



**THE DATASHEET OF
IXTN60N50L2**

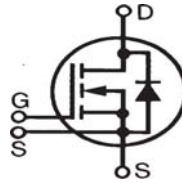


LinearL2™
Power MOSFET
w/Extended FBSOA

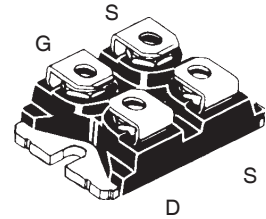
IXTN60N50L2

$V_{DSS} = 500V$
 $I_{D25} = 53A$
 $R_{DS(on)} \leq 100m\Omega$

N-Channel Enhancement Mode
 Extended FBSOA



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}	$T_J = 25^\circ C$ to $150^\circ C$	500	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$	53	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	150	A
I_A	$T_C = 25^\circ C$	60	A
E_{AS}	$T_C = 25^\circ C$	3	J
P_D	$T_C = 25^\circ C$	735	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
V_{ISOL}	50/60 Hz, RMS $t = 1$ minute	2500	V~
	$I_{ISOL} \leq 1mA$ $t = 1$ 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

Features

- Designed for linear operation
- International standard package
- Molding epoxy meets UL94 V-0 flammability classification
- miniBLOC with Aluminium nitride isolation
- Guaranteed FBSOA at $75^\circ C$

Applications

- Programmable loads
- Current regulators
- DC-DC converters
- Battery chargers
- DC choppers
- Temperature and lighting controls

Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions ($T_J = 25^\circ C$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 1mA$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2.5		V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$			50 μA
				5 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 30A$, Note 1			100 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
g_{fs}	$V_{DS} = 10\text{V}, I_D = 30\text{A}$, Note 1	18	25	32	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		24		nF
C_{oss}			1325		pF
C_{rss}			172		pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 15\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 30\text{A}$ $R_G = 0.5\Omega$ (External)		40		ns
t_r			40		ns
$t_{d(off)}$			165		ns
t_f			38		ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 30\text{A}$		610		nC
Q_{gs}			130		nC
Q_{gd}			365		nC
R_{thJC}				0.17	$^\circ\text{C}/\text{W}$
R_{thCS}		0.05			$^\circ\text{C}/\text{W}$

Safe Operating Area Specification

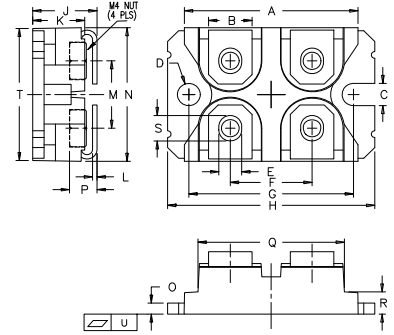
Symbol	Test Conditions	Min.	Typ.	Max.
SOA	$V_{DS} = 400\text{V}, I_D = 0.9\text{A}, T_C = 75^\circ\text{C}, t_p = 3\text{s}$	360		W

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
I_S	$V_{GS} = 0\text{V}$			60	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			240	A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{V}$, Note 1			1.5	V
t_{rr}	$I_F = 60\text{A}, -di/dt = 100\text{A}/\mu\text{s}$		980		ns
I_{RM}				73	
Q_{RM}	$V_R = 100\text{V}, V_{GS} = 0\text{V}$		35.8		μC

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

SOT-227B (IXTN) Outline



(M4 screws (4x) supplied)

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	1.496	1.505	38.00	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

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	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

