

CHILINK N-Channel Enhancement Mode Power MOSFET

Description

The LX30N30N1 combines advanced trench technology to provide excellent $R_{DS(ON)}$, it is tailored to minimize conduction loss, and provide superior switching performance. It can be used in a wide variety of applications.

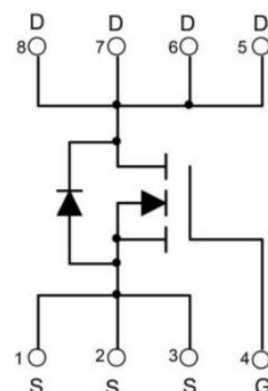
Features

- $V_{DS}=30V$, $I_D=30A$
 $R_{DS(ON)typ.} = 9.4m\Omega @ V_{GS}=10V$
 $R_{DS(ON)typ.} = 15.8m\Omega @ V_{GS}=4.5V$
- Fast Switching
- High Power and Current Handling Capability
- Termination is Lead-free and RoHS Compliant



Applications

- PWM Applications
- Load Switch
- Power Management



Schematic Diagram



PDFN3*3 Package

Maximum Ratings

($T_A = 25^\circ C$ unless otherwise noted)

PARAMETER	SYMBOL	MAX	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D(T_C=25^\circ C)$	30	A
	$I_D(T_C=100^\circ C)$	20	A
Pulsed Drain Current ^{BC}	I_{DM}	120	A
Maximum Power Dissipation ^A	P_D	20	W
Single Pulse Avalanche Energy ^D	E_{AS}	36	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristic

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance, Junction to Case	$R_{\theta JC}$	6.5	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

($T_A = 25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Gate-Threshold Voltage	V _{th(GS)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.7	2.2	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1	μA
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 10A		9.4	12.2	mΩ
		V _{GS} = 4.5V, I _D = 5A		15.8	20.5	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 5A	10			S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, F = 1MHz		670		pF
Output Capacitance	C _{oss}			180		
Reverse Transfer Capacitance	C _{rss}			75		
Switching Capacitance						
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15V, R _L = 3Ω V _{GS} = 10V, R _{GEN} = 3Ω		5		ns
Turn-On Rise Time	t _r			4		ns
Turn-Off Delay Time	t _{d(off)}			22		ns
Turn-Off Fall Time	t _f			6		ns
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 5A, V _{GS} = 4.5V		18		nC
Gate-Source Charge	Q _{gs}			3		nC
Gate-Drain Charge	Q _{gd}			5		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _D = 5A			1.2	V
Diode Forward Current	I _S				30	A

Notes:

- The Power dissipation P_D is based on $T_{J(MAX)} = 150^{\circ}\text{C}$, using $\leq 10\text{s}$ junction-to-ambient thermal resistance.
- Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^{\circ}\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J = 25^{\circ}\text{C}$.
- The Static characteristics in Figures are obtained using $< 300\mu\text{s}$ pulses, duty cycle 2% max.
- EAS condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_G = 25\Omega, L = 0.5\text{Mh}$.

