THE DATASHEET OF

IXTX1R4N450HV

IXYS

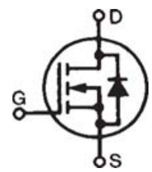
Advance Technical Information

High Voltage Power MOSFET

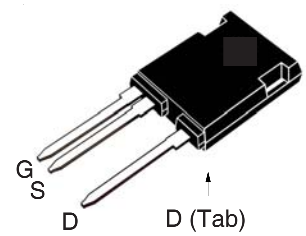
IXTX1R4N450HV

V_{DSS} = 4500V
I_{D25} = 1.4A
$R_{DS(on)}$ ≤ 40Ω

N-Channel Enhancement Mode



TO-247PLUS-HV



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	1.4	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	5.0	A
P_D	T_C = 25°C	960	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}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Force	20..120 / 4.5..27	Nm/lb.in
Weight		6	g

Features

- High Blocking Voltage
- High Voltage Package

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 (T_J = 25°C, Unless Otherwise Specified)		Characteristic Values Min.	Typ.	Max.	
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA		4.0		6.0	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				25	μA
	V_{DS} = 3.6kV	T_J = 125°C		50		μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50mA, Note 1				40	Ω

Symbol	Test Conditions (T$_J$ = 25°C, Unless Otherwise Specified)	Min.	Typ.	Max.	
g_{fs}	V_{DS} = 50V, I_D = 0.7A, Note 1	1.2	2.0		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3300		pF
C_{oss}			134		pF
C_{rss}			52		pF
R_{Gi}	Gate Input Resistance		7.8		Ω
$t_{d(on)}$	**Resistive Switching Times**		44		ns
t_r	V_{GS} = 10V, V_{DS} = 500V, I_D = 0.7A		60		ns
$t_{d(off)}$	R_G = 10Ω (External)		126		ns
t_f			170		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.7A		88		nC
Q_{gs}			16		nC
Q_{gd}			42		nC
R_{thJC}				0.13	°C/W
R_{thCS}			0.15		°C/W

Source-Drain Diode

Symbol	Test Conditions (T$_J$ = 25°C, Unless Otherwise Specified)	Min.	Typ.	Max	
I_S	V_{GS} = 0V, Note1			1.4	A
I_{SM}	Repetitive, pulse Width Limited by T_{JM}			5.6	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 1A, -di/dt = 100A/μs		660		ns
Q_{RM}	V_R = 100V		4.6		μC
I_{RM}			14.0		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.

Fig. 1. Output Characteristics @ T_J = 25ºC

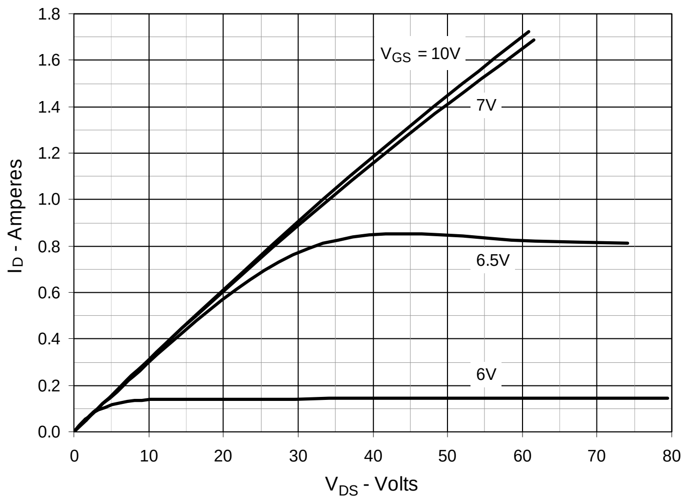


Fig. 2. Output Characteristics @ T_J = 125ºC

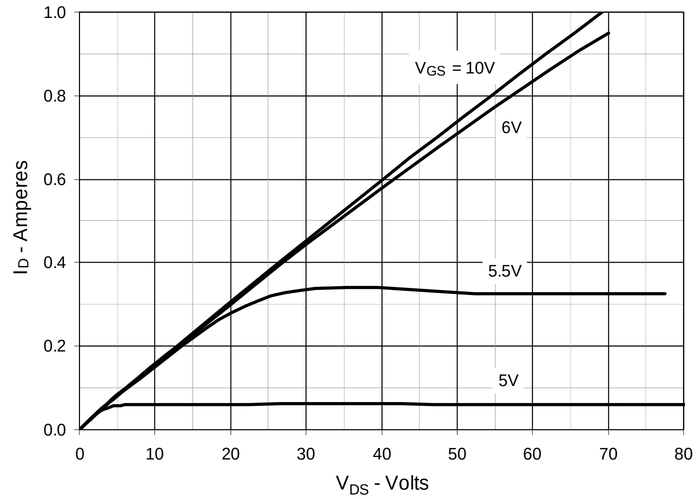


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 0.7A Value vs. Junction Temperature

