

**Linear L2™ Power  
MOSFET w/Extended  
FBSOA**

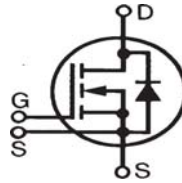
**IXTN90N25L2**

$$V_{DSS} = 250V$$

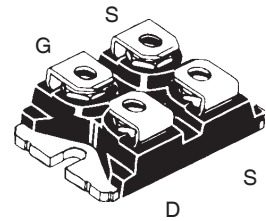
$$I_{D25} = 90A$$

$$R_{DS(on)} \leq 33m\Omega$$

N-Channel Enhancement Mode  
Guaranteed FBSOA  
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	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	250	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1M\Omega$	250	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	90	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$	360	A
$I_A$	$T_C = 25^\circ\text{C}$	45	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	3	J
$P_D$	$T_C = 25^\circ\text{C}$	735	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6mm (0.062 in.) from Case for 10s	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $t = 1$ Minute	2500	V~
	$I_{ISOL} \leq 1\text{mA}$ $t = 1$ Second	3000	V~
$M_d$	Mounting Torque	1.5/13	Nm/lb.in.
	Terminal Connection Torque	1.3/11.5	Nm/lb.in.
<b>Weight</b>		30	g

**Features**

- Designed for Linear Operation
- International Standard Package
- Guaranteed FBSOA at  $75^\circ\text{C}$
- Avalanche Rated
- Molding Epoxy Meets UL94 V-0 Flammability Classification
- MiniBLOC with Aluminium Nitride Isolation

**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 ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 1\text{mA}$	250		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 3\text{mA}$	2.0		V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			50 $\mu\text{A}$ 2.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1			33 m $\Omega$

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values			
		Min.	Typ.	Max.	
$g_{fs}$	$V_{DS} = 10\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1	35	50	65	S
$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		23		nF
$C_{oss}$			2140		pF
$C_{rss}$			360		pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$ $R_G = 1\Omega$ (External)		50		ns
$t_r$			175		ns
$t_{d(off)}$			40		ns
$t_f$			160		ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$		640		nC
$Q_{gs}$			125		nC
$Q_{gd}$			385		nC
$R_{thJC}$				0.17	$^\circ\text{C/W}$
$R_{thCS}$		0.05			$^\circ\text{C/W}$

### Safe Operating Area Specification

Symbol	Test Conditions	Min.	Typ.	Max.
SOA	$V_{DS} = 250\text{V}$ , $I_D = 1.4\text{A}$ , $T_C = 75^\circ\text{C}$ , $t_p = 3\text{s}$	350		W

### Source-Drain Diode

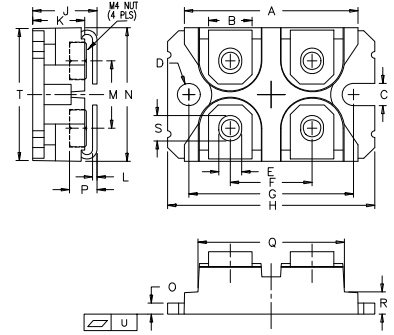
Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values			
		Min.	Typ.	Max.	
$I_s$	$V_{GS} = 0\text{V}$			90	A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			360	A
$V_{SD}$	$I_F = 45\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1			1.5	V
$t_{rr}$	$I_F = 45\text{A}$ , $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 80\text{V}$ , $V_{GS} = 0\text{V}$		266		ns
$I_{RM}$			23		A
$Q_{RM}$			3.0		$\mu\text{C}$

Note 1: Pulse Test,  $t \leq 300\mu\text{s}$ ; Duty Cycle,  $d \leq 2\%$ .

### PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

### SOT-227B (IXTN) Outline



(M4 screws (4x) supplied)

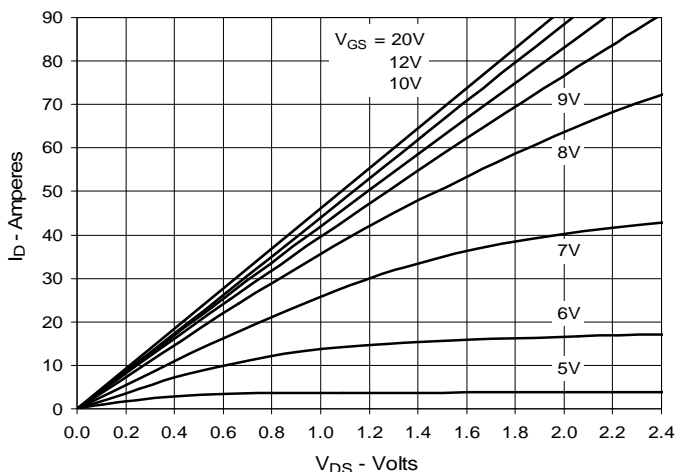
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.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

