�ΙΧΥS

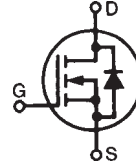## LinearL2™ Power MOSFET w/Extended FBSOA
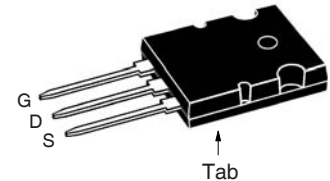
IXTK60N50L2
IXTX60N50L2

V_{DSS} = 500V
I_{D25} = 60A
$R_{DS(on)}$ ≤ 100mΩ
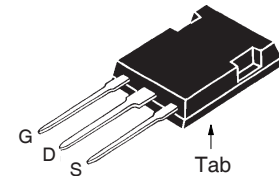
N-Channel Enhancement Mode
Avalanche Rated

TO-264 (IXTK)

G
D
S

Tab

PLUS247 (IXTX)

G
D
S

Tab

G = Gate   D = Drain
S = Source   Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	500	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	60	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	150	A
I_A	T_C = 25°C	60	A
E_{AS}	T_C = 25°C	3	J
P_D	T_C = 25°C	960	W
T_J		-55...+150	°C
T_{JM}		150	°C
T_{stg}		-55...+150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting torque (IXTK)	1.13/10	Nm/lb.in
F_C	Mounting Force (IXTX)	20..120 / 4.5..27	N/lb
Weight	TO-264	10	g
	PLUS247	6	g

Features

- Designed for linear operation
- International standard packages
- Avalanche rated
- Guaranteed FBSOA at 75°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		
	(T_J = 25°C, unless otherwise specified)	Min.	Typ.	Max.
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	500			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	2.5		4.5	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			50	µA
	T_J = 125°C			5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Note 1			100	mΩ

IXYS

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10V, I_D = 0.5 • I_{D25}, Note 1	18	25	32	S
C_{iss}			24		nF
C_{oss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1325		pF
C_{rss}			172		pF
$t_{d(on)}$	**Resistive Switching Times**		40		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		40		ns
$t_{d(off)}$	R_G = 0.5Ω (External)		165		ns
t_f			38		ns
$Q_{g(on)}$			610		nC
Q_{gs}	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		130		nC
Q_{gd}			365		nC
R_{thJC}				0.13	°C/W
R_{thCS}			0.15		°C/W

Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values			
		Min.	Typ.	Max.	
SOA	V_{DS} = 400V, I_D = 1.1A, T_C = 75°C, tp = 3s	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			60	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			240	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 60A, -di/dt = 100A/µs,		980		ns
I_{RM}	V_R = 100V, V_{GS} = 0V		73		A
Q_{RM}			35.8		µC

Notes: 1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.

TO-264 (IXTK) Outline

Terminals: 1 - Gate
2,4 - Drain
3 - Source

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	.215BSC		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
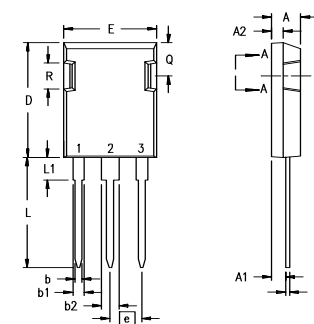
Terminals: 1 - Gate
2 - Drain
3 - Source

