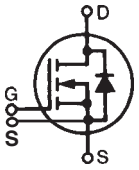
IXYS

Advance Technical Information

LinearL2™ Power MOSFET w/ Extended FBSOA

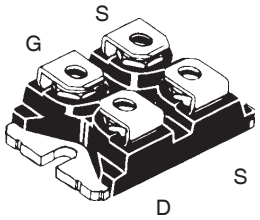
IXTN240N075L2

V_{DSS} = 75V
I_{D25} = 225A
$R_{DS(on)}$ ≤ 7mΩ



N-Channel Enhancement Mode
Avalanche Rated

miniBLOC, SOT-227
E153432



G = Gate D = Drain
S = Source

Either Source Terminal S can be used as the Source Terminal or the Kelvin Source (Gate Return) Terminal.

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		75	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		75	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C (Chip Capability)		225	A
$I_{L(RMS)}$	External Lead Current Limit		200	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}		720	A
I_A	T_C = 25°C		240	A
E_{AS}	T_C = 25°C		3	J
P_D	T_C = 25°C		735	W
T_J			-55...+150	°C
T_{JM}			150	°C
T_{stg}			-55...+150	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 minute	2500	V~
	I_{ISOL} ≤ 1mA	t = 1 second	3000	V~
M_d	Mounting Torque		1.5/13	Nm/lb.in
	Terminal Connection Torque		1.3/11.5	Nm/lb.in
Weight			30	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	75			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 3mA	2.0		4.5	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			10	μA
	T_J = 125°C			50	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 120A, Note 1			7	mΩ

Features

- Designed for Linear Operation
- International Standard Package
- Guaranteed FBSOA at 75°C
- Avalanche Rated
- Molding Epoxy Meets UL94 V-0 Flammability Classification
- MiniBLOC with Aluminium Nitride Isolation

Advantages

- Easy to mount
- Space savings
- High power density

Applications

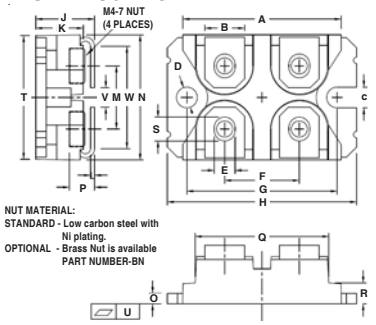
- Solid state circuit breakers
- Soft start controls
- Linear amplifiers
- Programmable loads
- Current regulators

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Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	60	86	110	S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		19		nF
C_{oss}			4420		pF
C_{rss}			1470		pF
$t_{d(on)}$	**Resistive Switching Times**		34		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 120A		200		ns
$t_{d(off)}$	R_G = 1Ω (External)		136		ns
t_f			47		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 120A		546		nC
Q_{gs}			86		nC
Q_{gd}			225		nC
R_{thJC}				0.17	°C/W
R_{thCS}			0.05		°C/W

TO-227 Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.489	1.505	37.80	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	−.002	.004	−0.05	0.1
V	.130	.180	3.30	4.57
W	.780	.830	19.81	21.08

Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	
SOA	V_{DS} = 75V, I_D = 5.9A, T_C = 75°C, Tp = 5s	440			W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			240	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			960	A
V_{SD}	I_F = 100A, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 120A, -di/dt = 100A/µs,		206		ns
I_{RM}	V_R = 37.5V, V_{GS} = 0V		18.8		A
Q_{RM}			1.9		µC

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.

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of 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

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Fig. 1. Output Characteristics @ T_J = 25ºC