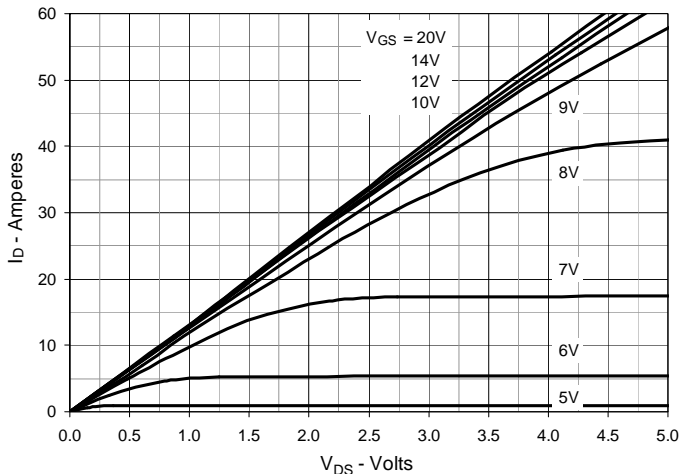


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

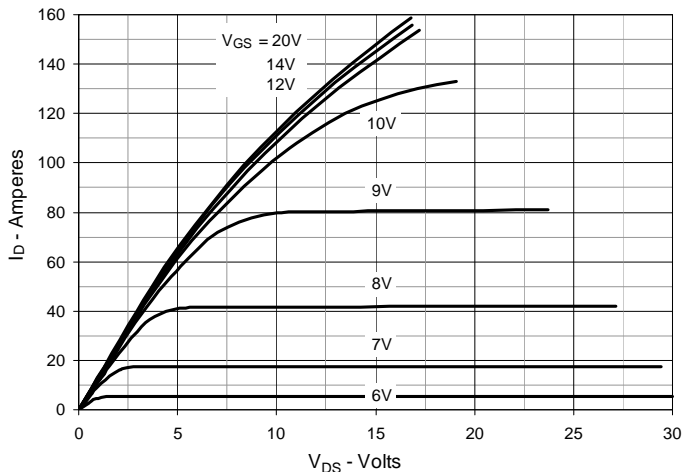


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

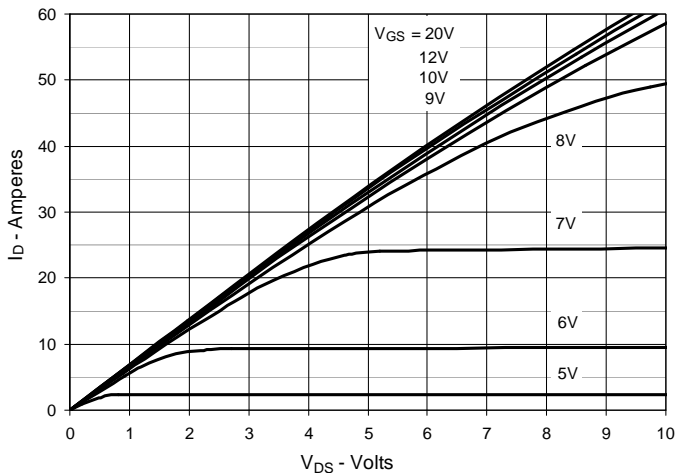


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 30\text{A}$ Value vs. Junction Temperature

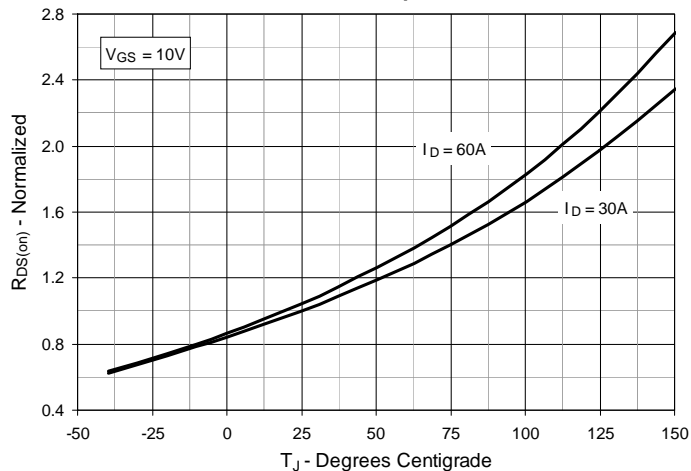


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 30\text{A}$ Value vs. Drain Current