Typical Electrical and Thermal Characteristics

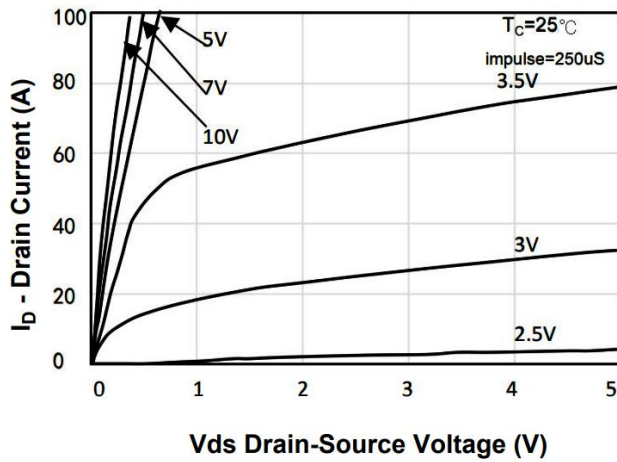


Figure 1. On-Region Characteristics

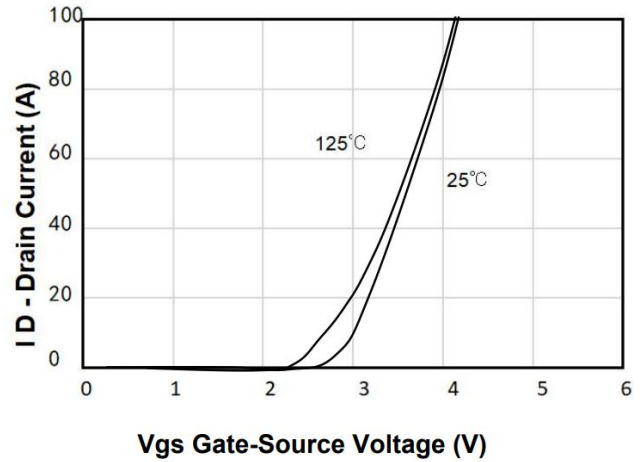


Figure 2. Transfer Characteristics

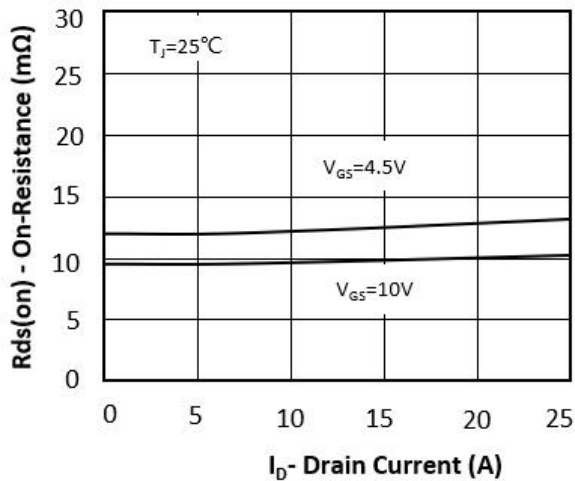


Figure 3. On-Resistance vs. Drain Current

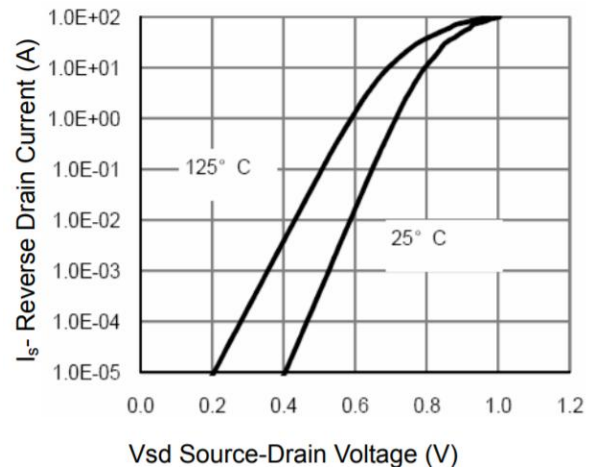


Figure 4. Body Diode Characteristics

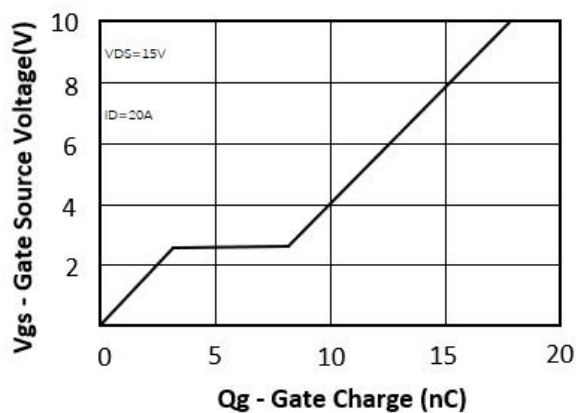


Figure 5. Gate Charge Characteristics

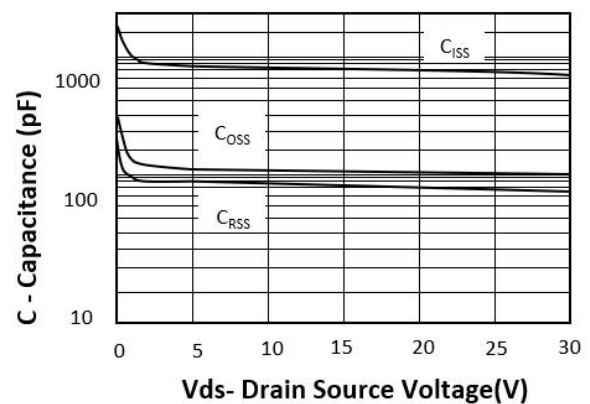