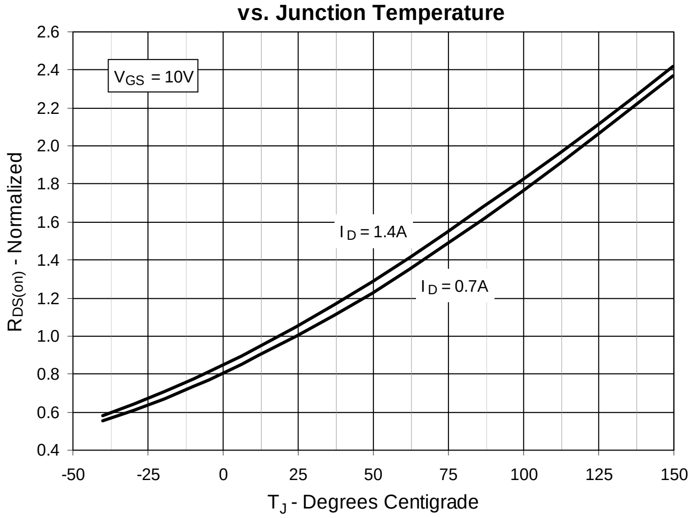


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 0.7A Value vs. Drain Current

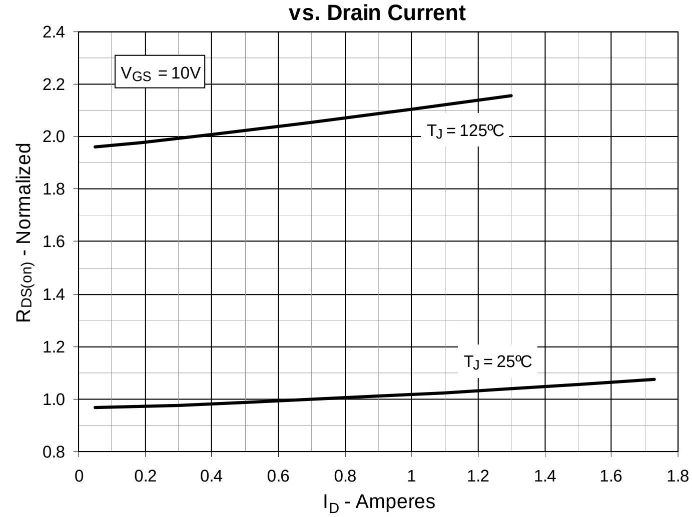


Fig. 5. Maximum Drain Current vs. Case Temperature

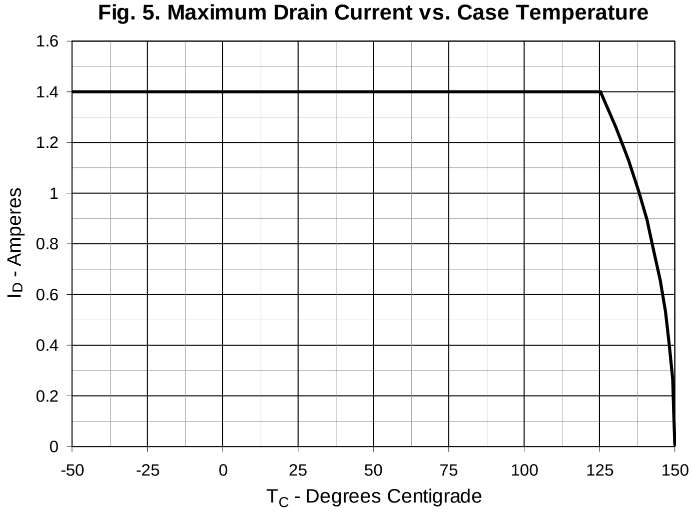


Fig. 6. Input Admittance

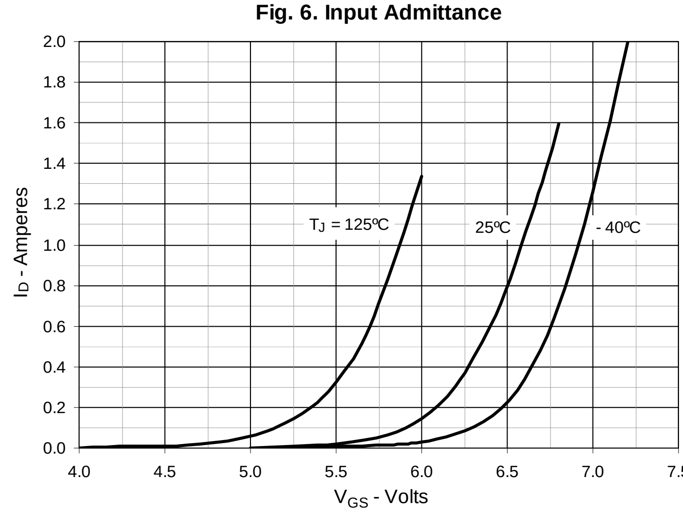