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	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 @ T$_J$ = 25ºC
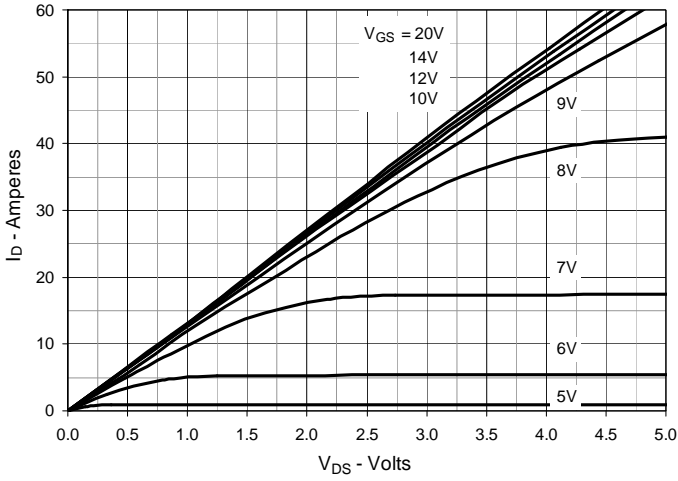
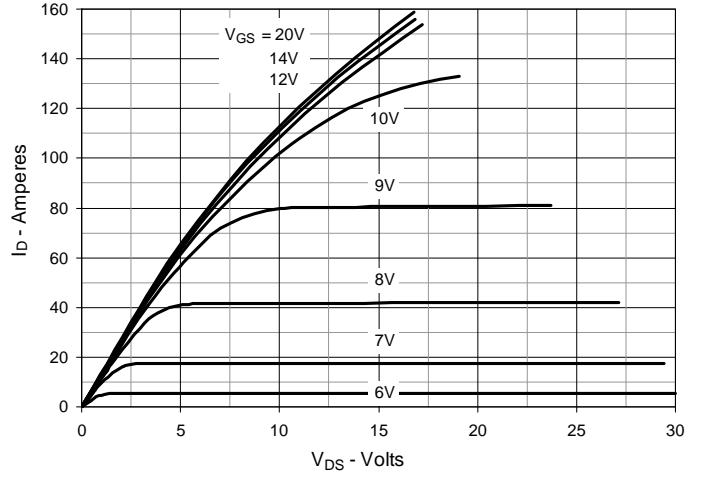**Fig. 2. Extended Output Characteristics @ T$_J$ = 25ºC**
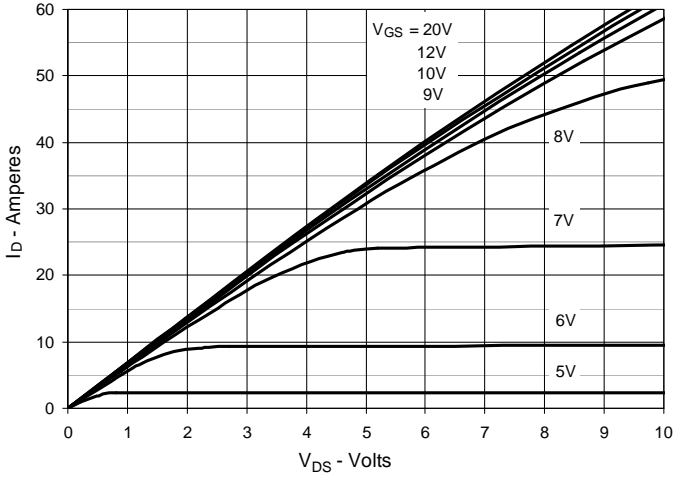

Fig. 3. Output Characteristics @ T$_J$ = 125ºC

Fig. 4. R$_{DS(on)}$ Normalized to I$_D$ = 30A Value vs.
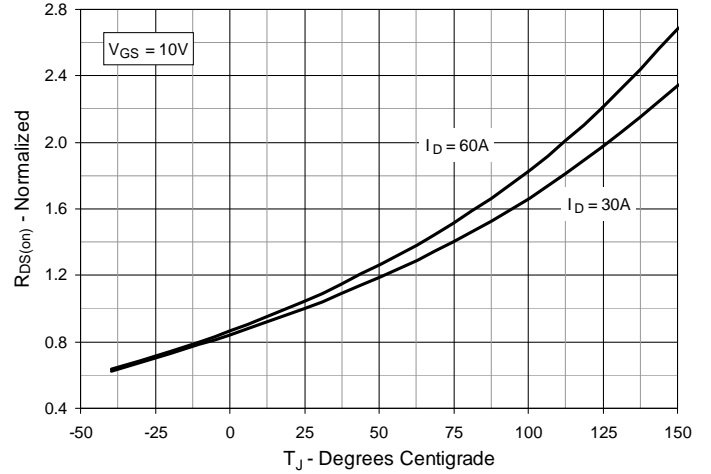**Junction Temperature**

