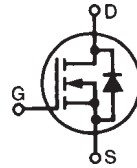


**LinearL2™ Power  
MOSFET w/Extended  
FBSOA**
**IXTK90N25L2  
IXTX90N25L2**

 N-Channel Enhancement Mode  
Avalanche Rated


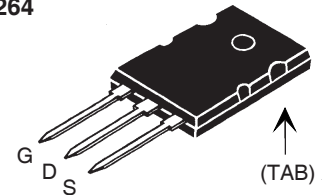
$$V_{DSS} = 250V$$

$$I_{D25} = 90A$$

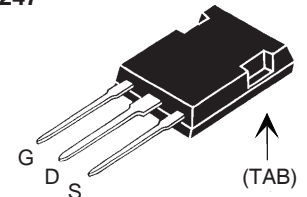
$$R_{DS(on)} \leq 33m\Omega$$

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	250	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$	250	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ C$	90	A
$I_{DM}$	$T_C = 25^\circ C$ , pulse width limited by $T_{JM}$	360	A
$I_A$	$T_C = 25^\circ C$	45	A
$E_{AS}$	$T_C = 25^\circ C$	3	J
$P_D$	$T_C = 25^\circ C$	960	W
$T_J$		-55...+150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55...+150	$^\circ C$
$T_L$	1.6mm (0.063 in.) from case for 10s	300	$^\circ C$
$T_{SOLD}$	Plastic body for 10s	260	$^\circ C$
$M_d$	Mounting torque (IXTK)	1.13/10	Nm/lb.in.
$F_c$	Mounting Force (IXTX)	20..120 / 4.5..27	N/lb.
<b>Weight</b>	TO-264	10	g
	PLUS247	6	g

TO-264



PLUS247



G = Gate      D = Drain  
S = Source    TAB = Drain

**Features**

- Designed for linear operation
- International standard packages
- Avalanche rated
- Guaranteed FBSOA at  $75^\circ C$

**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	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 1mA$	250		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 3mA$	2.0		V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$			50 $\mu A$
	$V_{GS} = 0V$ $T_J = 125^\circ C$			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
$R_{thJC}$				0.13	$^\circ\text{C/W}$
$R_{thCS}$				0.15	$^\circ\text{C/W}$

### Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 250\text{V}$ , $I_D = 2.3\text{A}$ , $T_C = 75^\circ\text{C}$ , $T_p = 5\text{s}$	575		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		$\mu\text{C}$

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

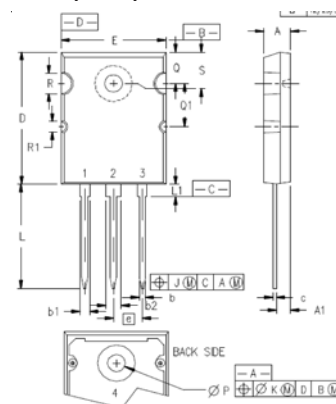
### PRELIMINARY TECHNICAL INFORMATION

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.

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

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

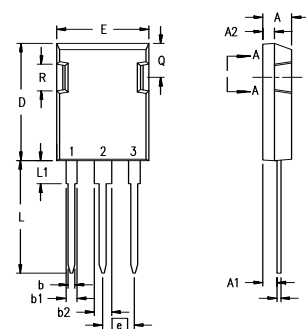
### TO-264 (IXTK) Outline



1 - GATE  
2, 4 - DRAIN (COLLECTOR)  
3 - SOURCE (EMITTER)

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215 BSC		5.46 BSC	
J	.000	.010	0.00	0.25
K	.000	.010	0.00	0.25
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
ØP	.122	.138	3.10	3.51
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36
S	.243	.253	6.17	6.43

