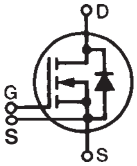
IXYS

Advance Technical Information

LinearL2™ Power MOSFET w/ Extended FBSOA

IXTN240N075L2

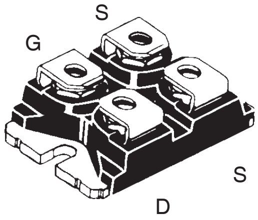
V_{DSS} = 75V
I_{D25} = 225A
$R_{DS(on)}$ ≤ 7mΩ



N-Channel Enhancement Mode
Avalanche Rated

miniBLOC, SOT-227
E153432

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



G = Gate D = Drain
S = Source

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

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

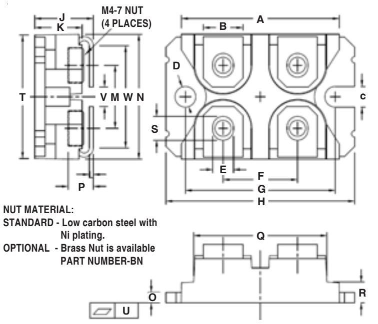
Applications

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

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

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** $V_{GS} = 10V$, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 120A$ $R_G = 1\Omega$ (External)		34		ns
t_r			200		ns
$t_{d(off)}$			136		ns
t_f			47		ns
$Q_{g(on)}$	$V_{GS} = 10V$, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 120A$		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



NUT MATERIAL:
STANDARD - Low carbon steel with Ni plating.
OPTIONAL - Brass Nut is available PART NUMBER-BN

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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}	$I_F = 120A$, $-di/dt = 100A/\mu s$, $V_R = 37.5V$, $V_{GS} = 0V$		206		ns
I_{RM}			18.8		A
Q_{RM}			1.9		μC

Note: 1. Pulse test, $t \leq 300\mu s$; duty cycle, $d \leq 2\%$.

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

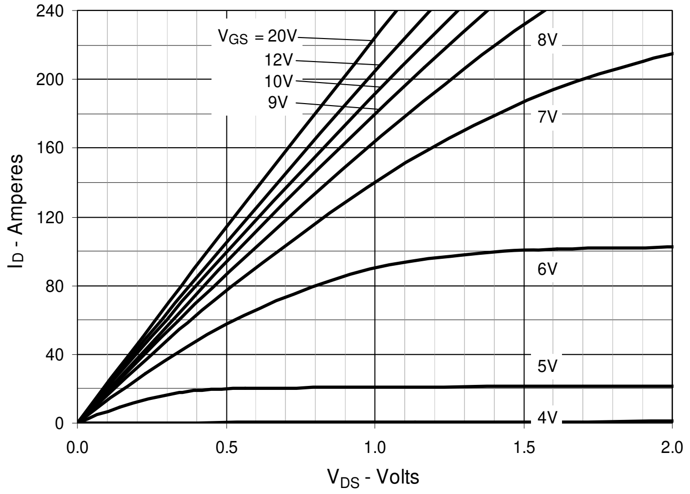


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

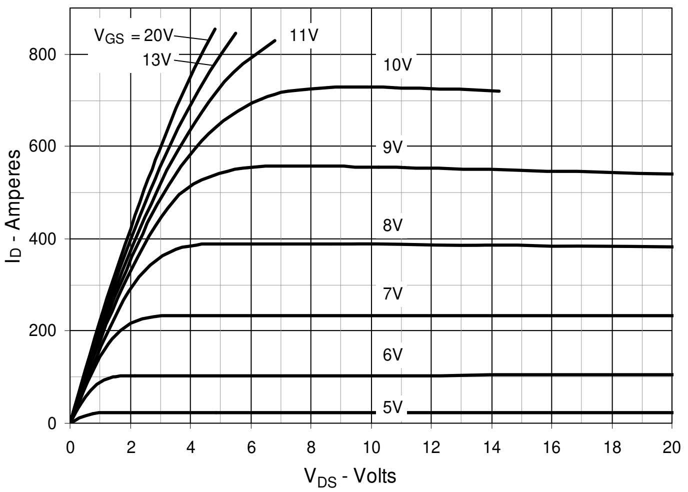


Fig. 3. Output Characteristics @ T_J = 125ºC

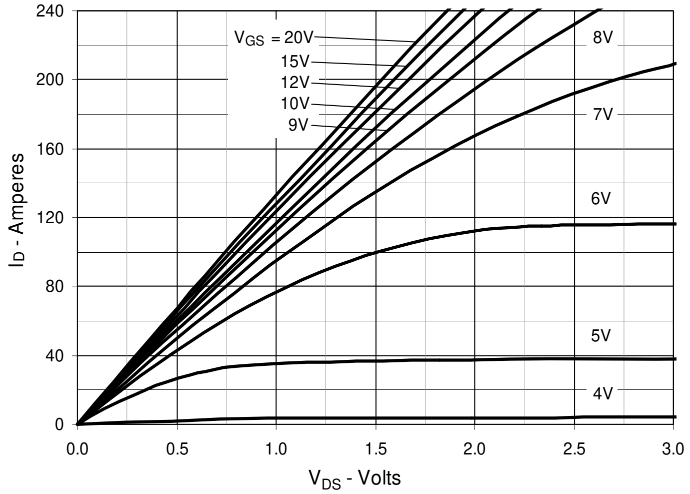


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 120A Value vs. Junction Temperature

