

CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

The LX3400L 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.

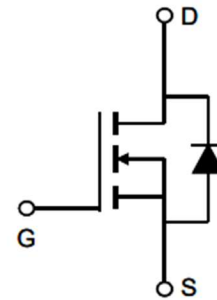
Features

- $V_{DS}=30V$, $I_D=5.1A$
 $R_{DS(ON)} < 33m\Omega @ V_{DS}=10V$
 $R_{DS(ON)} < 39m\Omega @ V_{DS}=4.5V$
 $R_{DS(ON)} < 55m\Omega @ V_{DS}=2.5V$
- Low gate charge
- High power and current handling capability
- Termination is Lead-free and RoHS Compliant

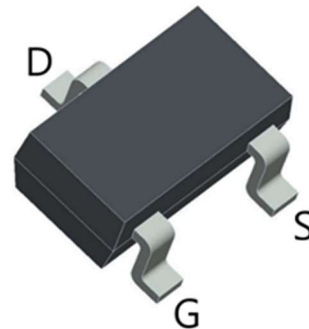


Applications

- 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	5.1	A
Pulsed Drain Current ^B	I_{DM}	20	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}	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate-Threshold Voltage	$V_{th(GS)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.7	0.9	1.2	V
Gate-body Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5A$		24	33	m Ω
		$V_{GS}=4.5V, I_D=4A$		26	39	m Ω
		$V_{GS}=2.5V, I_D=3A$		33	55	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5A$	10			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=15V, V_{GS}=0V, F=1MHz$		595		μF
Output Capacitance	C_{OSS}			39		
Reverse Transfer Capacitance	C_{RSS}			36		
Switching Capacitance						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V, R_L=3\Omega, V_{GS}=10V, R_{GEN}=3\Omega$		3.0		nS
Turn-on Rise Time	t_r			4.5		nS
Turn-off Delay Time	$t_{d(off)}$			25		nS
Turn-off Fall Time	t_f			3.8		nS
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=5A, V_{GS}=4.5V$		9.3		nC
Gate-Source Charge	Q_{gs}			1.6		nC
Gate-Drain Charge	Q_{gd}			2.1		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_D=5A$			1.2	V
Diode Forward Current	I_S				5.1	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

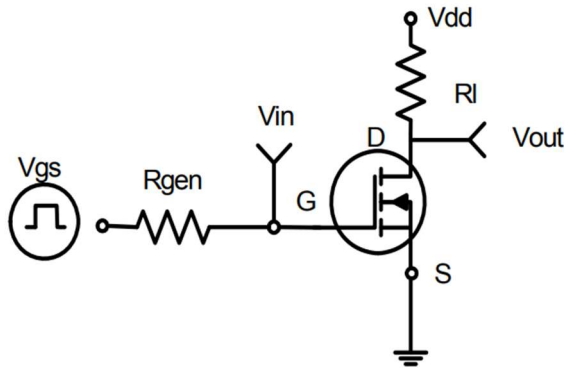


Figure 1: Switching Test Circuit

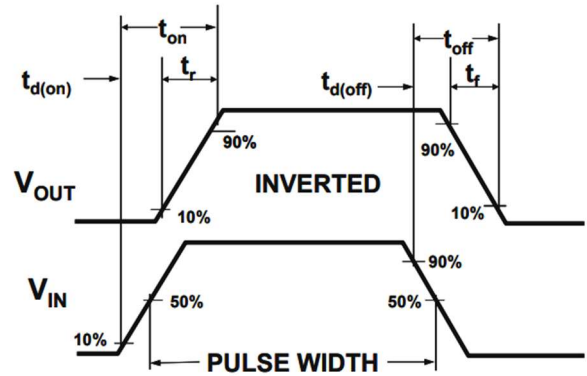
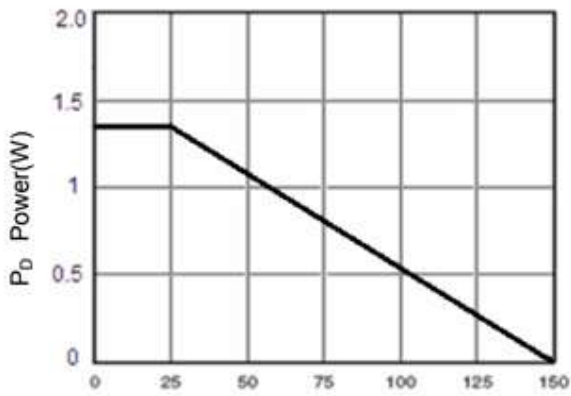
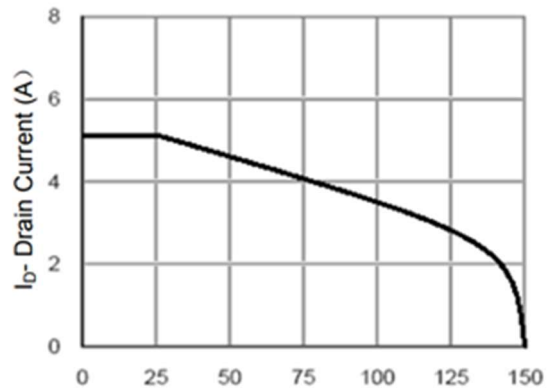