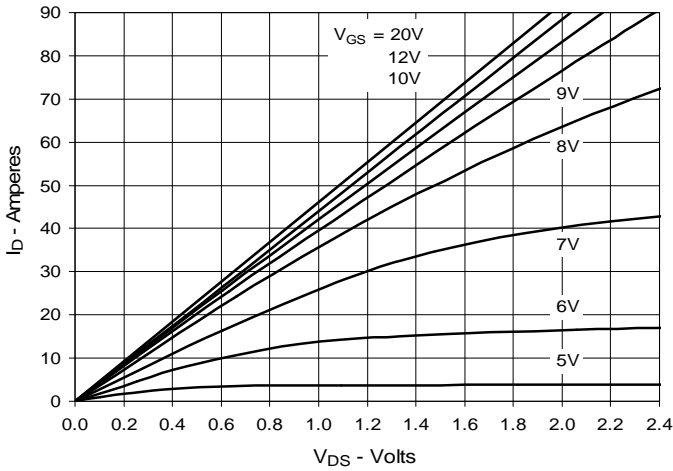
### PLUS 247™ (IXTX) Outline



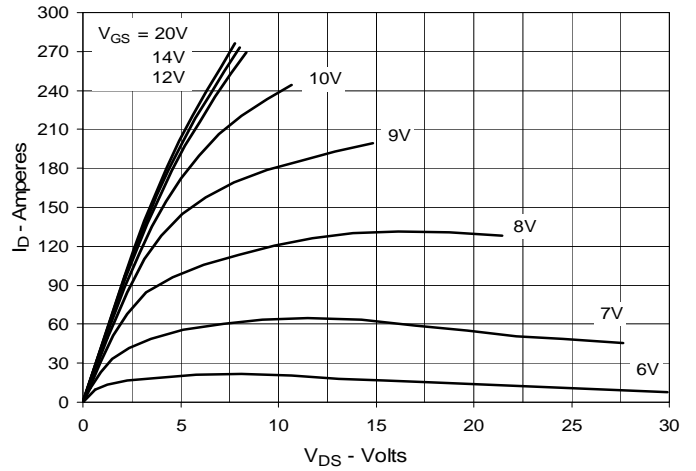
Terminals: 1 - Gate  
2 - Drain (Collector)  
3 - Source (Emitter)  
4 - Drain (Collector)

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

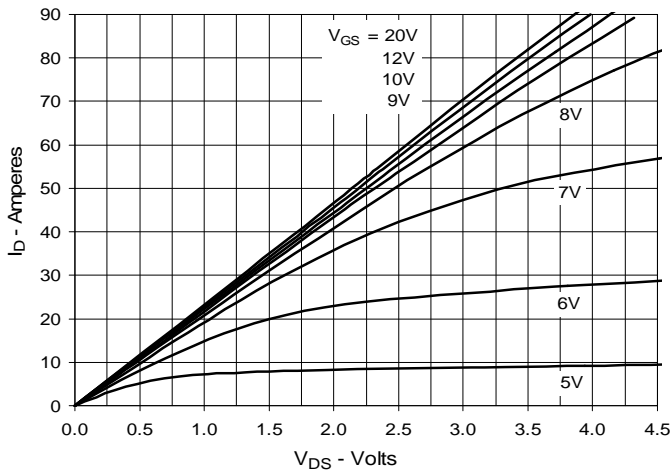
**Fig. 1. Output Characteristics**  
**@ 25°C**



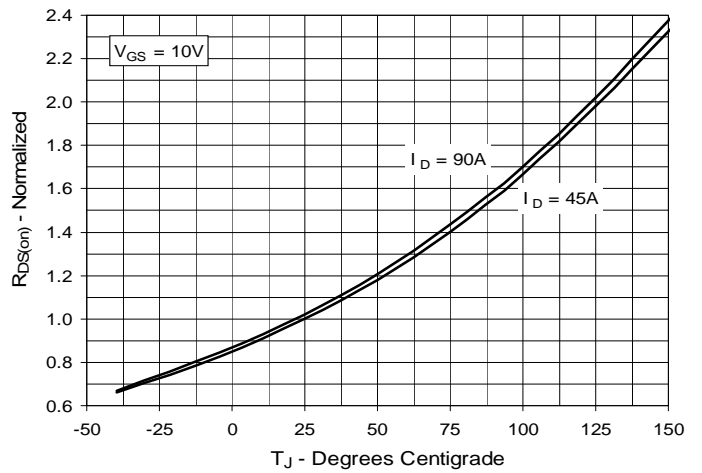
**Fig. 2. Extended Output Characteristics**  
**@ 25°C**



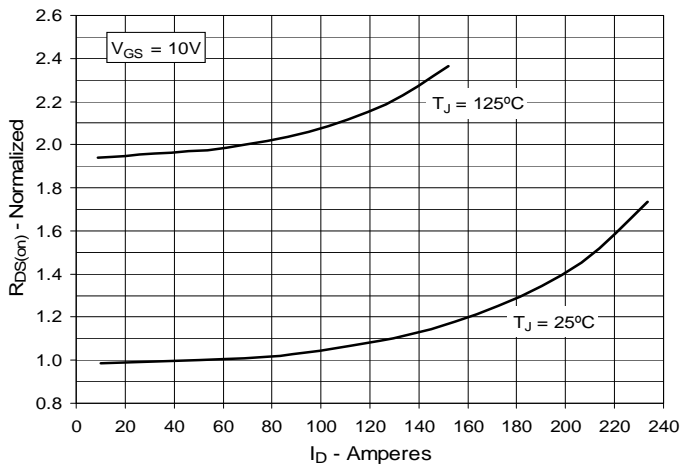
**Fig. 3. Output Characteristics**  
**@ 125°C**



