

CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

The LX3400BL combines advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltage as low as 2.5V. This device is suitable for use as a load switch or PWM applications.

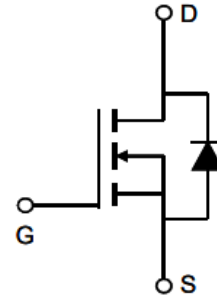
Features

- $V_{DS}=30V$, $I_D=5.8A$
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=10V$
 $R_{DS(ON)} < 31m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 45m\Omega @ V_{GS}=2.5V$
- Low gate charge
- High power and current handling capability
- Termination is Lead-free and RoHS Compliant

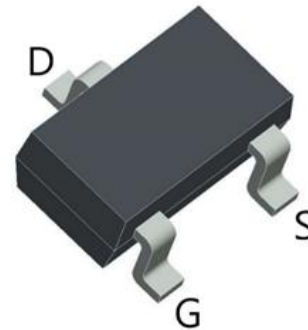


Applications

- PWM applications
- Load switch
- Power Management



Schematic Diagram



SOT23-3L Package

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	5.8	A
Pulsed Drain Current ^B	I_{DM}	23	A
Maximum Power Dissipation ^A	P_D	1.3	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction to Ambient	R_{QJA}	96	$^\circ C/W$
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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 =250uA	30			V
Gate-Threshold Voltage	V _{th(GS)}	V _{DS} = V _{GS} , I _D =250 uA	0.6	0.8	1.2	V
Gate-body Leakage	IGSS	V _{DS} =0V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	IDSS	V _{DS} =30V, V _{GS} =0V			1	uA
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5A		21	25	mΩ
		V _{GS} =4.5V, I _D =4A		23	31	mΩ
		V _{GS} =2.5V, I _D =3A		30	45	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		635		pF
Output Capacitance	C _{oss}			56		
Reverse Transfer Capacitance	C _{rss}			46		
Switching Capacitance						
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, R _L =2.7Ω V _{GS} = 10V, R _{GEN} =3Ω		3.3		nS
Turn-on Rise Time	t _r			4.8		nS
Turn-off Delay Time	t _{d(off)}			26		nS
Turn-off Fall Time	t _f			4		nS
Total Gate Charge	Q _g	V _{DS} = 15V, I _D =5A, V _{GS} =4.5V		5.2		nC
Gate-Source Charge	Q _{gs}			1.2		nC
Gate-Drain Charge	Q _{gd}			1.7		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _D =5A			1.2	V
Diode Forward Current	I _s				5.8	A

Notes:

- The Power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using $\leq 10s$ 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 $<300\mu s$ pulses, duty cycle 2% max.