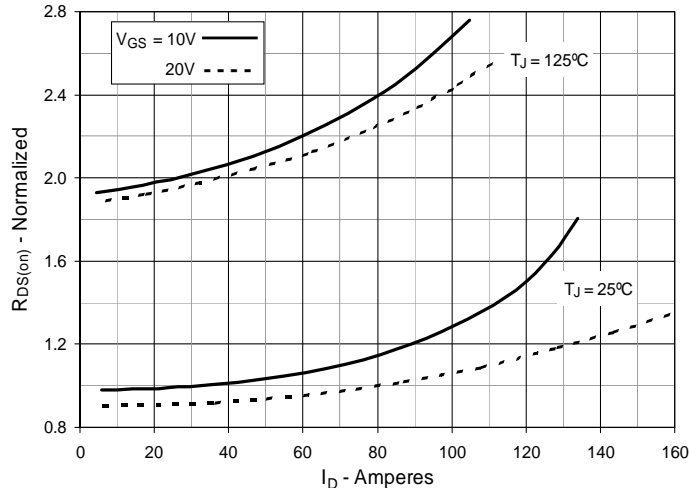


Fig. 6. Maximum Drain Current vs. Case Temperature

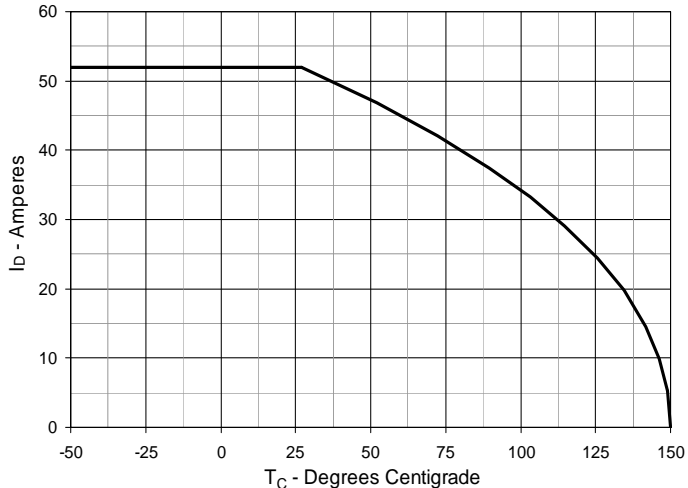


Fig. 7. Input Admittance

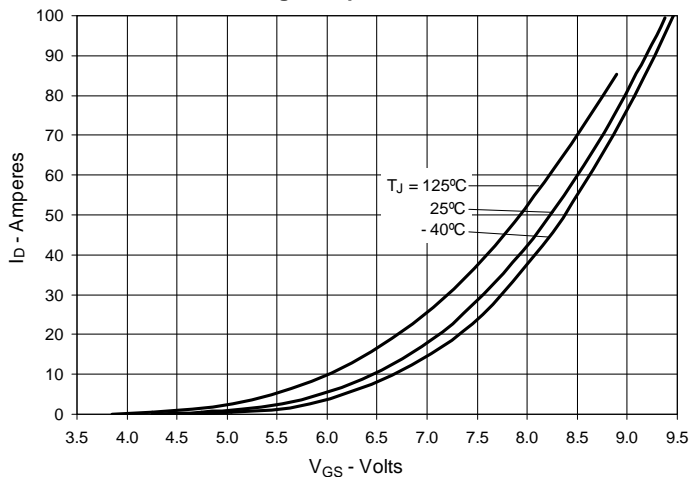


Fig. 8. Transconductance

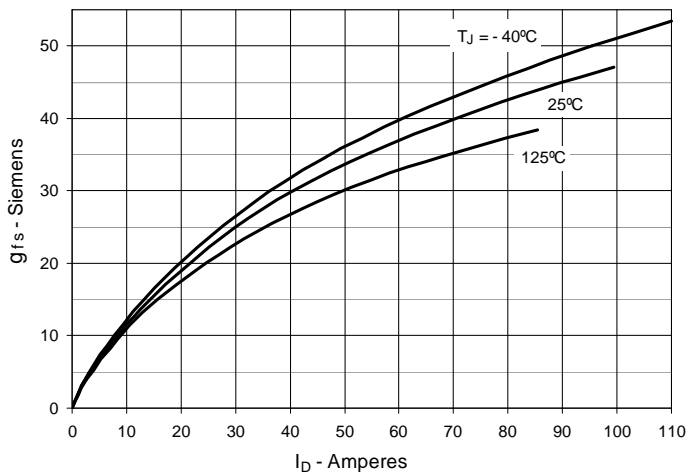