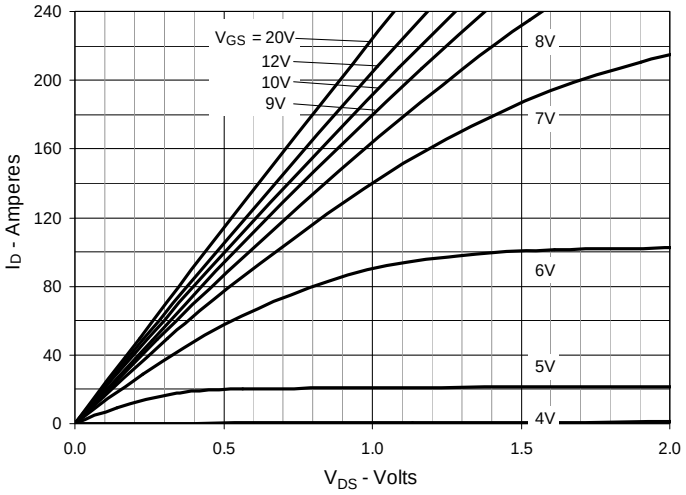


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

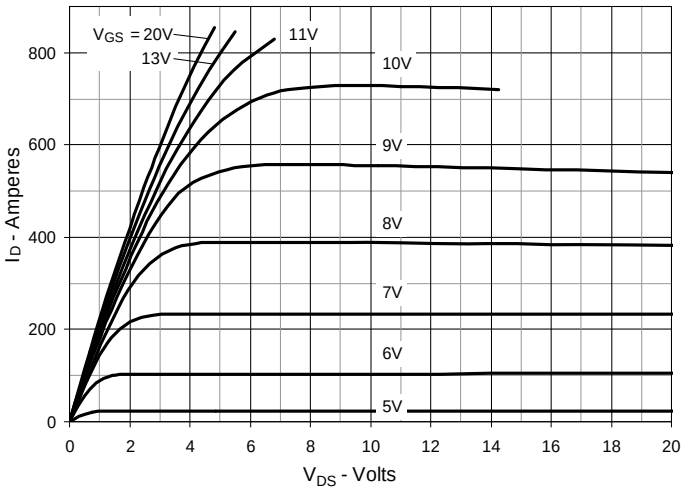


Fig. 3. Output Characteristics @ T_J = 125ºC

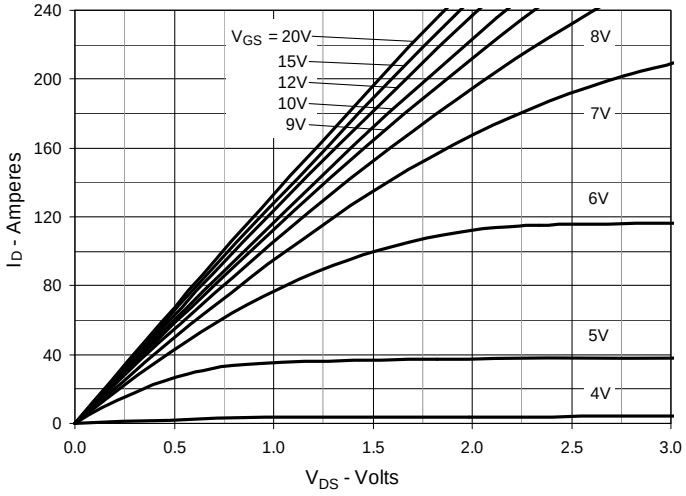


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 120A Value vs. Junction Temperature

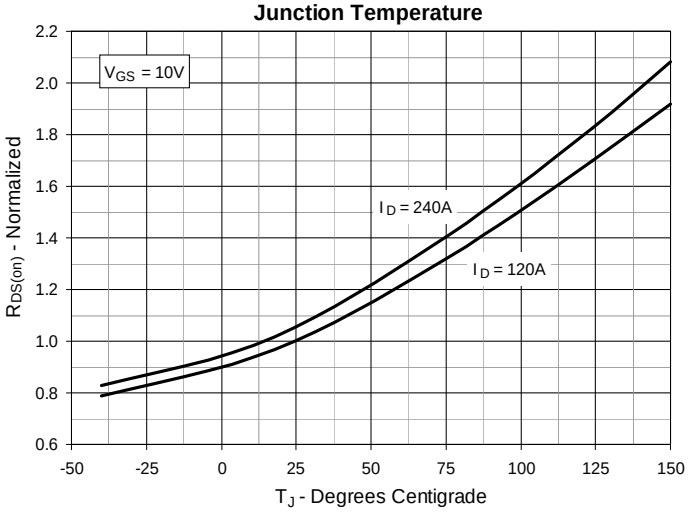


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 120A Value vs. Drain Current