Typical Electrical and Thermal Characteristics

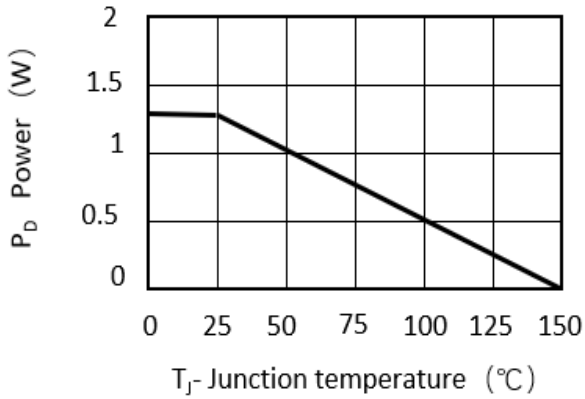


Figure 1: Power Dissipation

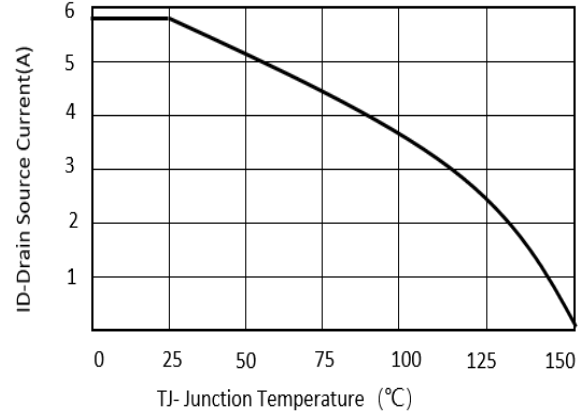


Figure 2: Drain Current

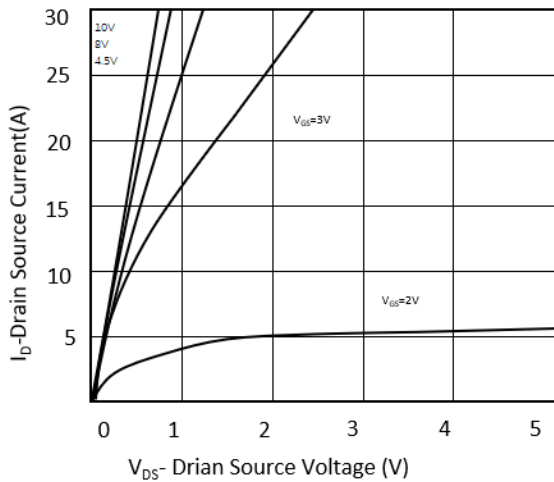


Figure 3: On-region Characteristic

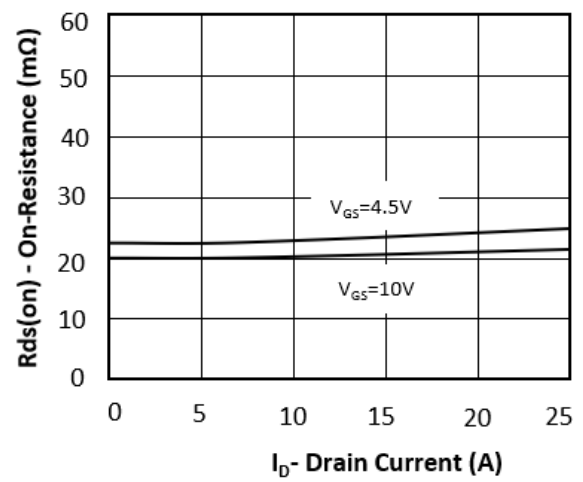


Figure 4: Drain-Source On-Resistance

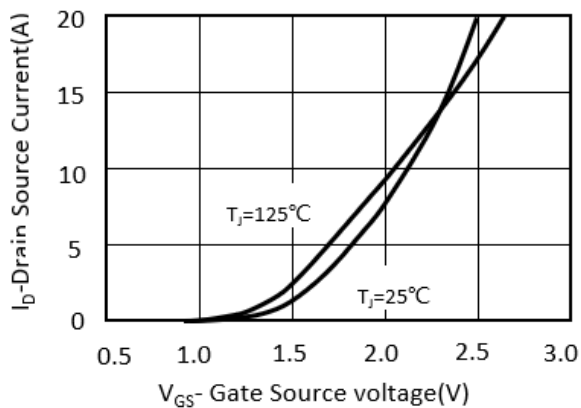