Fig. 9. Forward Voltage Drop of Intrinsic Diode

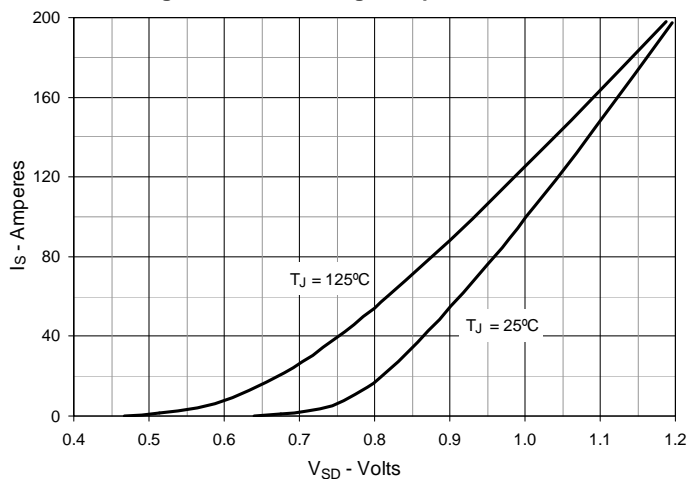


Fig. 10. Gate Charge

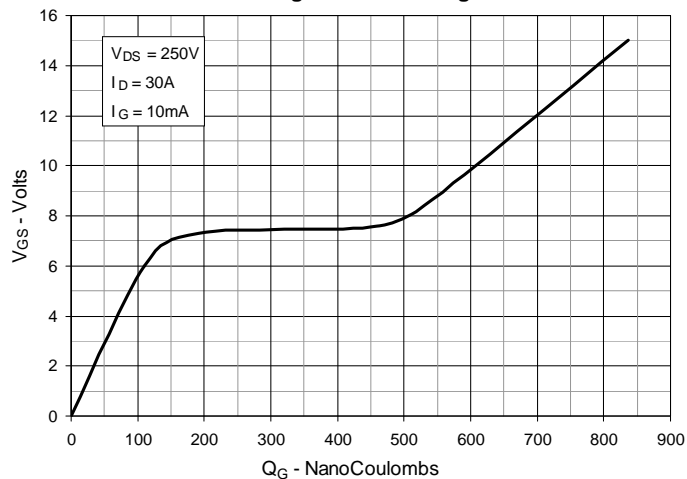


Fig. 11. Capacitance

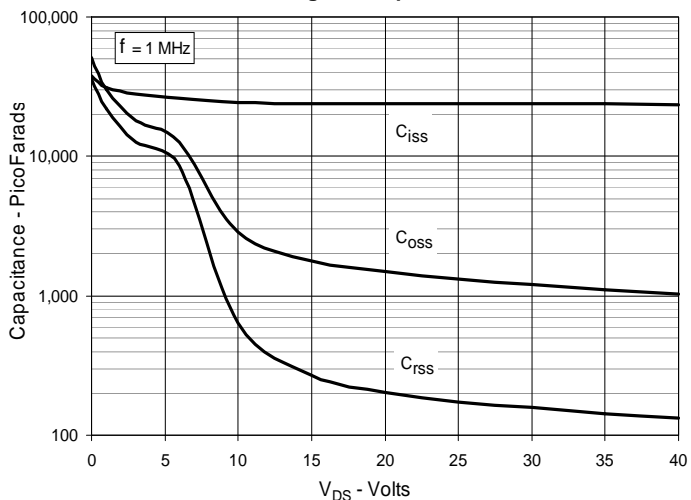


Fig. 12. Maximum Transient Thermal Impedance

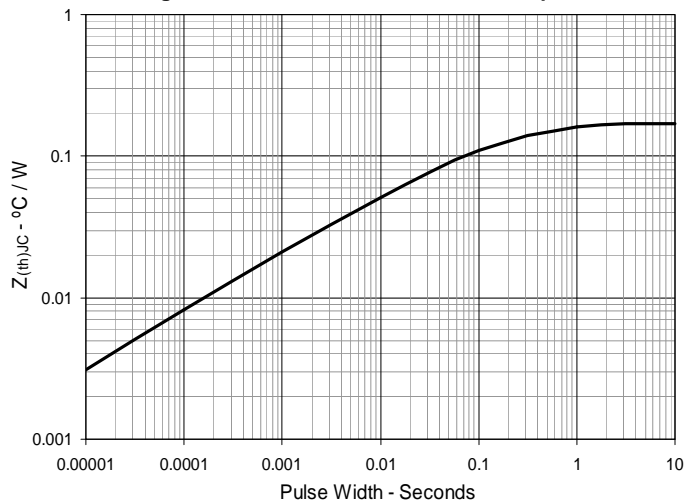


Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$

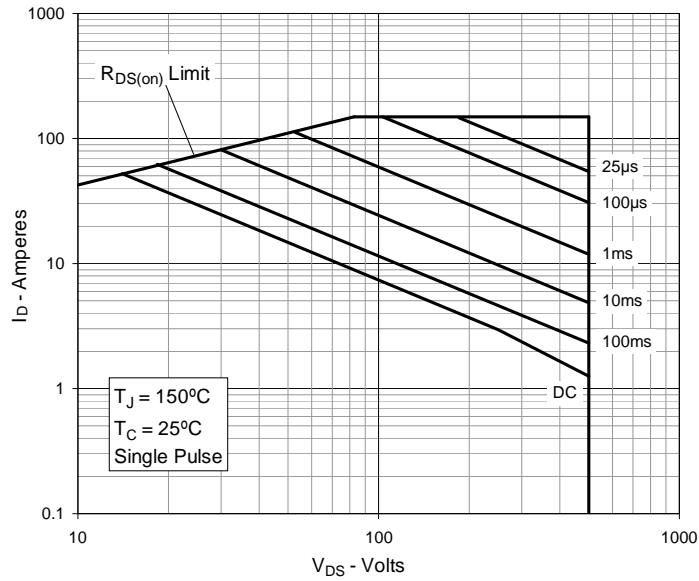
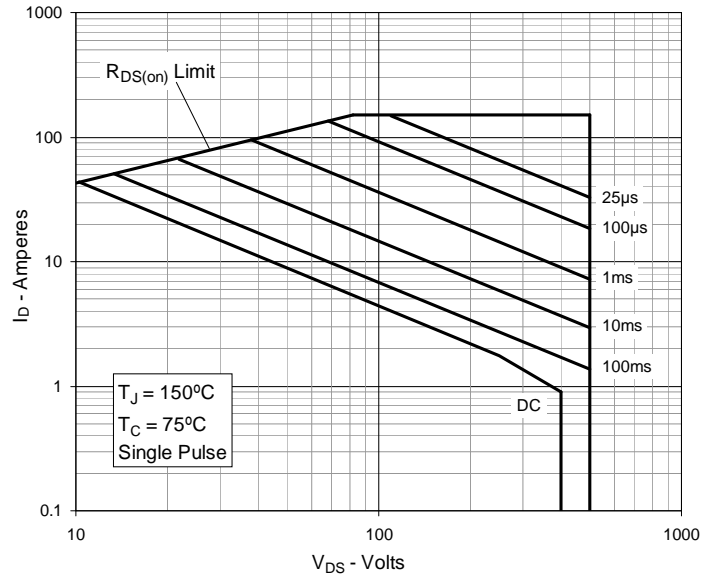


Fig. 14. Forward-Bias Safe Operating Area
@ $T_C = 75^\circ\text{C}$





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