Fig. 7. Transconductance

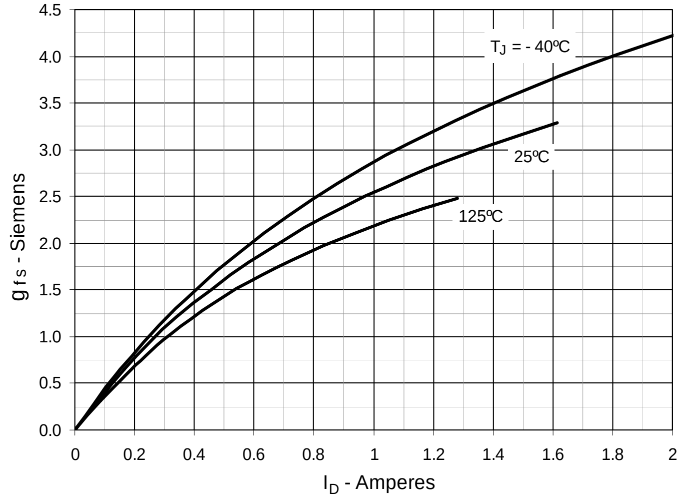


Fig. 8. Forward Voltage Drop of Intrinsic Diode

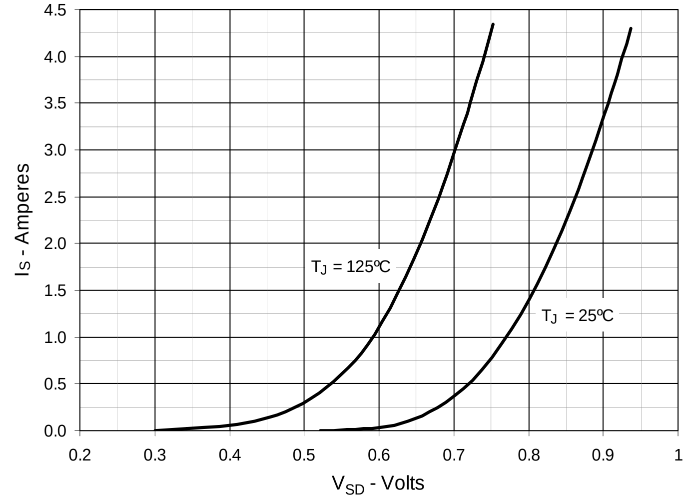


Fig. 9. Gate Charge

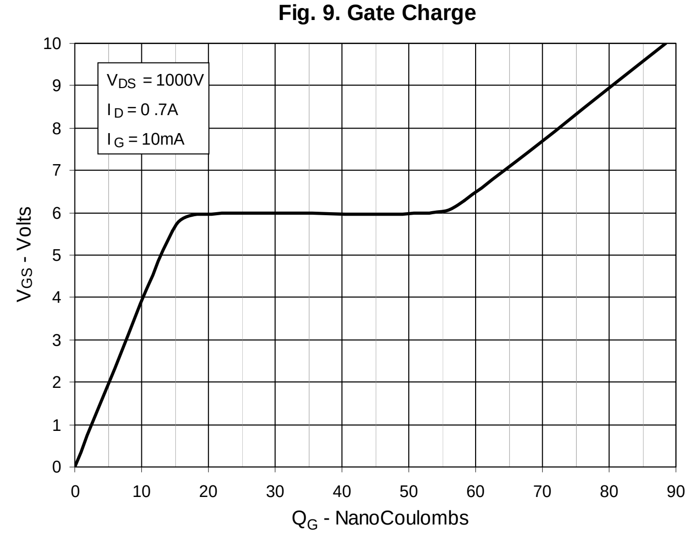


Fig. 10. Capacitance

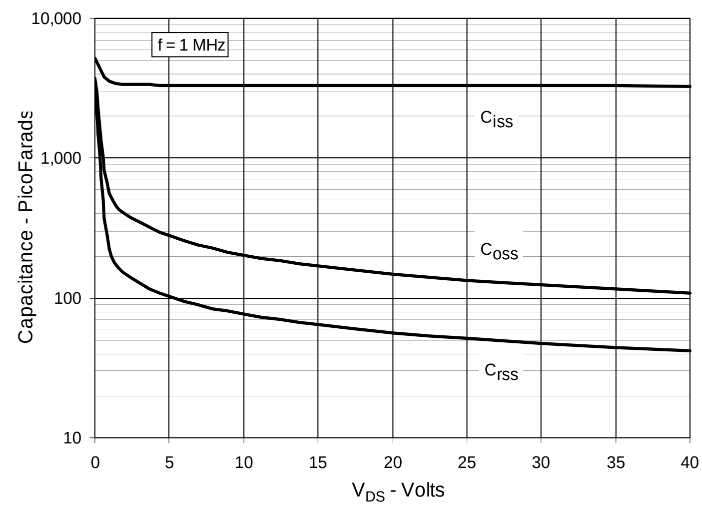


Fig. 11. Forward-Bias Safe Operating Area