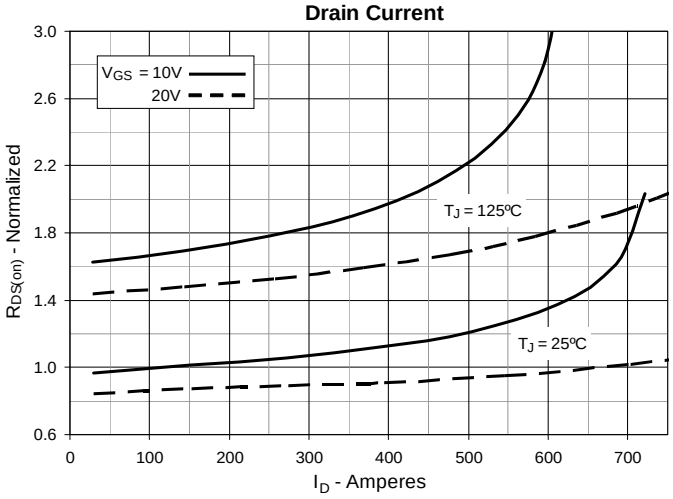
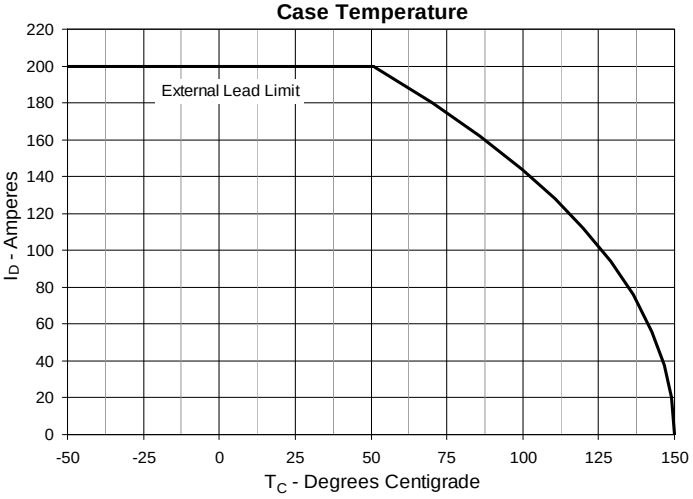