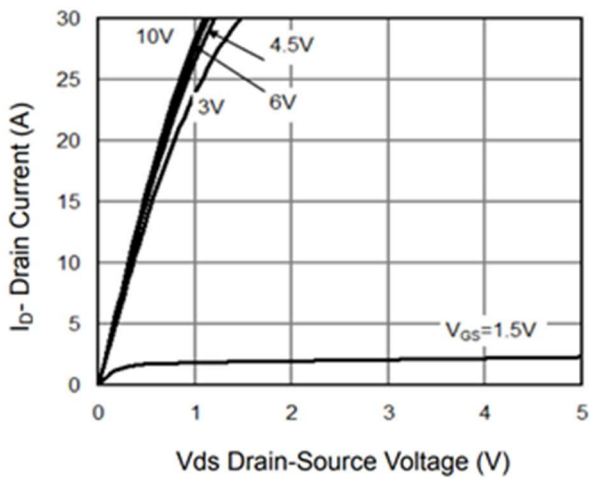
Figure 2: Switching Waveforms



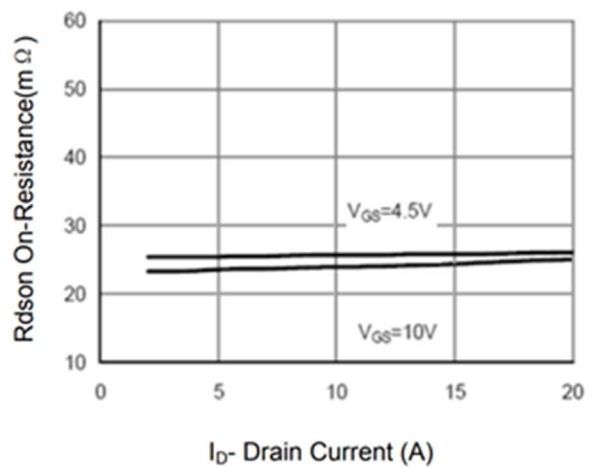
T_J-Junction Temperature(°C)
Figure 3 Power Dissipation



