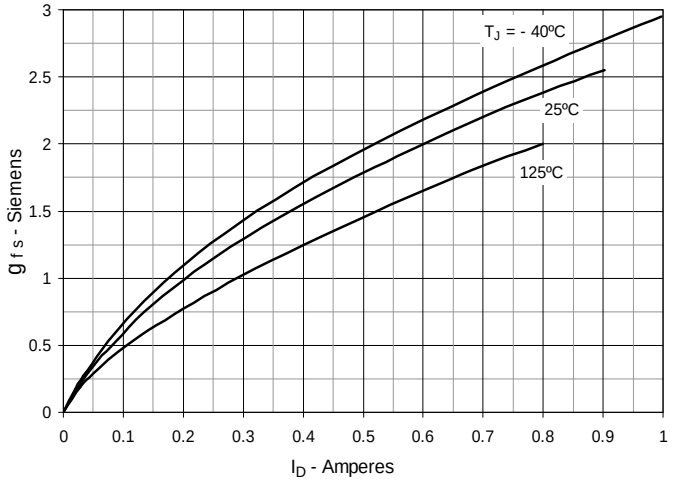


Fig. 8. Forward Voltage Drop of Intrinsic Diode

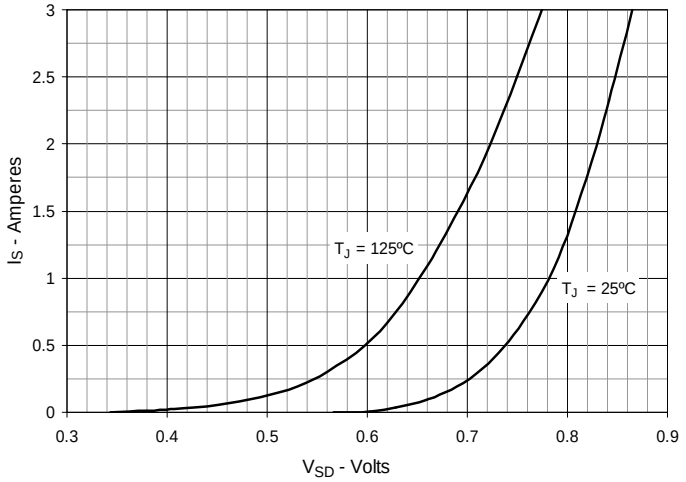


Fig. 9. Gate Charge

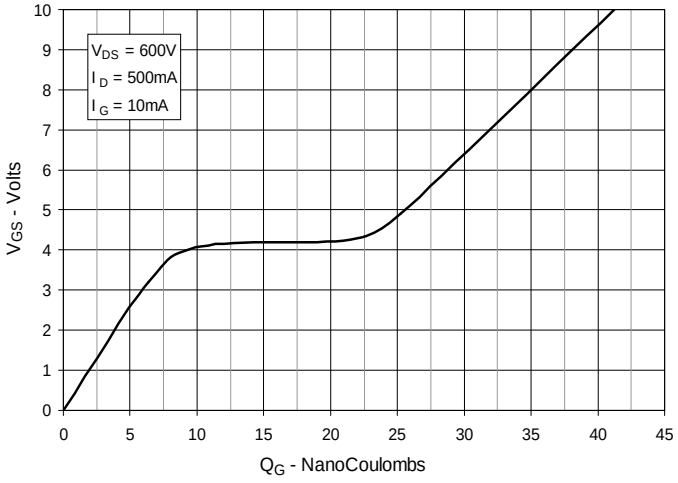


Fig. 10. Capacitance

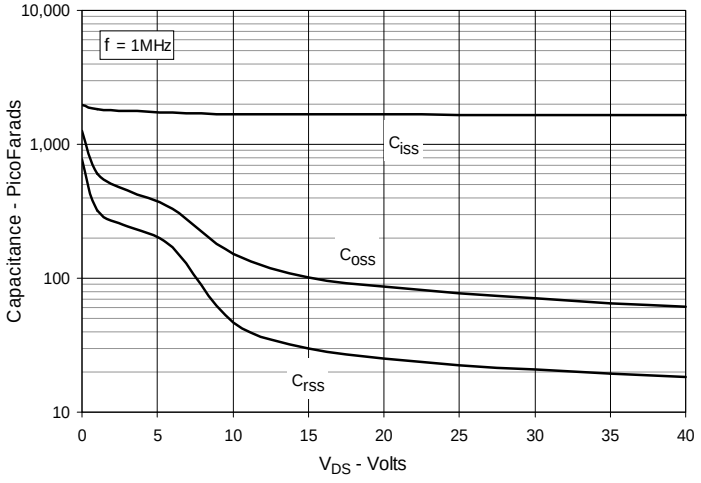


Fig. 11. Forward-Bias Safe Operating Area @ T_C = 25ºC

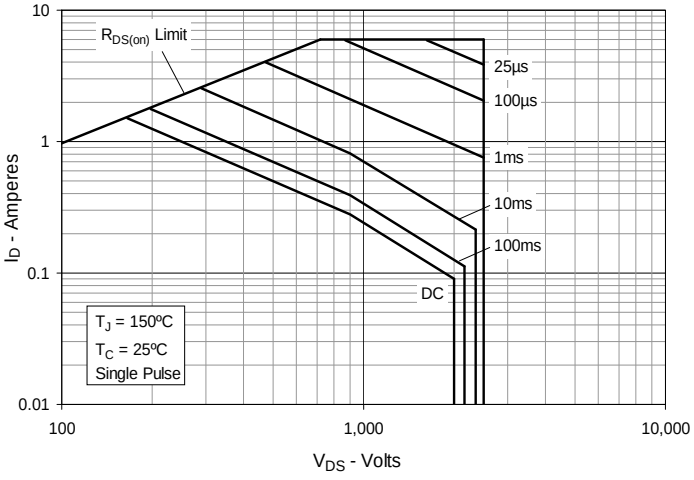


Fig. 12. Forward-Bias Safe Operating Area @ T_C = 75ºC

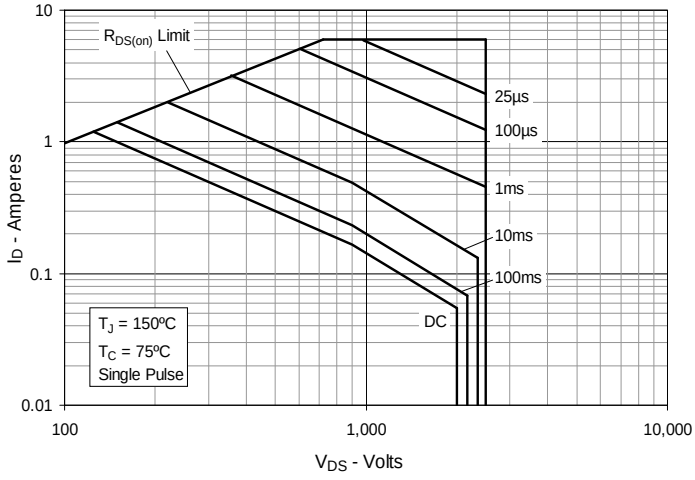


Fig. 13. Maximum Transient Thermal Impedance