IXYS

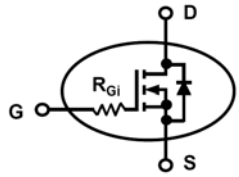
Advance Technical Information

High Voltage Power MOSFET

IXTL2N470

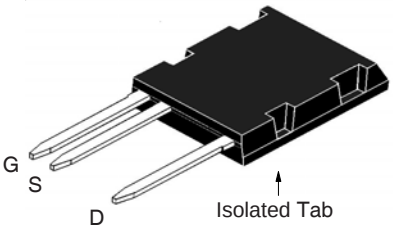
V_{DSS} = 4700V
I_{D25} = 2A
$R_{DS(on)}$ ≤ 20Ω

(Electrically Isolated Tab)



N-Channel Enhancement Mode

ISOPLUS i5-Pak™



G = Gate S = Source
D = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	4700	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	4700	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	2	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	8	A
P_D	T_C = 25°C	220	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
F_C	Mounting Force	20..120 / 4.5..27	N/lb.
V_{ISOL}	50/60Hz, 1 Minute	4000	V~
Weight		8	g

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	3.5		6.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = 3.6kV, V_{GS} = 0V			10	μA
	V_{DS} = 4.7kV			50	μA
	V_{DS} = 3.6kV Note 2, T_J = 125°C		250		μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Note 1			20	Ω

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V~ RMS Electrical Isolation
- Molding Epoxies meet UL 94 V-0 Flammability Classification

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.	
g_{fs}	V_{DS} = 60V, I_D = 0.5 • I_{D25}, Note 1	2.1	3.5		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		6860		pF
C_{oss}			267		pF
C_{rss}			105		pF
R_{Gi}	Integrated Gate Input Resistance		4.0		Ω
$t_{d(on)}$	**Resistive Switching Times**		40		ns
t_r	V_{GS} = 10V, V_{DS} = 1kV, I_D = 1A		34		ns
$t_{d(off)}$	R_G = 0Ω (External)		123		ns
t_f			205		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 1kV, I_D = 0.5 • I_{D25}		180		nC
Q_{gs}			34		nC
Q_{gd}			83		nC
R_{thJC}				0.56	°C/W
R_{thCS}			0.15		°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			2	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			8	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			3	V
t_{rr}	I_F = 2A, -di/dt = 100A/μs, V_R = 100V		1.75		μs

Notes: 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
2. Part must be heatsunk for high-temp Idss measurement.

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

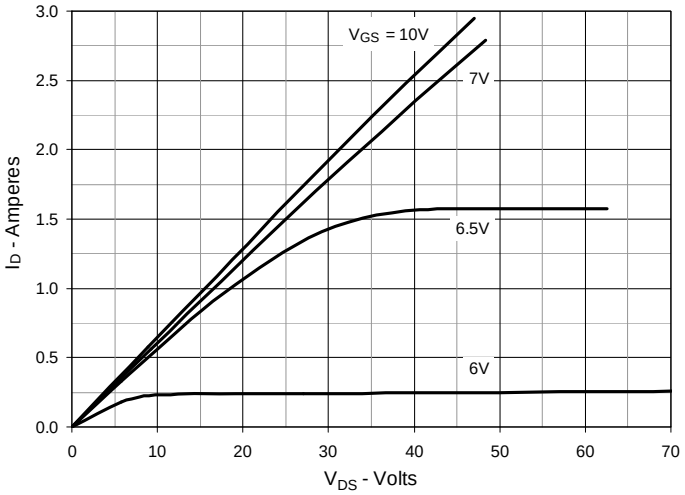


Fig. 2. Output Characteristics @ T_J = 125ºC

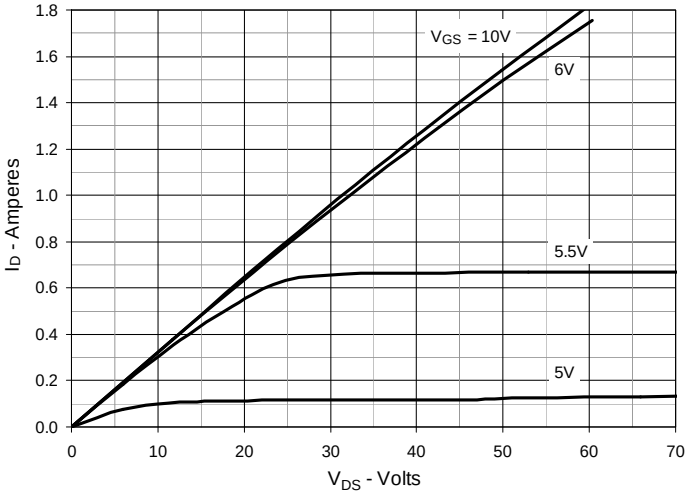


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 1A Value vs. Junction Temperature