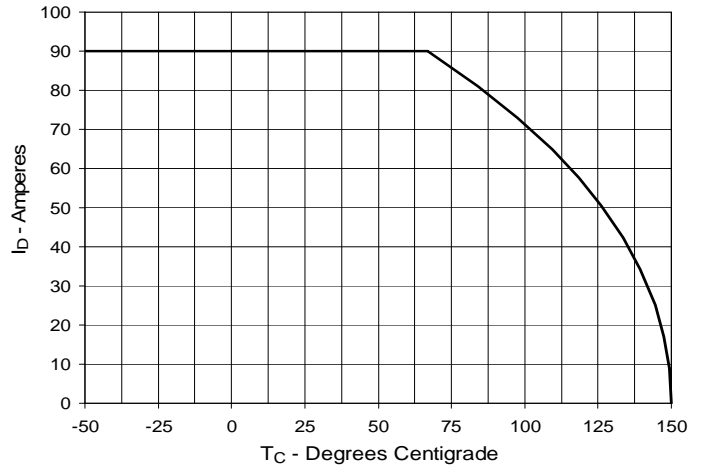
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 45\text{A}$  Value**  
**vs. Junction Temperature**



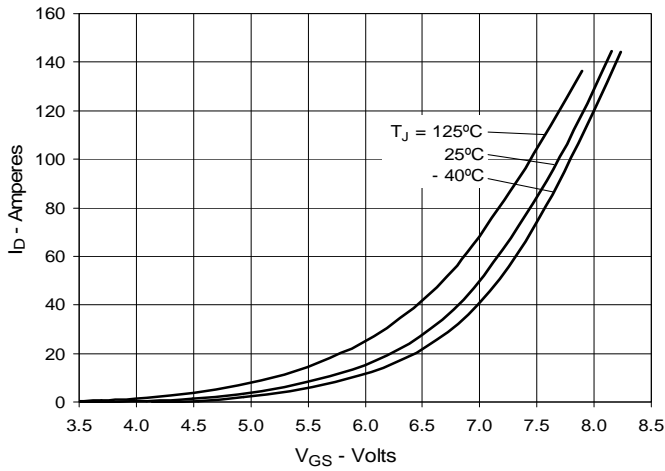
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 45\text{A}$  Value**  
**vs. Drain Current**



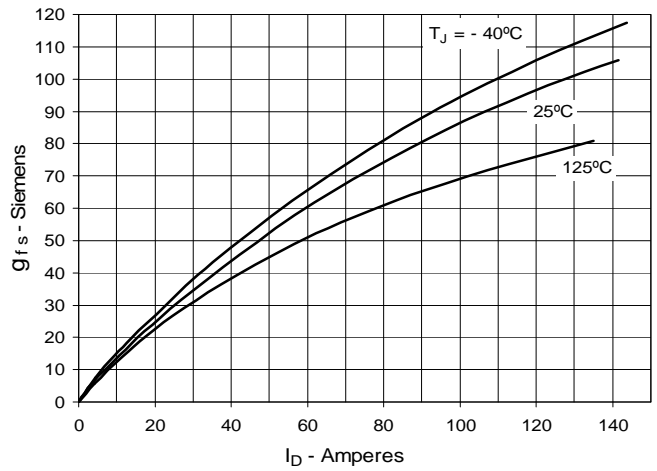
**Fig. 6. Maximum Drain Current vs.**  
**Case Temperature**