Figure 6. Capacitance Characteristics

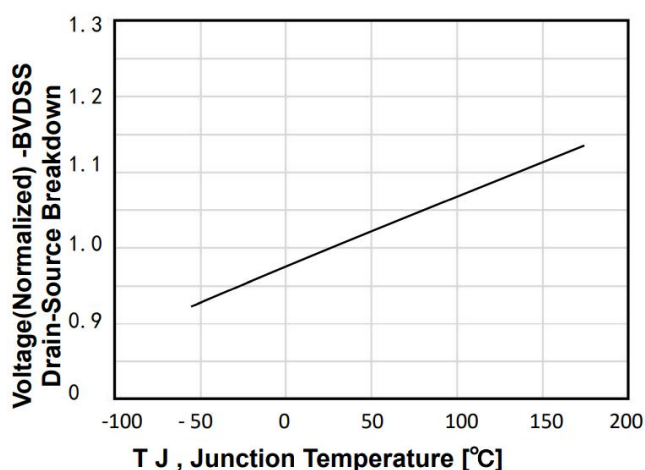


Figure 7. Breakdown Voltage Variation vs. Temperature

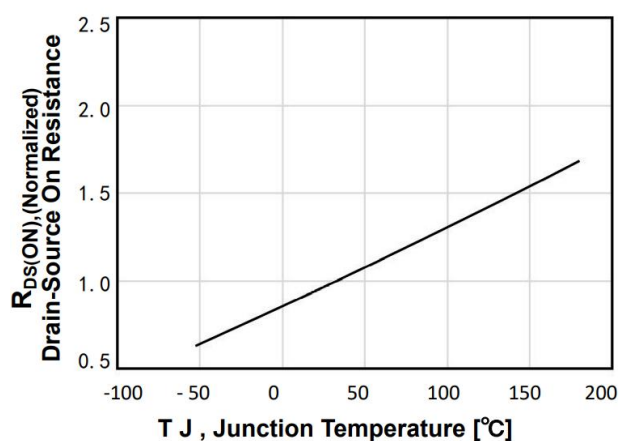


Figure 8. On-Resistance Variation vs. Temperature

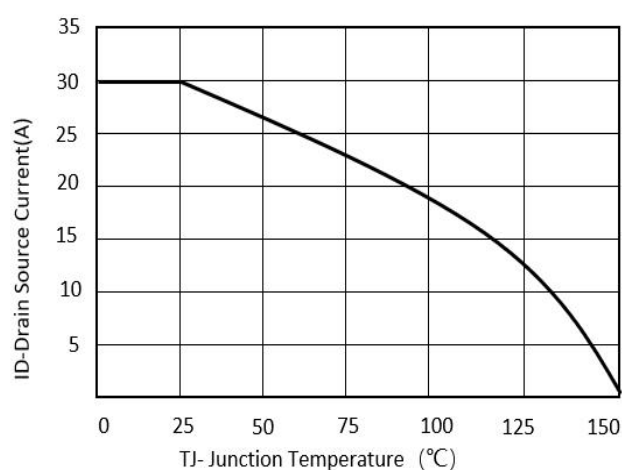


Figure 9. Current-Junction Temperature

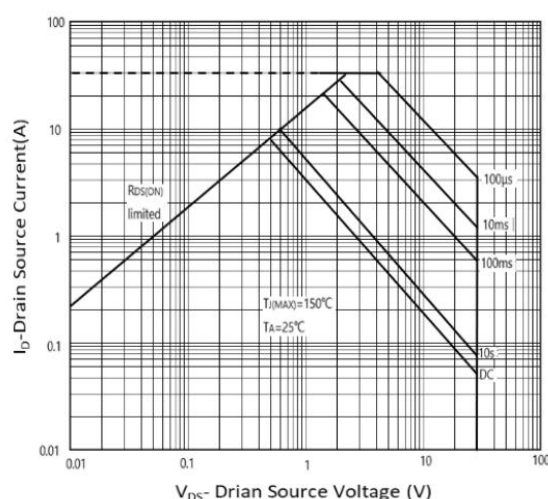


Figure 10. Safe Operation Area

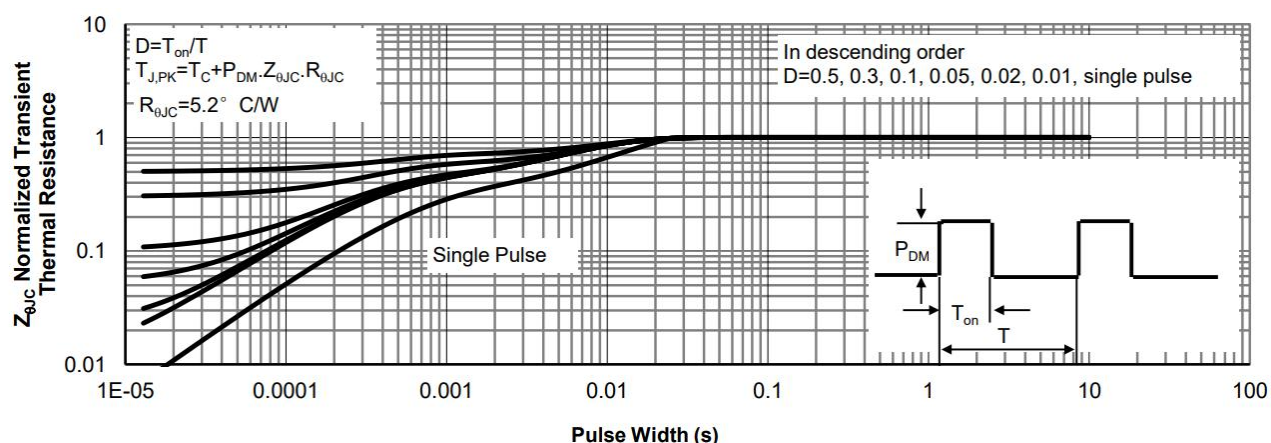


Figure 11. Normalized Maximum Transient Thermal Impedance