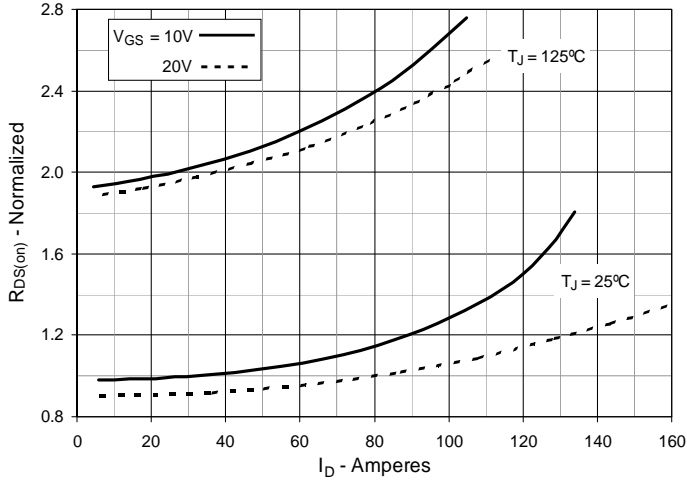**Fig. 5. R$_{DS(on)}$ Normalized to I$_D$ = 30A Value vs.**
Drain Current

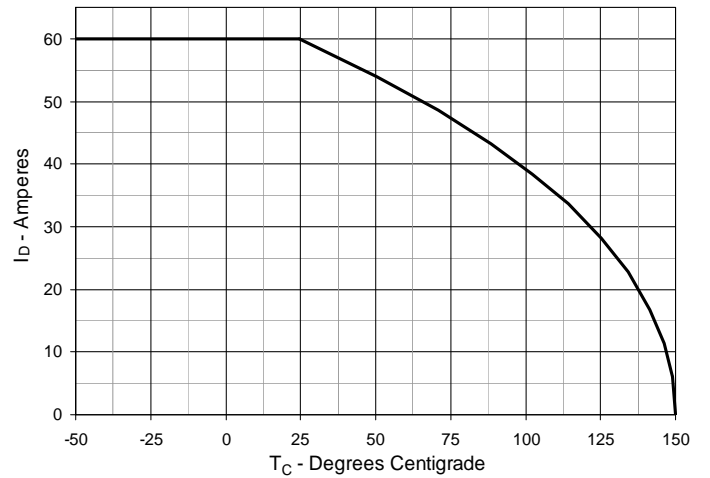**Fig. 6. Maximum Drain Current vs.**
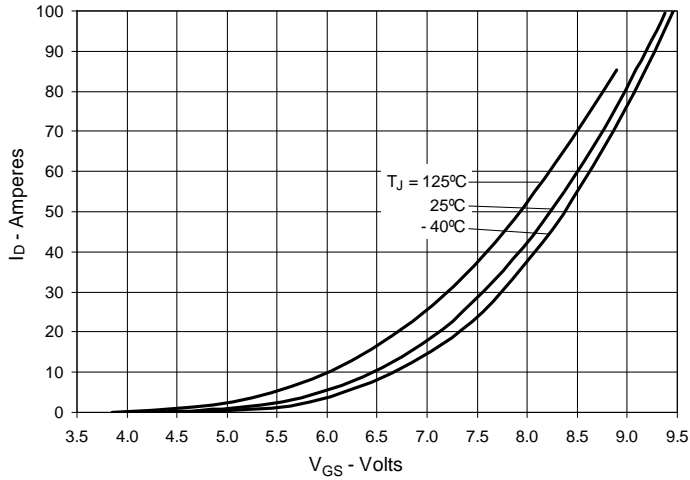**Case Temperature**