Fig. 6. Maximum Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

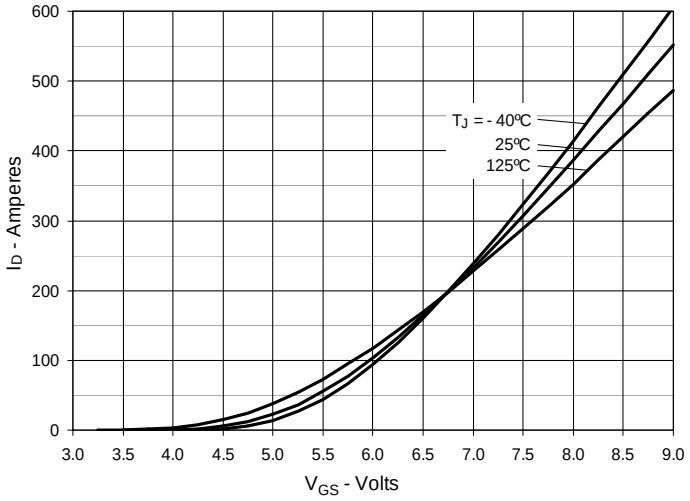


Fig. 8. Transconductance

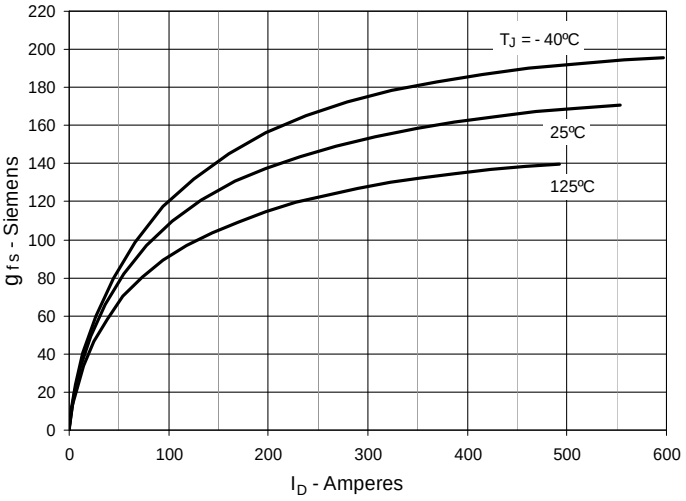


Fig. 9. Forward Voltage Drop of Intrinsic Diode

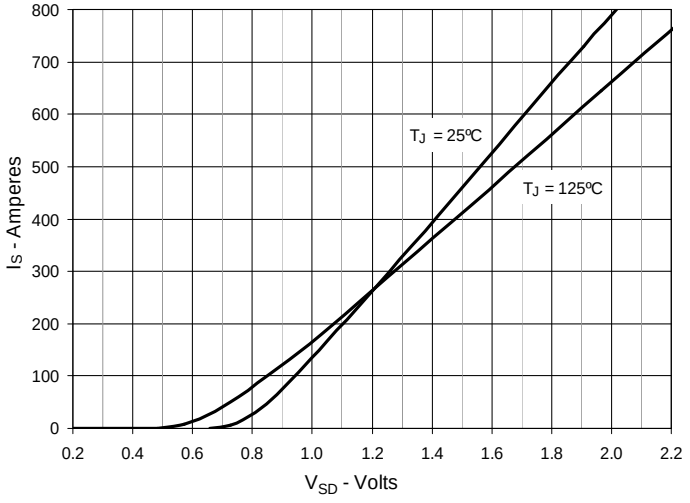


Fig. 10. Gate Charge

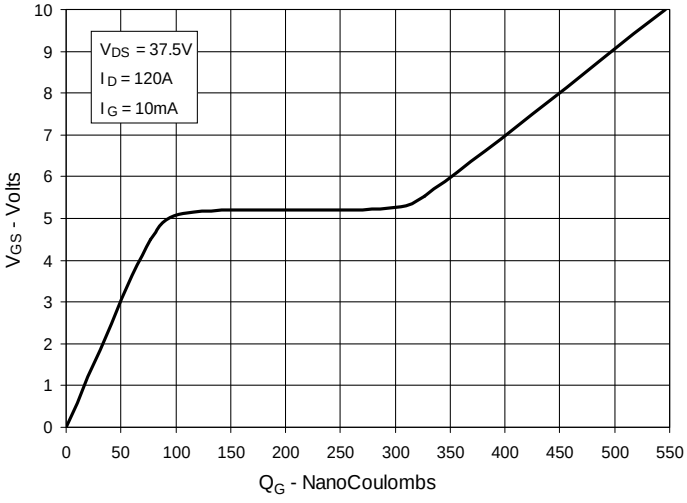


Fig. 11. Capacitance

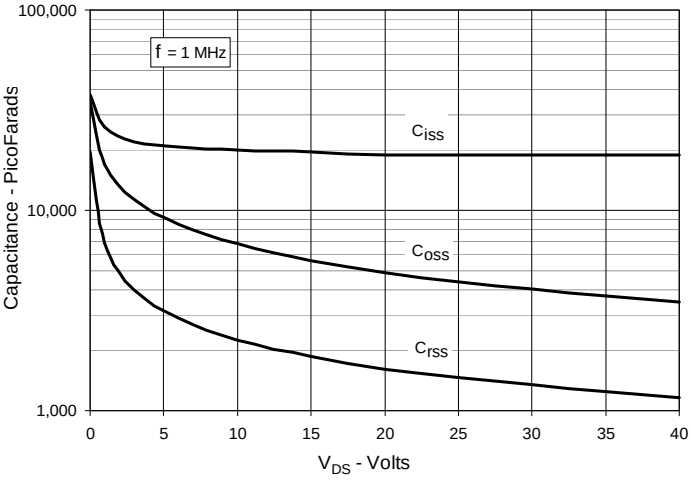
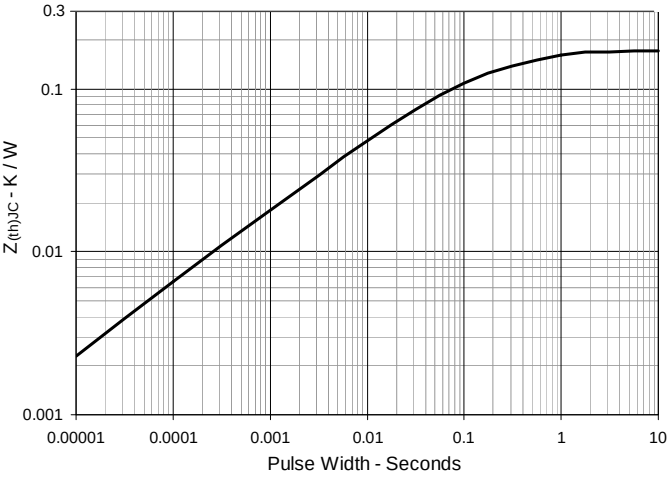