Figure 5: Transfer Characteristics

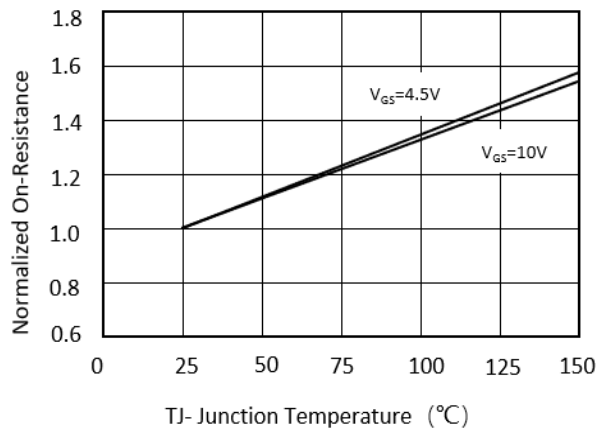


Figure 6: On-resistance VS. Junction Temperature

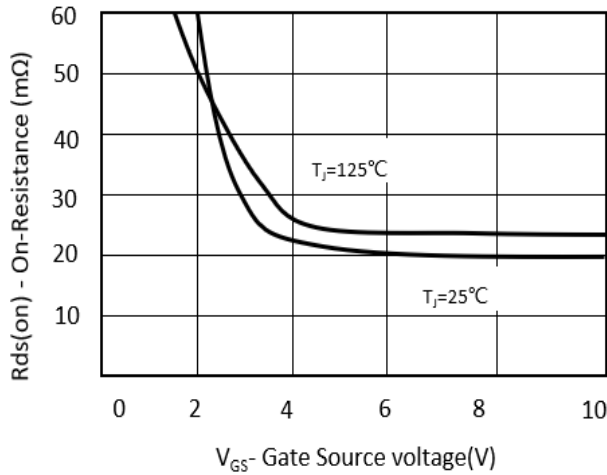


Figure 7: On-Resistance Vs. Gate Source Voltage

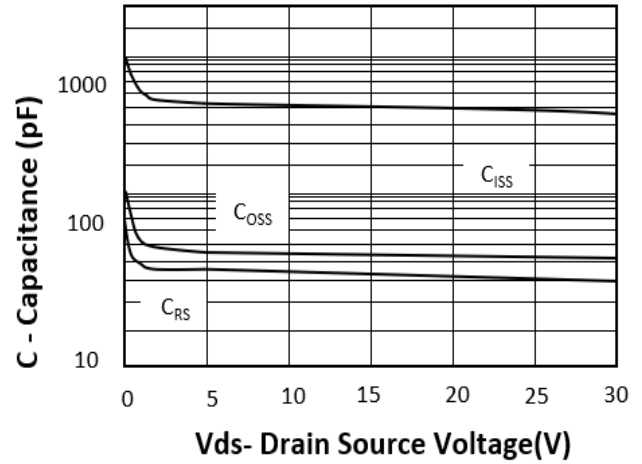


Figure 8: Capacitance Vs. Drain Source Voltage

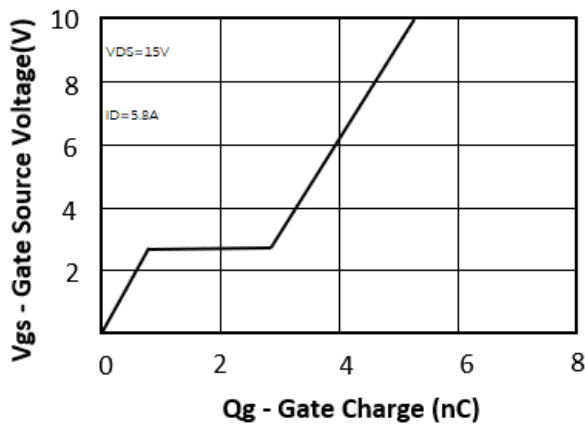