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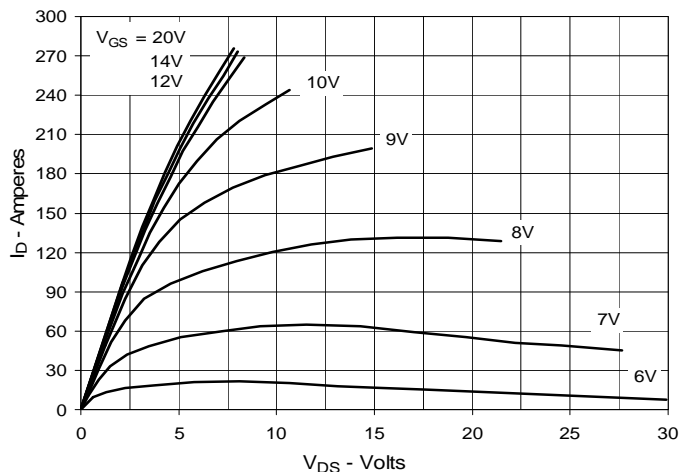
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

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	7,157,338 B2
4,850,072	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	

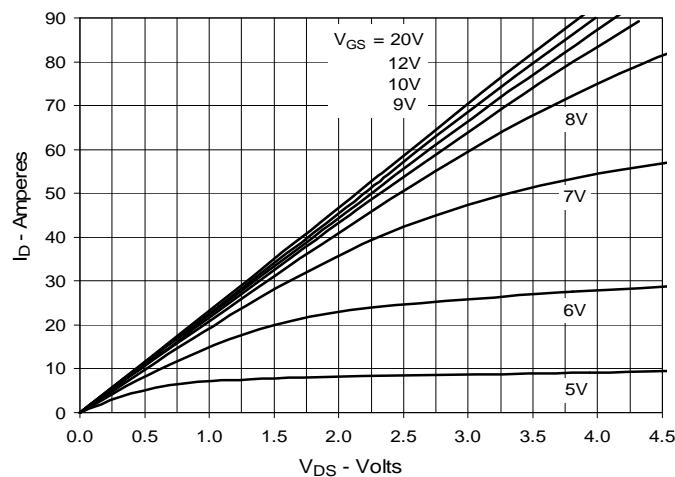
**Fig. 1. Output Characteristics @ 25°C**



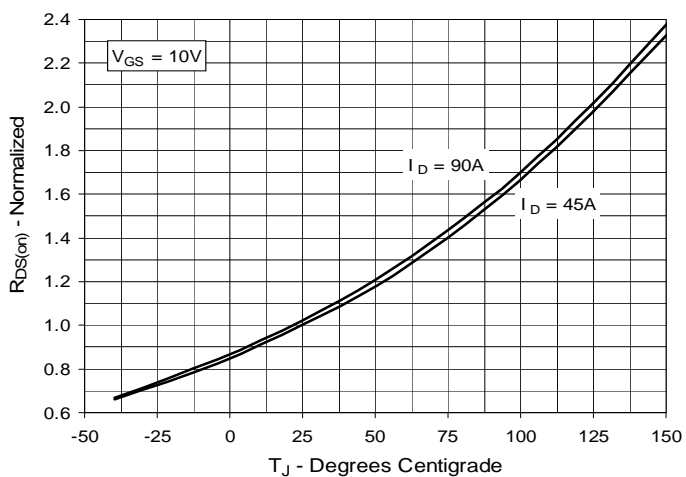
**Fig. 2. Extended Output Characteristics @ 25°C**



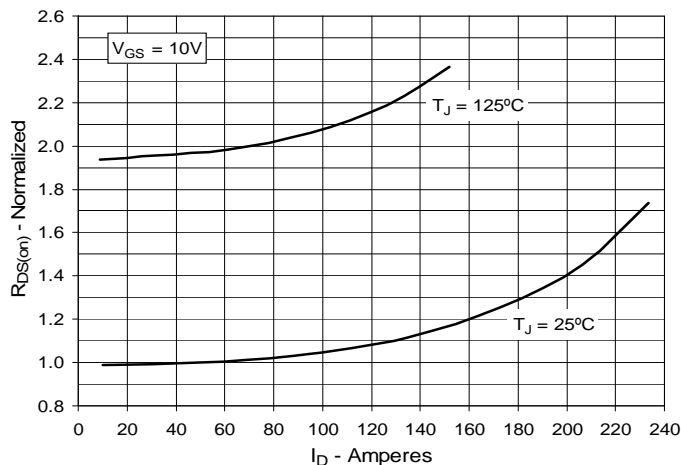
**Fig. 3. Output Characteristics @ 125°C**