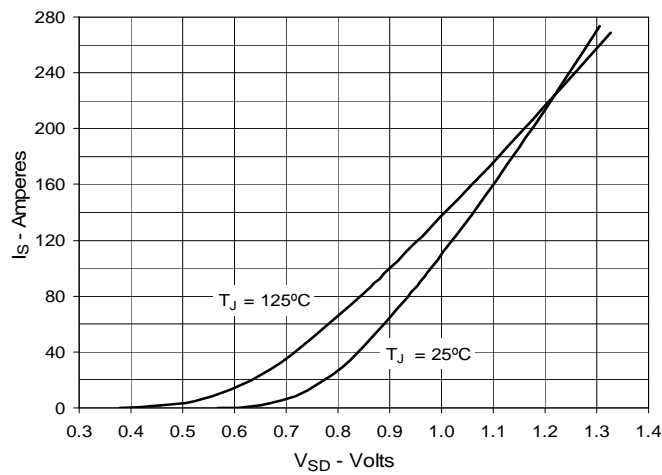
**Fig. 7. Input Admittance**



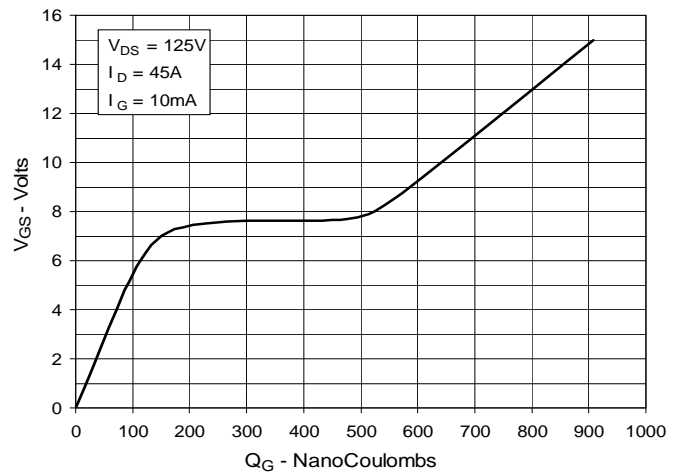
**Fig. 8. Transconductance**



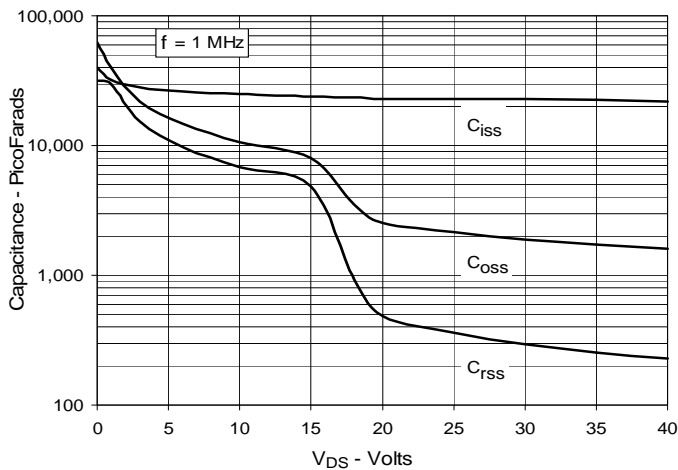
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



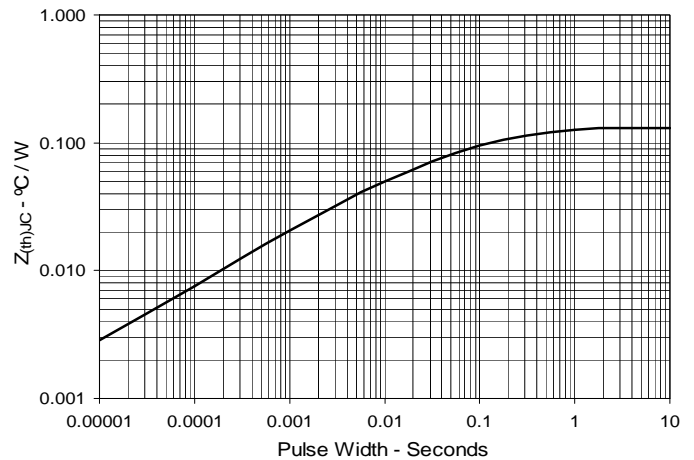
**Fig. 10. Gate Charge**



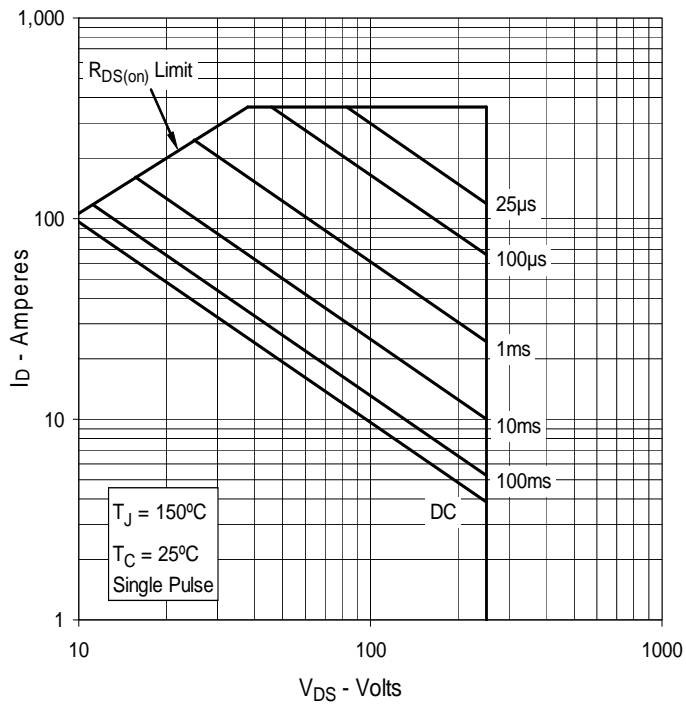
**Fig. 11. Capacitance**



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