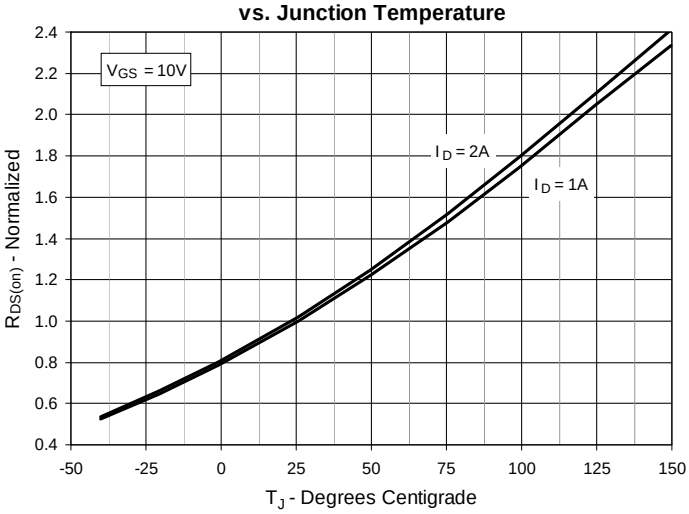


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 1A Value vs. Drain Current

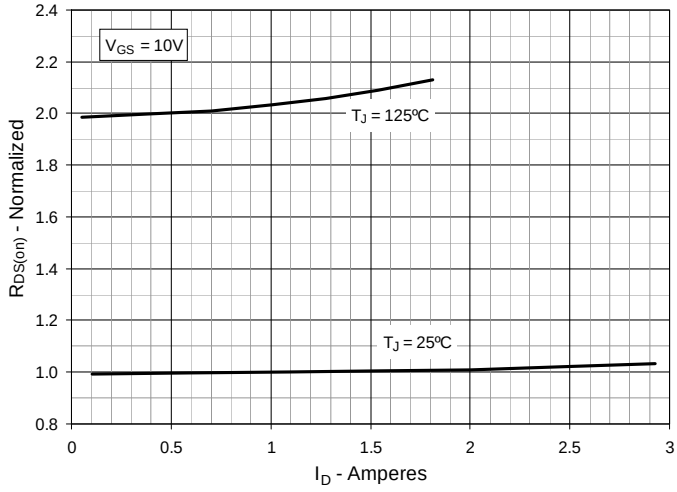


Fig. 5. Maximum Drain Current vs. Case Temperature

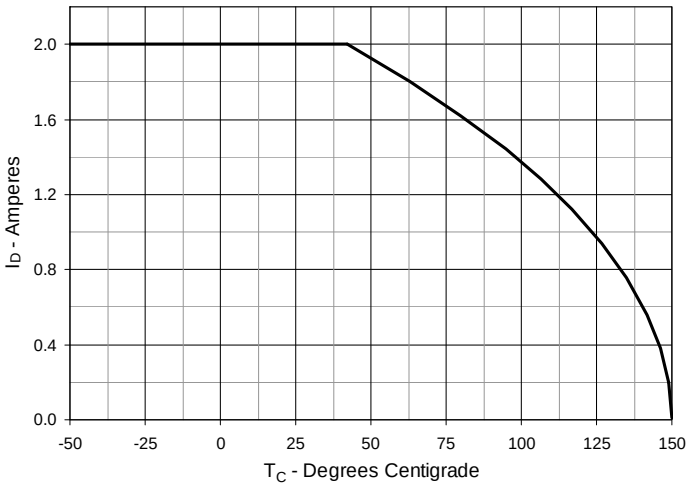


Fig. 6. Input Admittance

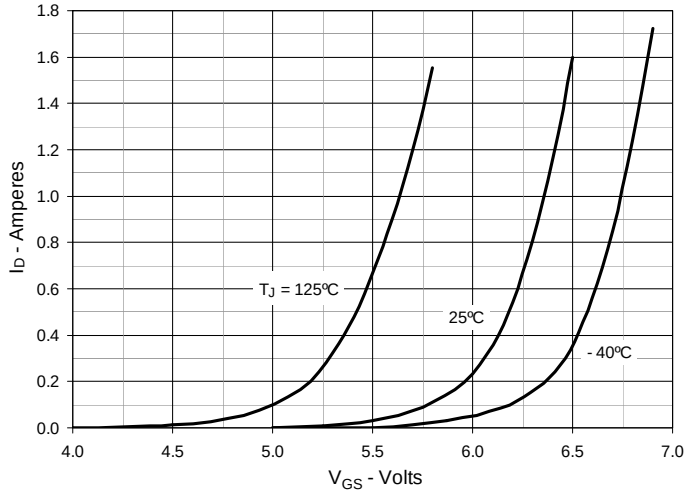


Fig. 7. Transconductance