Fig. 7. Input Admittance

Fig. 8. Transconductance
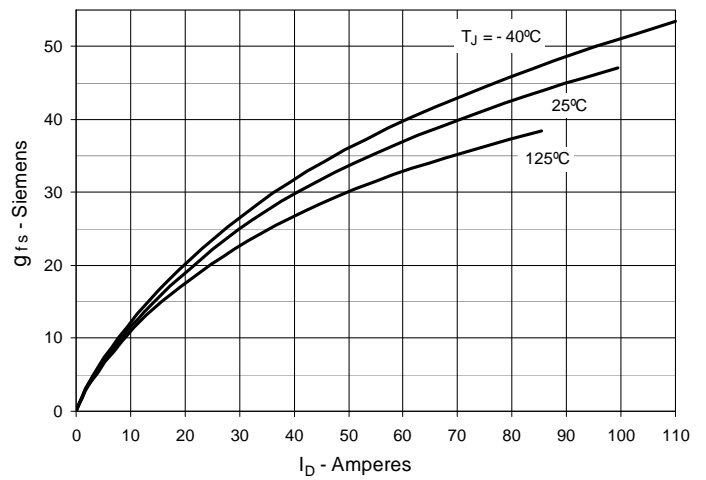
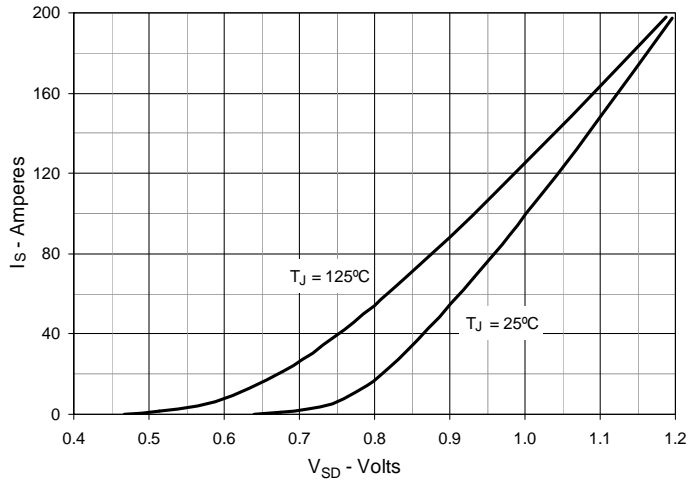**Fig. 9. Forward Voltage Drop of Intrinsic Diode**

Fig. 10. Gate Charge
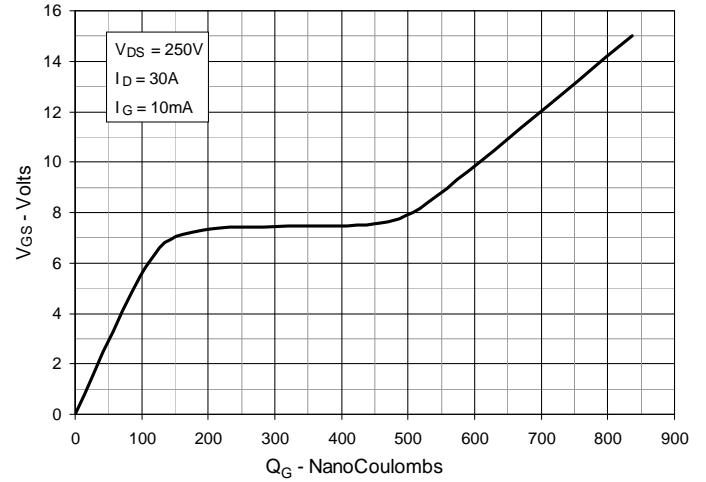
Fig. 11. Capacitance
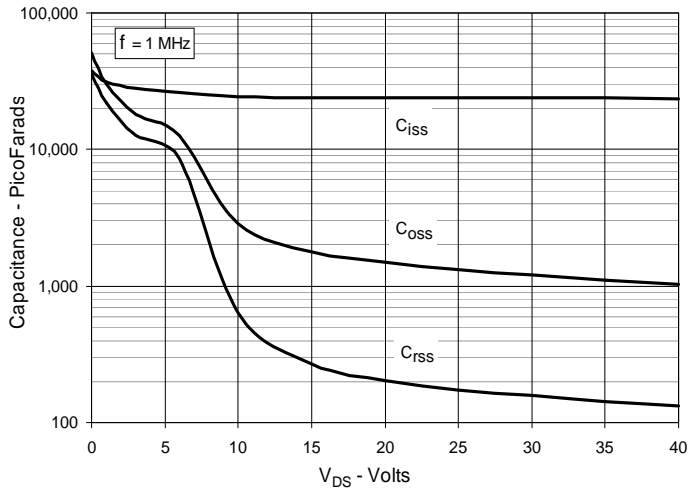
Fig. 12. Maximum Transient Thermal Impedance