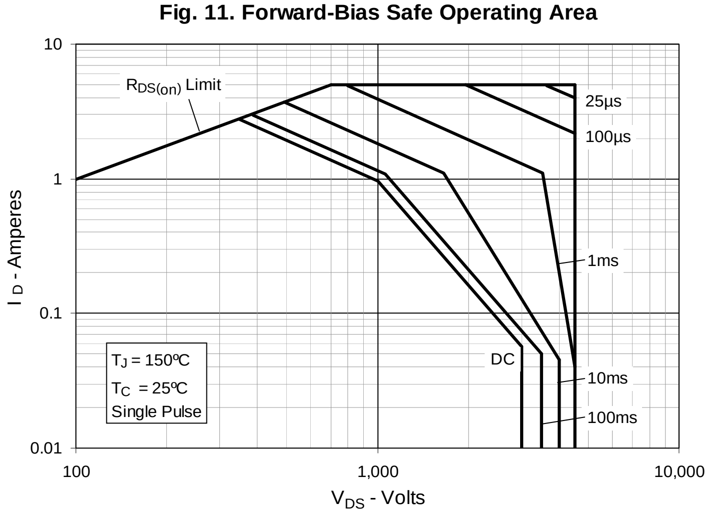
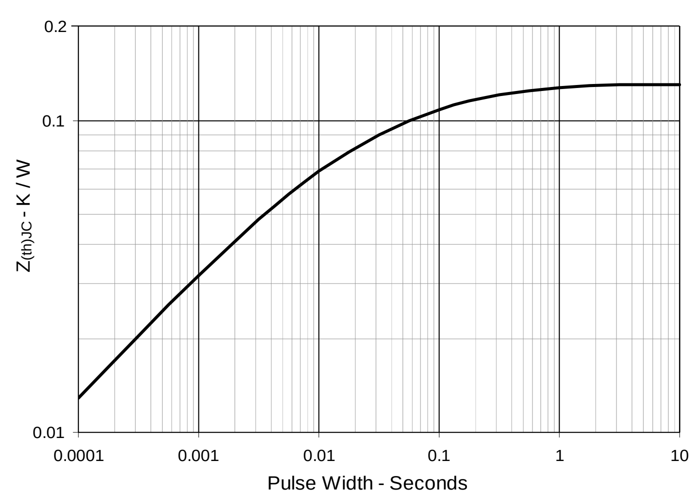
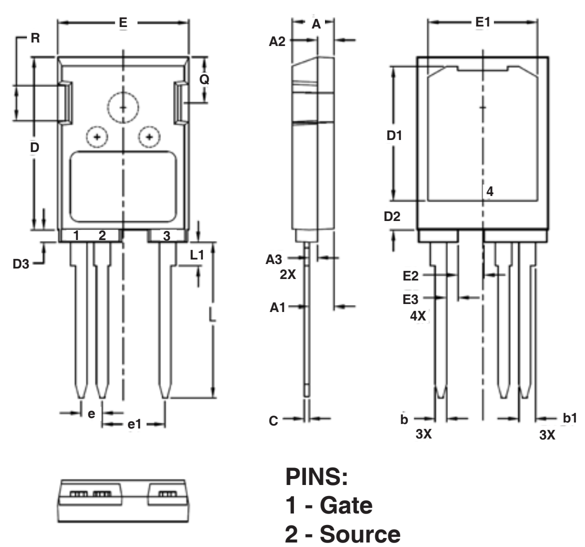


Fig. 12. Maximum Transient Thermal Impedance



TO-247PLUS HV 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
Q	.216	.224	5.50	5.70
R	.165	.169	4.20	4.30

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