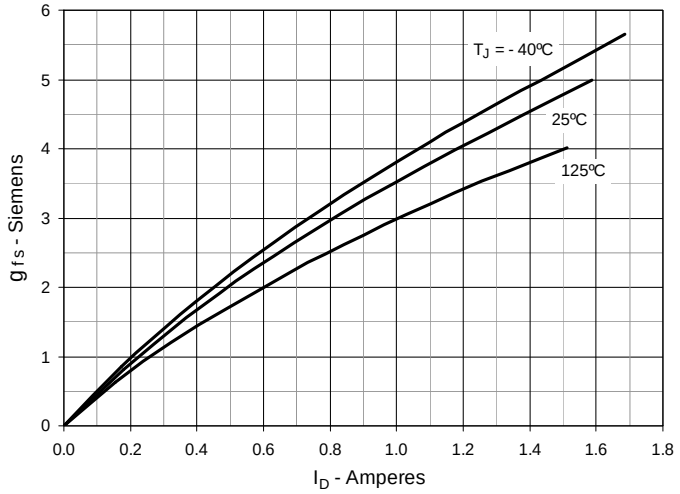


Fig. 8. Forward Voltage Drop of Intrinsic Diode

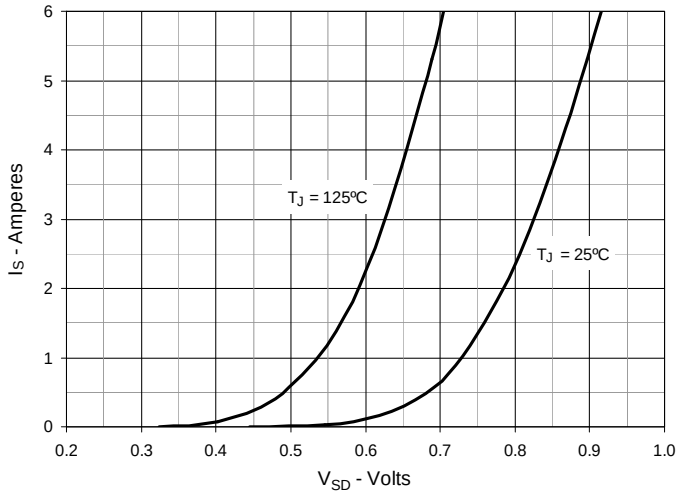


Fig. 9. Gate Charge

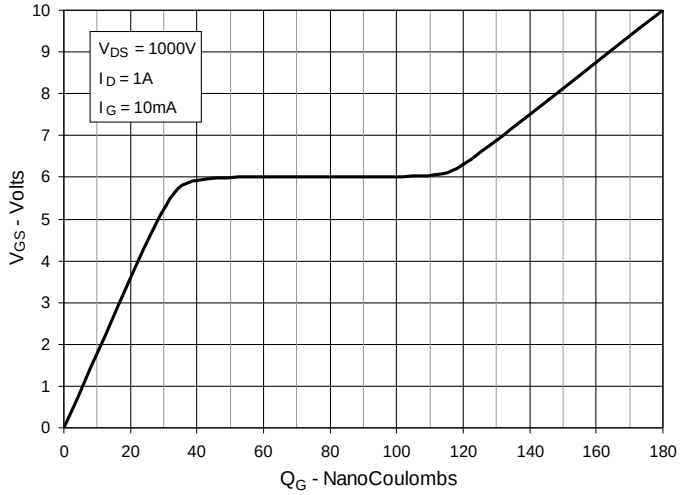


Fig. 10. Capacitance

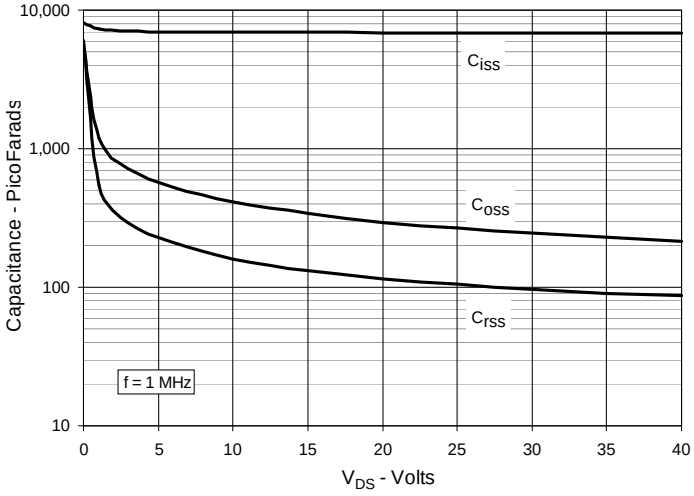


Fig. 11. Forward-Bias Safe Operating Area

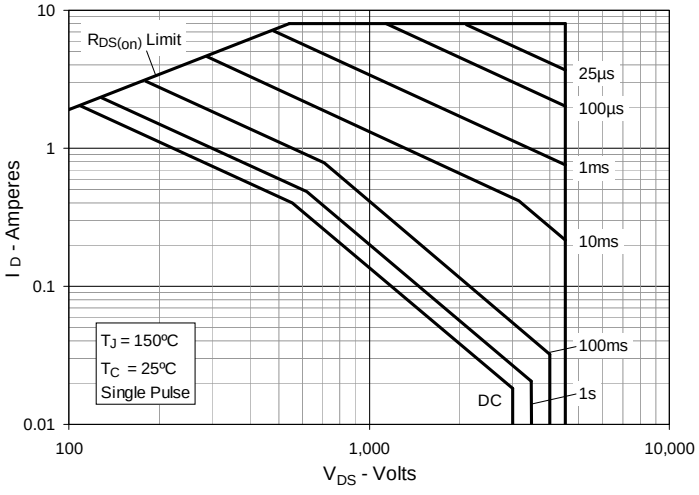