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.
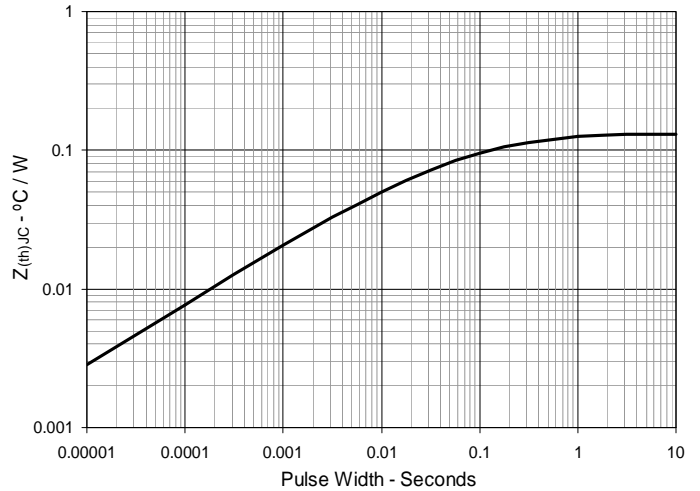
Fig. 13. Forward-Bias Safe Operating Area

@ T$_C$ = 25ºC
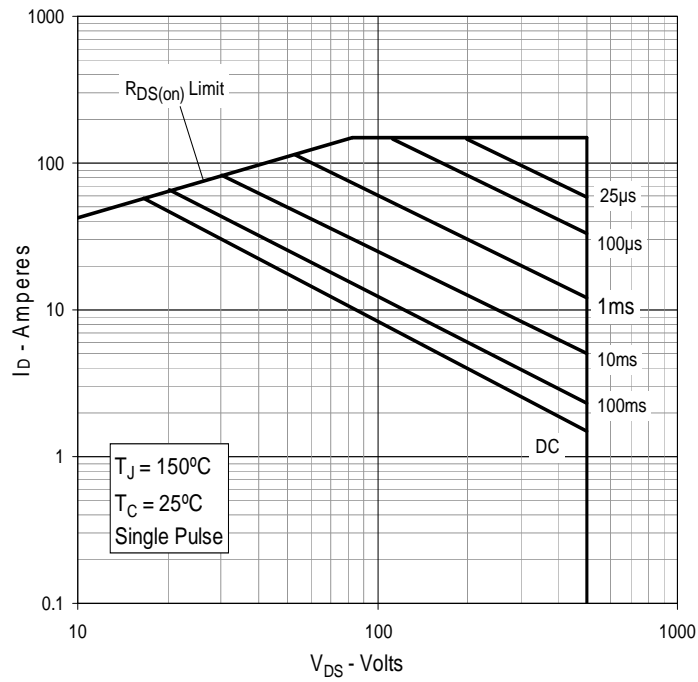
Fig. 14. Forward-Bias Safe Operating Area

@ T$_C$ = 75ºC

IXYS REF: T_60N50L2(9R)12-08-08-B
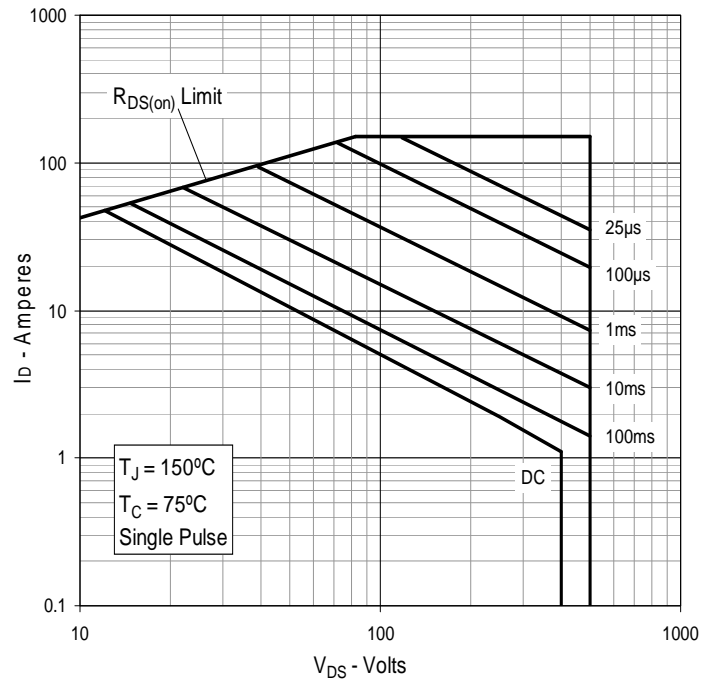
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