Figure 9: Gate Charge

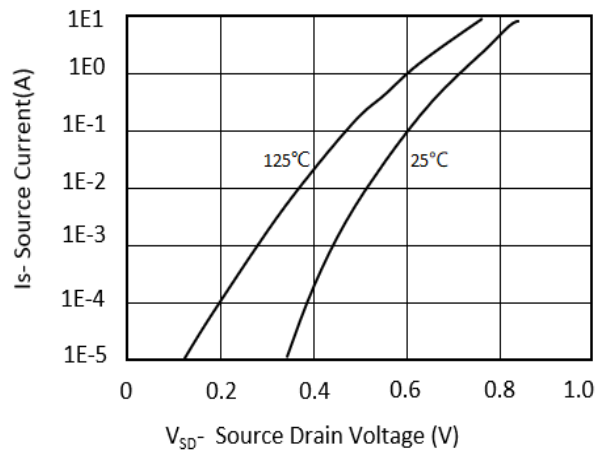


Figure 10: Source-Drain Diode Forward

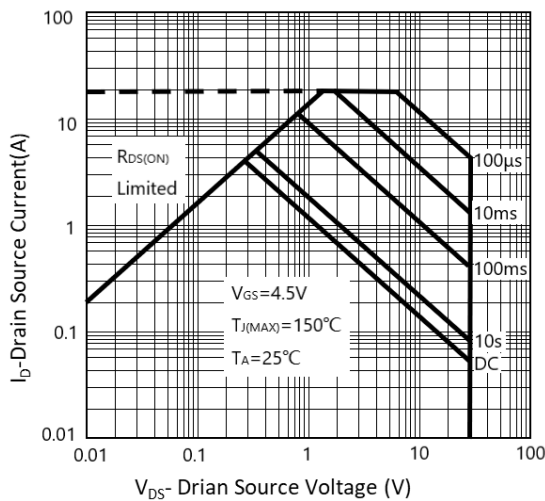


Figure 11: Safe Operation Area

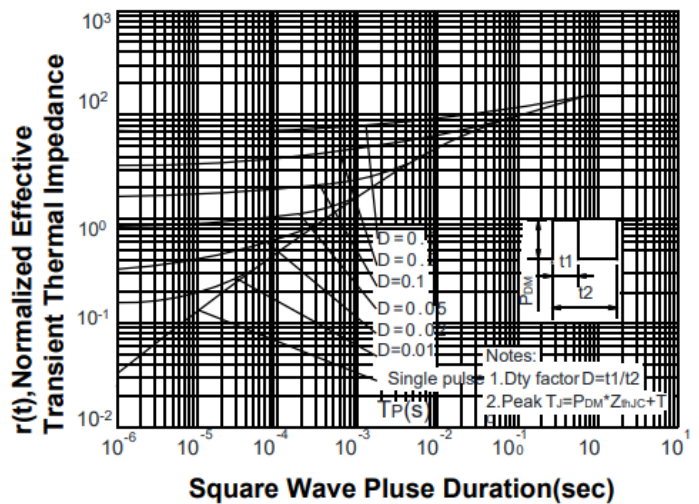
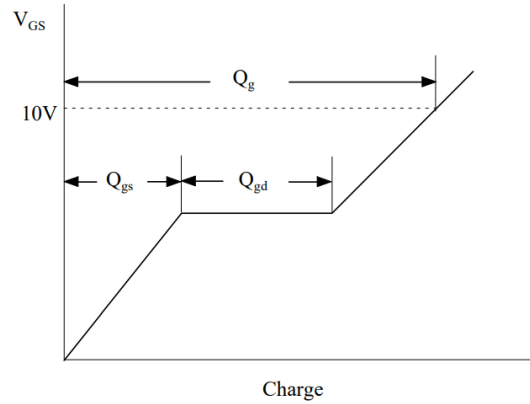
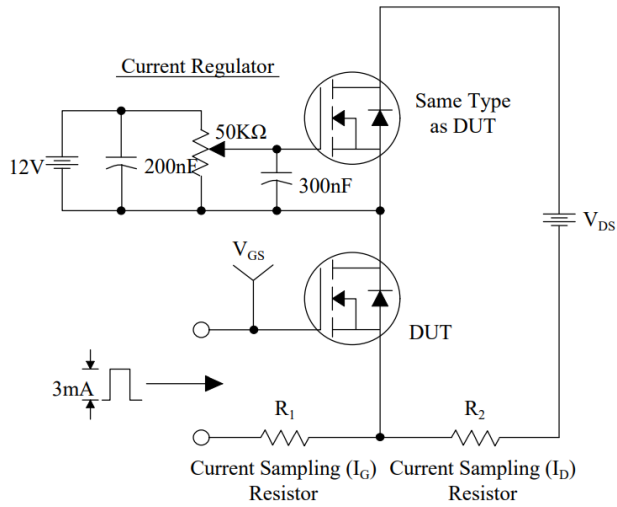
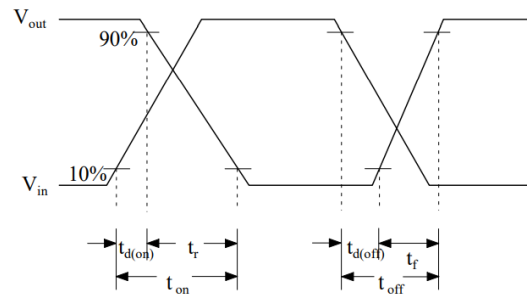
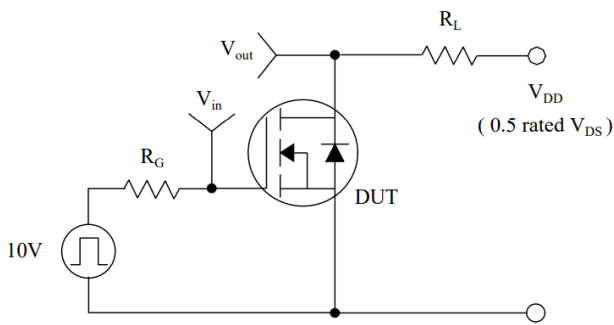