Fig. 12. Resistive Switching Times vs. External Gate Resistance

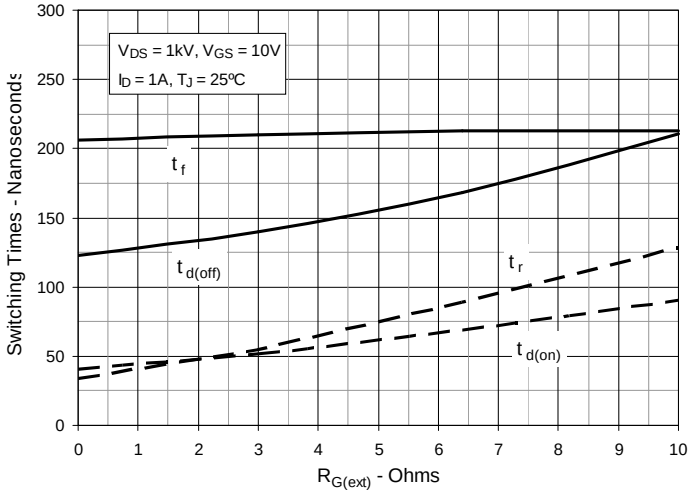
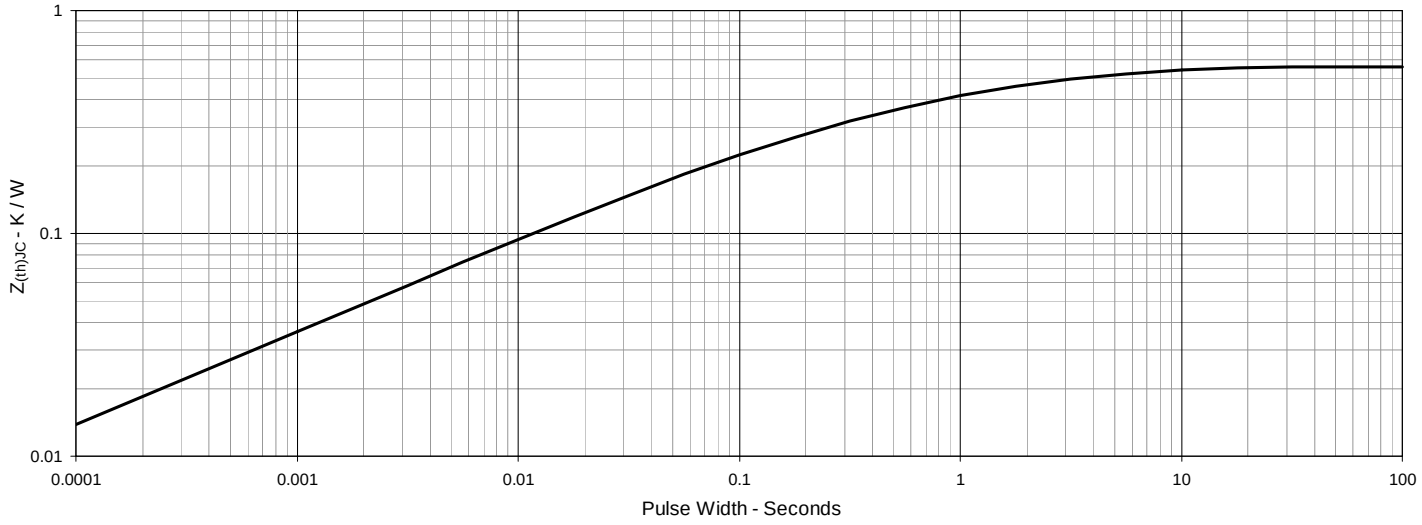
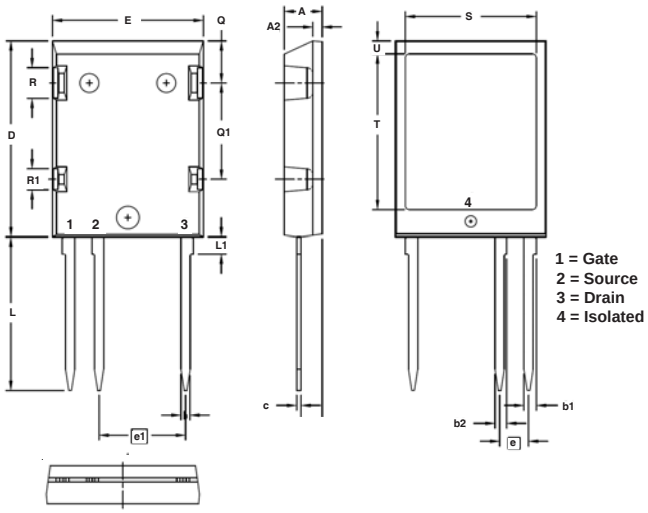


Fig. 13. Maximum Transient Thermal Impedance



ISOPLUS i5-Pak™ (IXTL) Outline



1 = Gate
2 = Source
3 = Drain
4 = Isolated

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.055	1.17	1.40
b	.045	.055	1.14	1.40
b1	.063	.072	1.60	1.83
b2	.058	.068	1.47	1.73
c	.020	.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
e1	.450 BSC		11.43 BSC	
L	.780	.820	19.81	20.83
L1	.080	.102	2.03	2.59
Q	.210	.235	5.33	5.97
Q1	.490	.513	12.45	13.03
R	.150	.180	3.81	4.57
R1	.100	.130	2.54	3.30
S	.668	.690	16.97	17.53
T	.801	.821	20.34	20.85
U	.065	.080	1.65	2.03