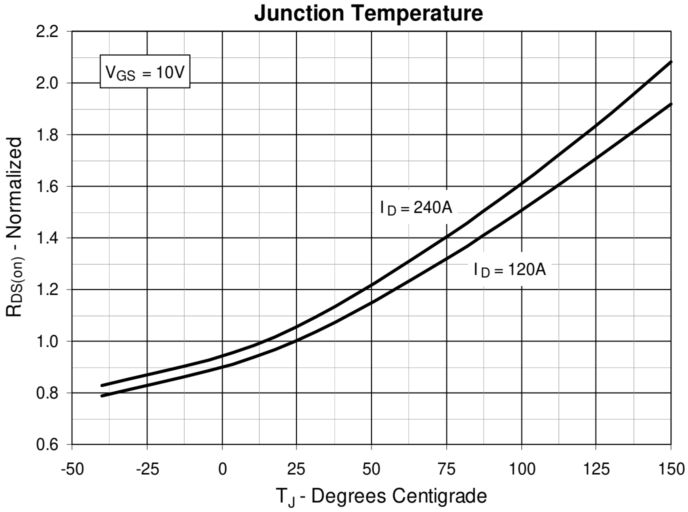


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 120A Value vs. Drain Current

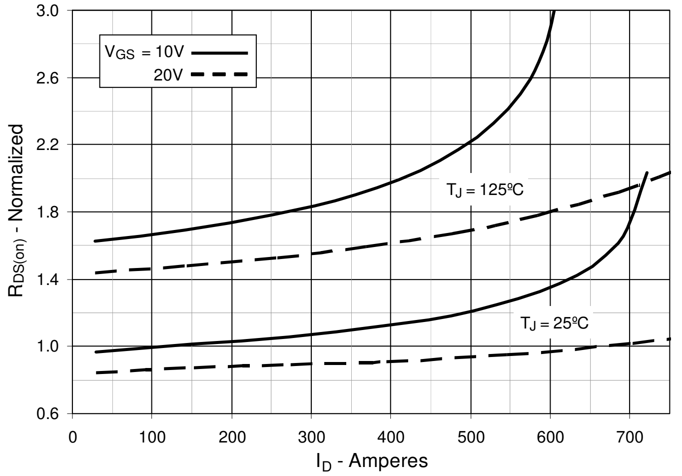


Fig. 6. Maximum Drain Current vs. Case Temperature

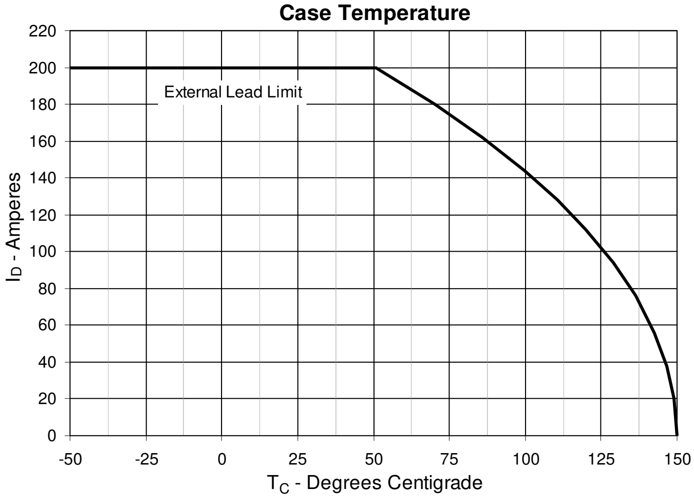


Fig. 7. Input Admittance

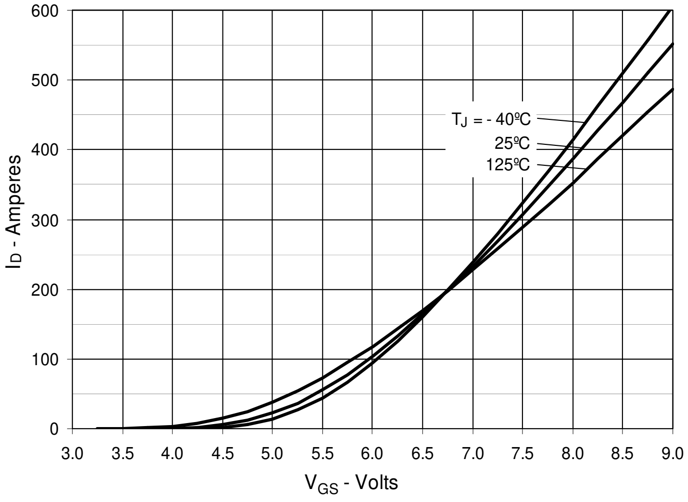