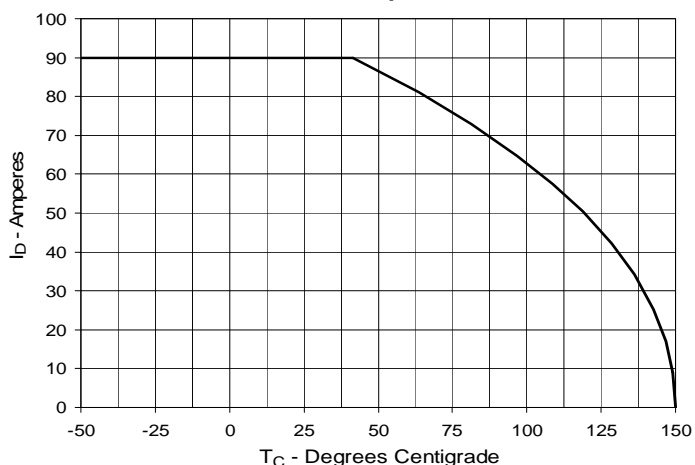
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 45A$  Value vs. Junction Temperature**



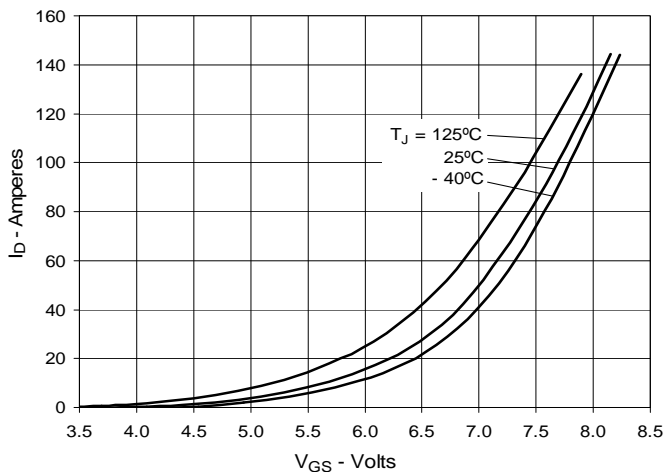
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 45A$  Value vs. Drain Current**



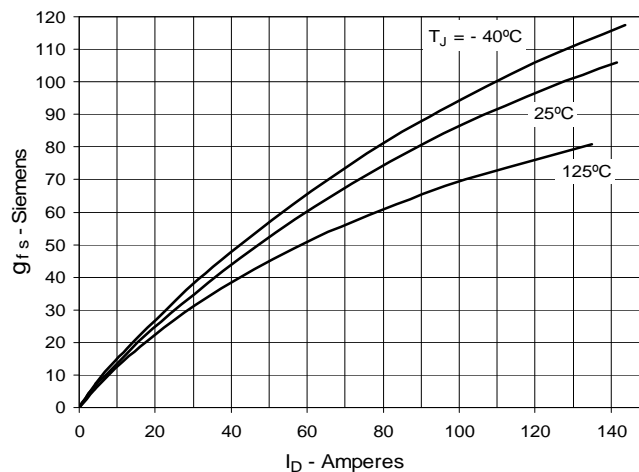
**Fig. 6. Maximum Drain Current vs. Case Temperature**