Fig. 12. Maximum Transient Thermal Impedance



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

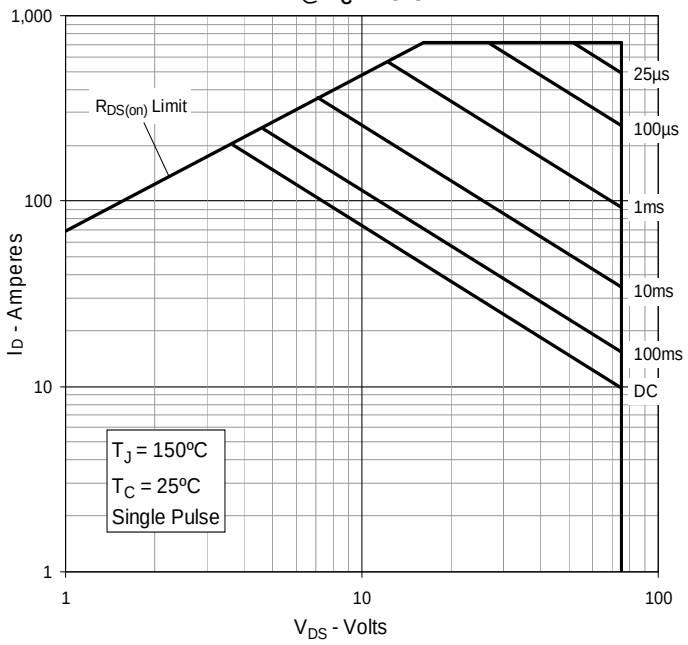
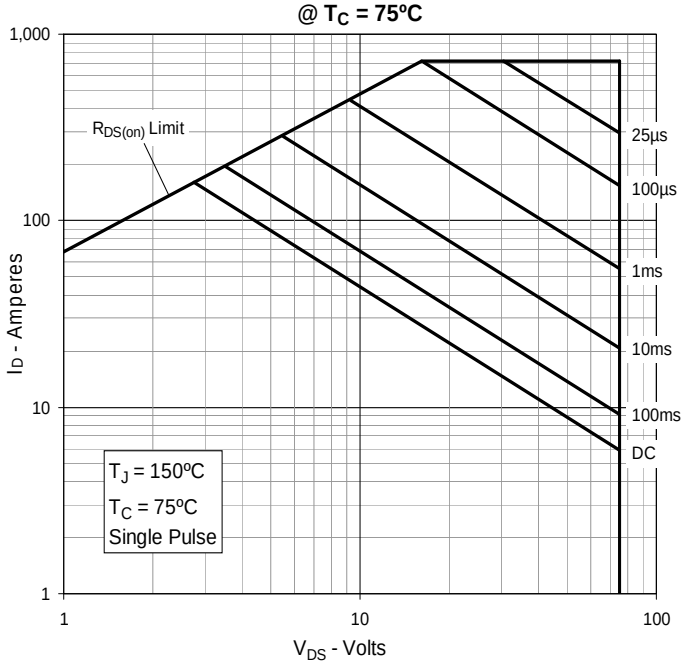


Fig. 14. Forward-Bias Safe Operating Area @ T_C = 75ºC



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