Fig. 8. Transconductance

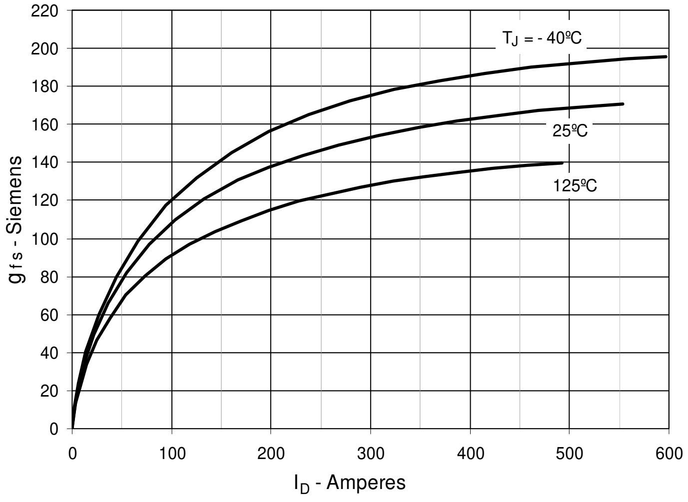


Fig. 9. Forward Voltage Drop of Intrinsic Diode

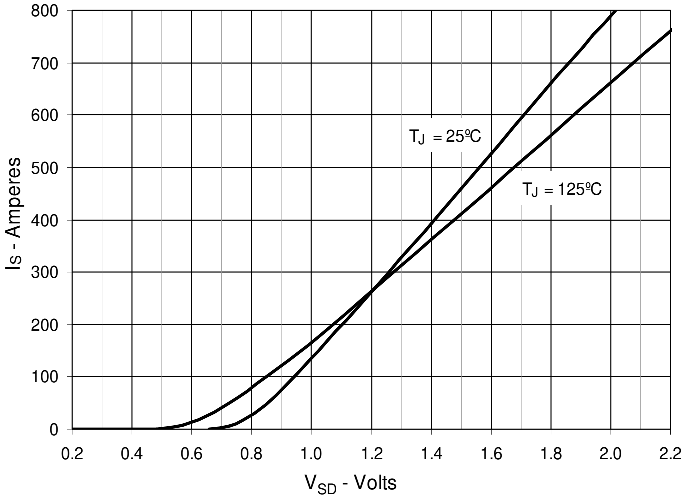


Fig. 10. Gate Charge

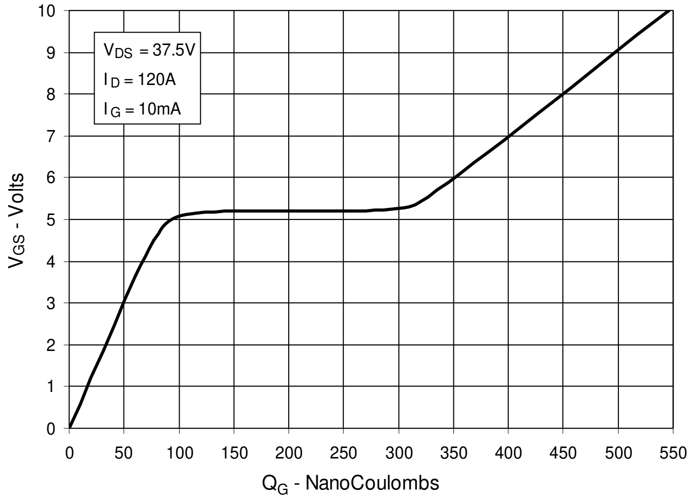


Fig. 11. Capacitance

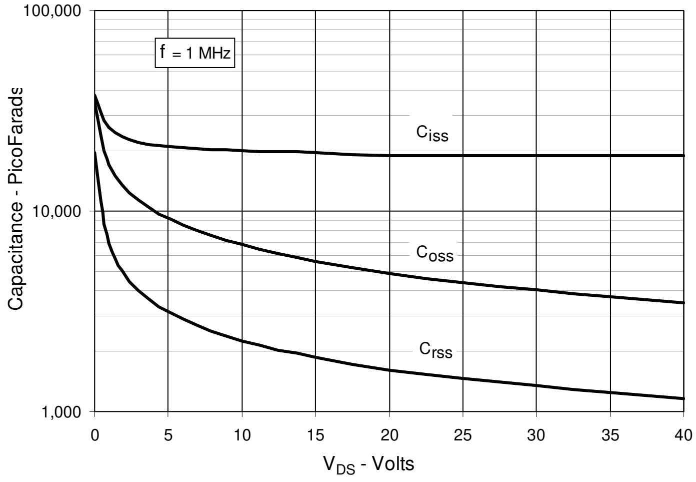