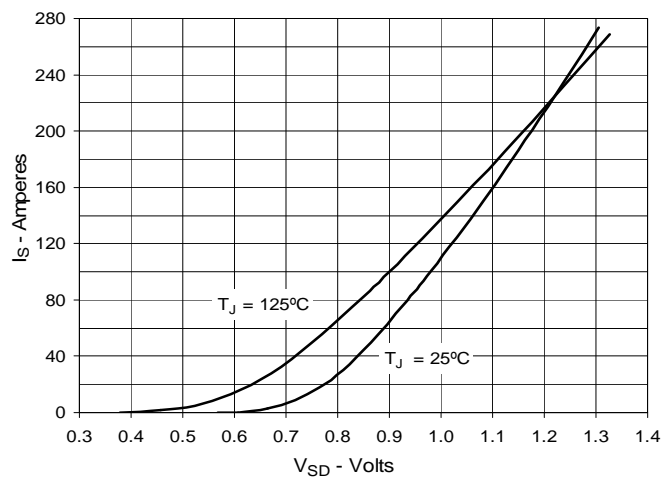
**Fig. 7. Input Admittance**



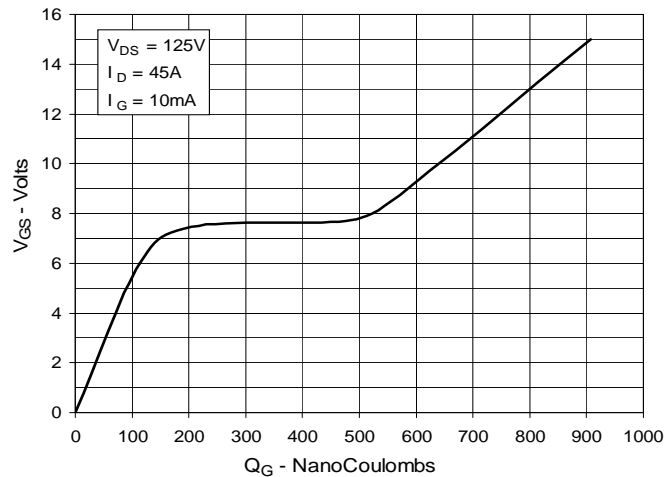
**Fig. 8. Transconductance**



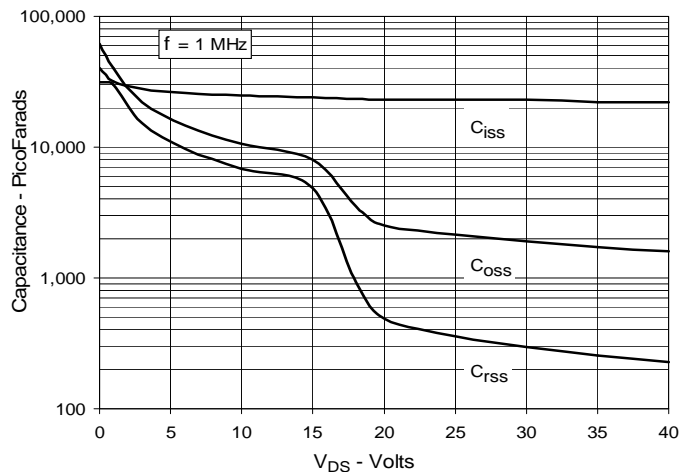
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



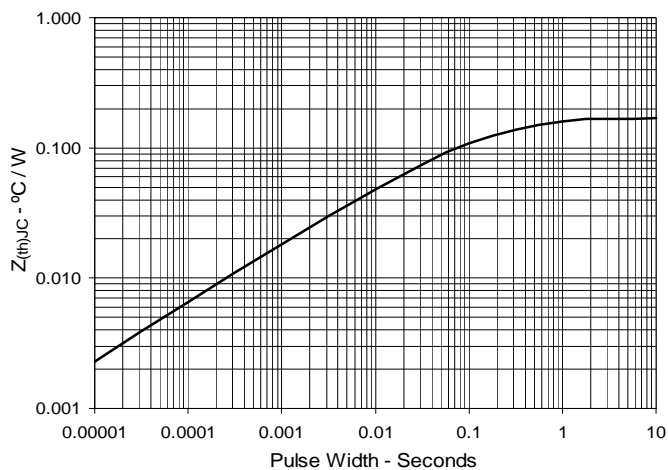
**Fig. 10. Gate Charge**



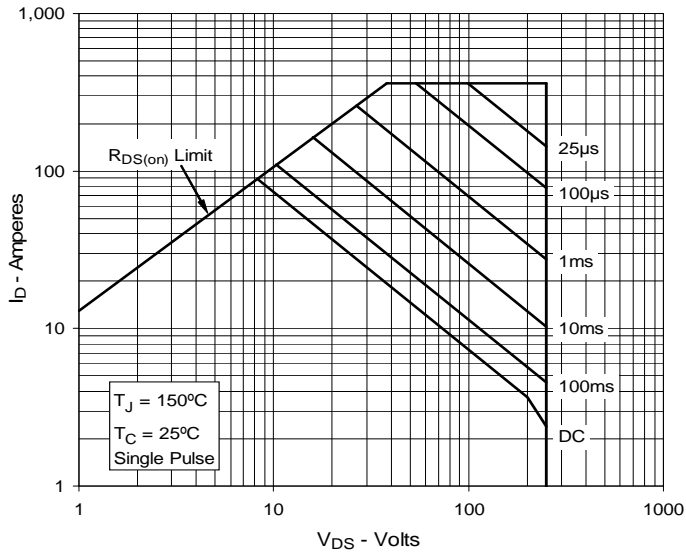
**Fig. 11. Capacitance**



**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  
@  $T_C = 75^\circ\text{C}$**