Figure 12: Transient Thermal Response Curve

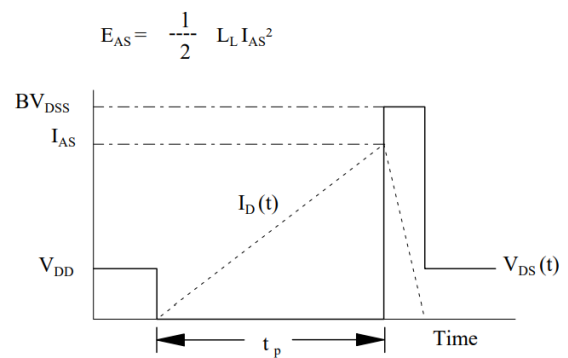
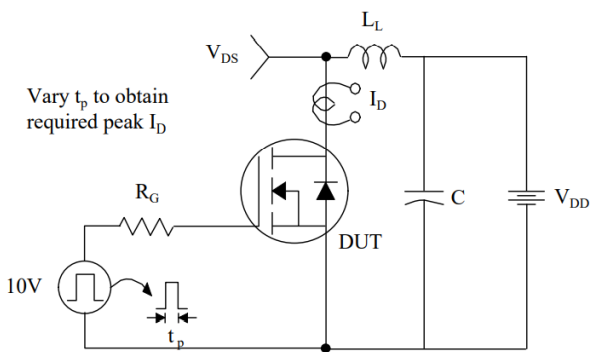
Gate Charge Test Circuit & Waveform

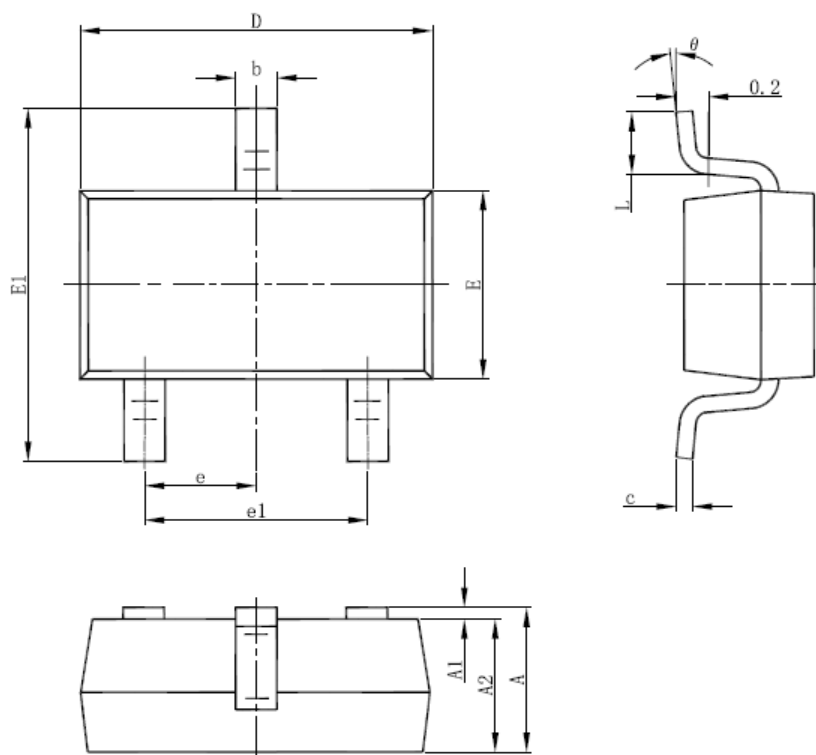


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



SOT23-3L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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