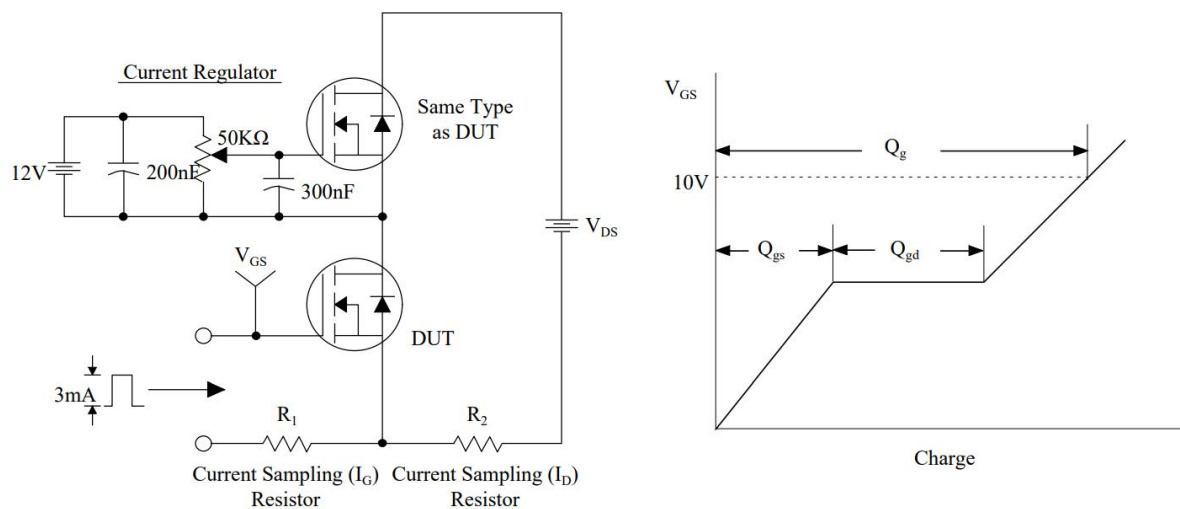


Figure 12. Gate Charge Test Circuit & Waveform

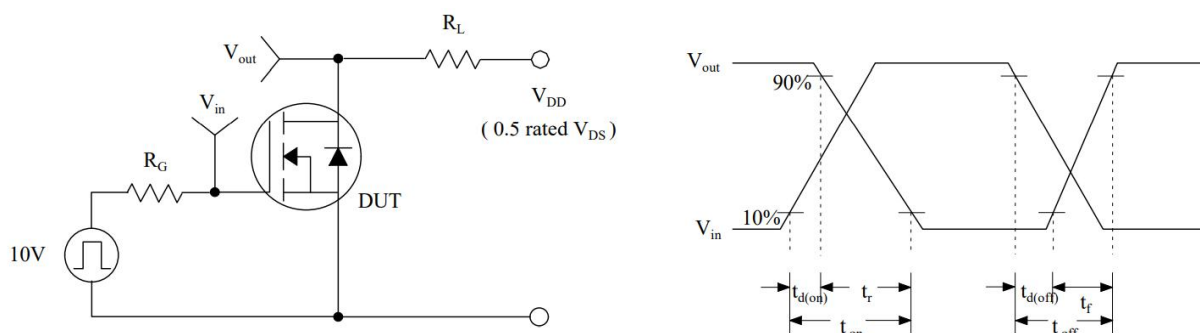


Figure 13. Resistive Switching Test Circuit & Waveforms

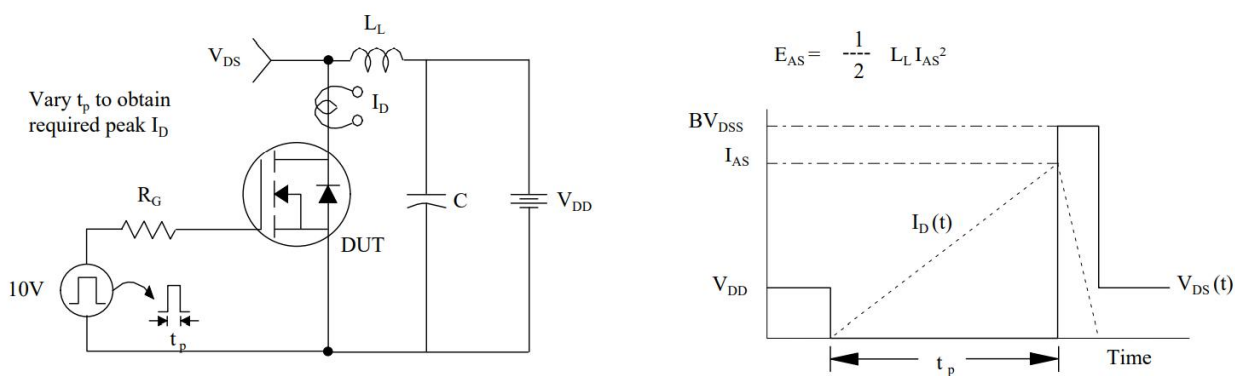
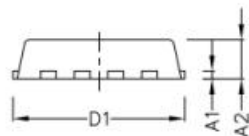
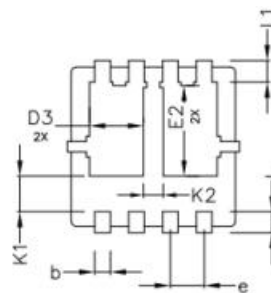


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

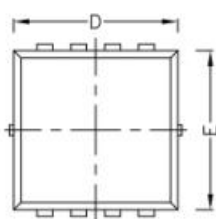
PDFN3*3 Package Information



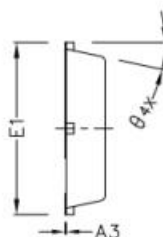
SIDE VIEW



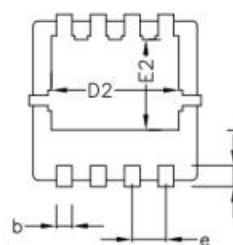
BOTTOM VIEW
OPTION 2



TOP VIEW



SIDE VIEW



BOTTOM VIEW
OPTION 1

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.152 BSC		
A2	0.650	0.750	0.850
A3	0.005	—	0.020
b	0.250	0.300	0.350
D	3.050	3.150	3.250
D1	3.200	3.300	3.400
D2	2.350	2.450	2.550
D3	0.935	1.035	1.135
E1	3.150	3.300	3.450
E	2.950	3.050	3.150
E2	1.635	1.735	1.835
e	0.650 TYPE		
L	0.300	0.400	0.500
θ	12° TYPE		
K1	0.680 REF		
K2	0.380 REF		
L1	0.410 REF		

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