Fig. 12. Maximum Transient Thermal Impedance

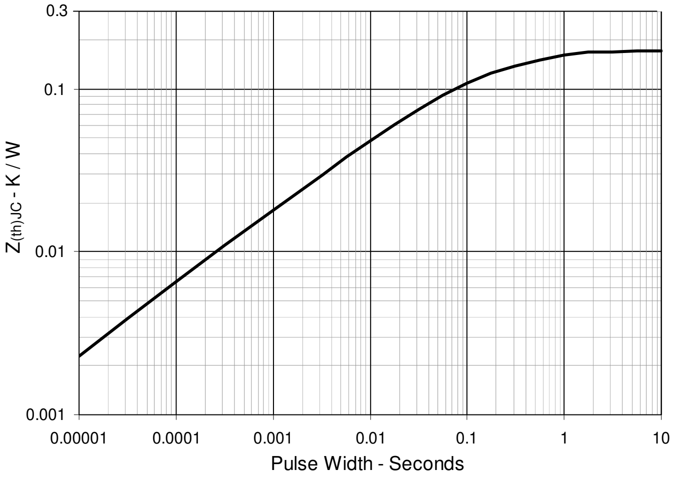


Fig. 13. Forward-Bias Safe Operating Area @ T_C = 25ºC

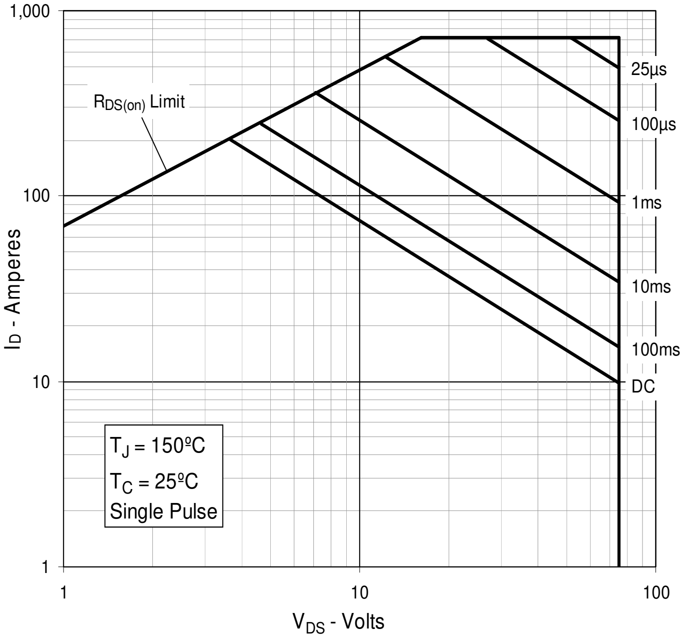
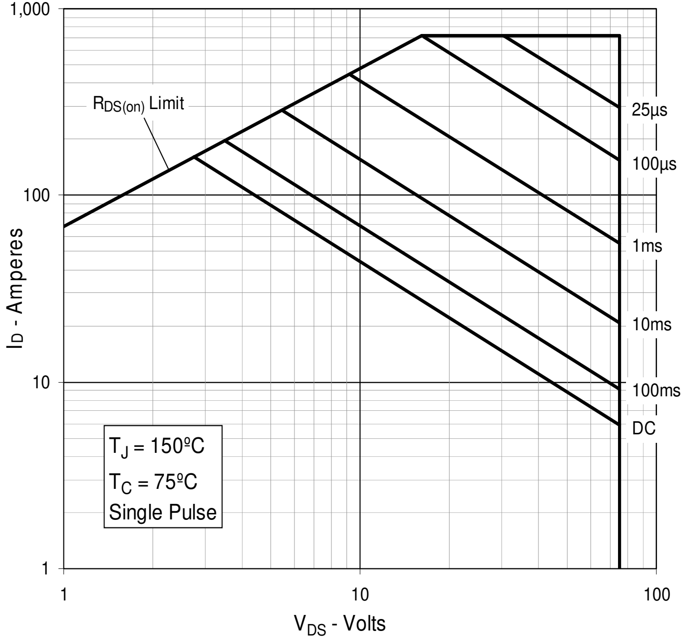


Fig. 14. Forward-Bias Safe Operating Area @ T_C = 75ºC



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