T_J-Junction Temperature(°C)
Figure 4 Drain Current



V_{DS} Drain-Source Voltage (V)
Figure 5 Output Characteristics



I_D- Drain Current (A)
Figure 6 Drain-Source On-Resistance

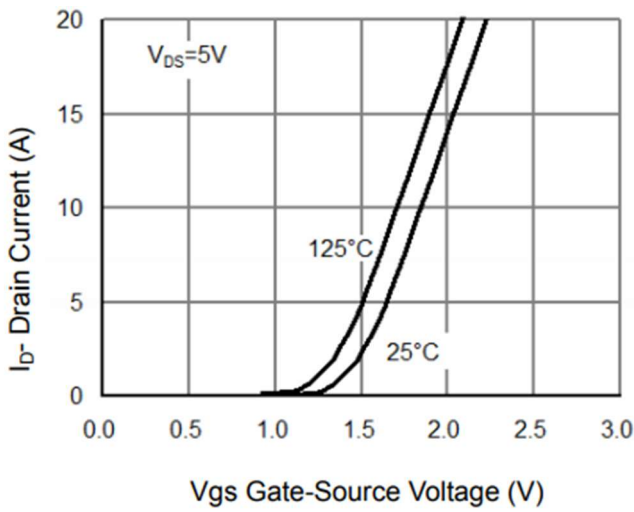


Figure 7 Transfer Characteristics

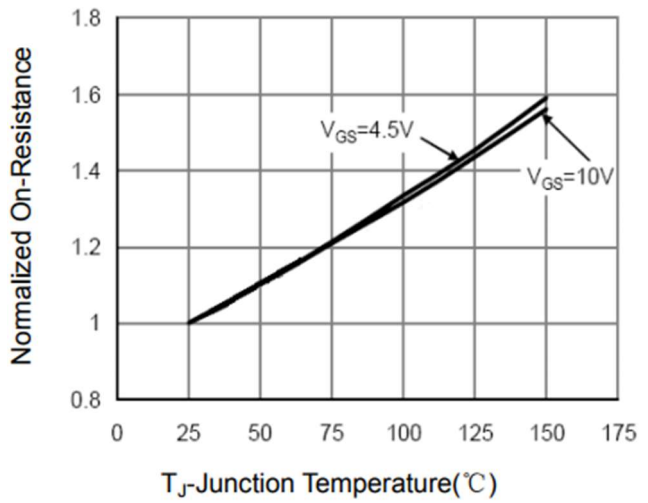


Figure 8 Drain-Source On-Resistance

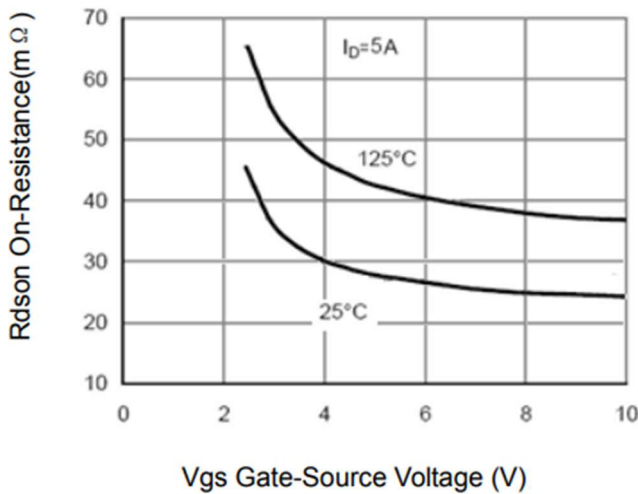


Figure 9 Rdson vs Vgs

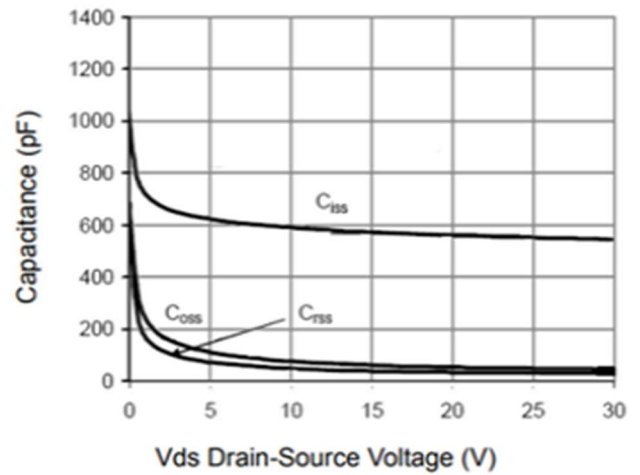


Figure 10 Capacitance vs Vds

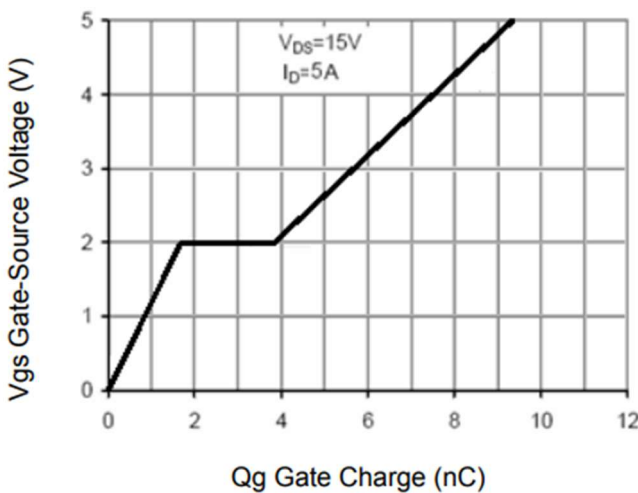


Figure 11 Gate Charge

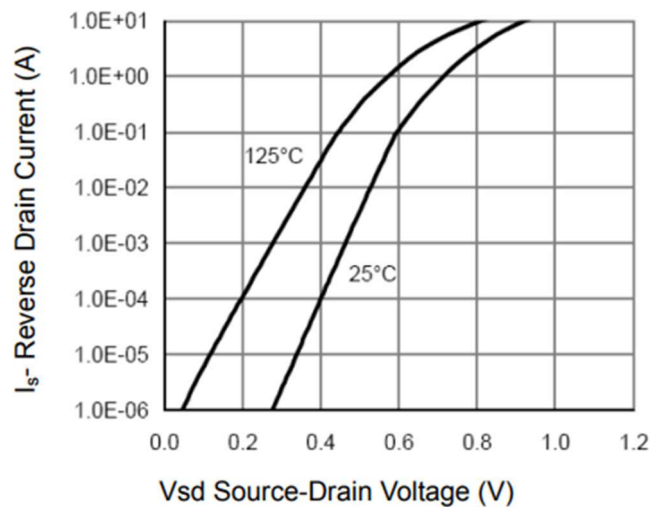


Figure 12 Source-Drain Diode Forward

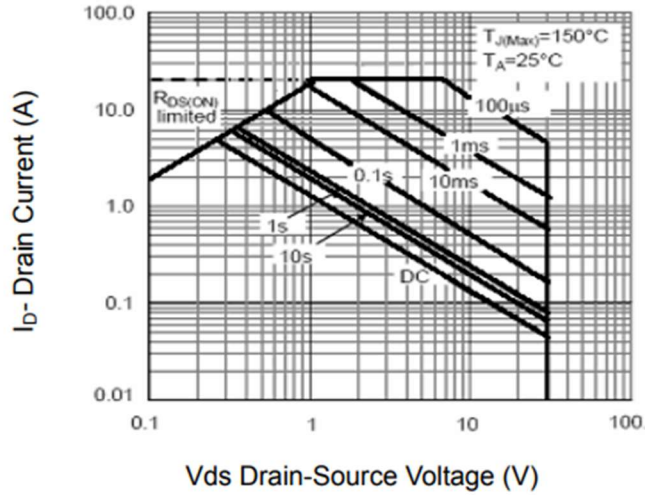


Figure 13 Safe Operation Area

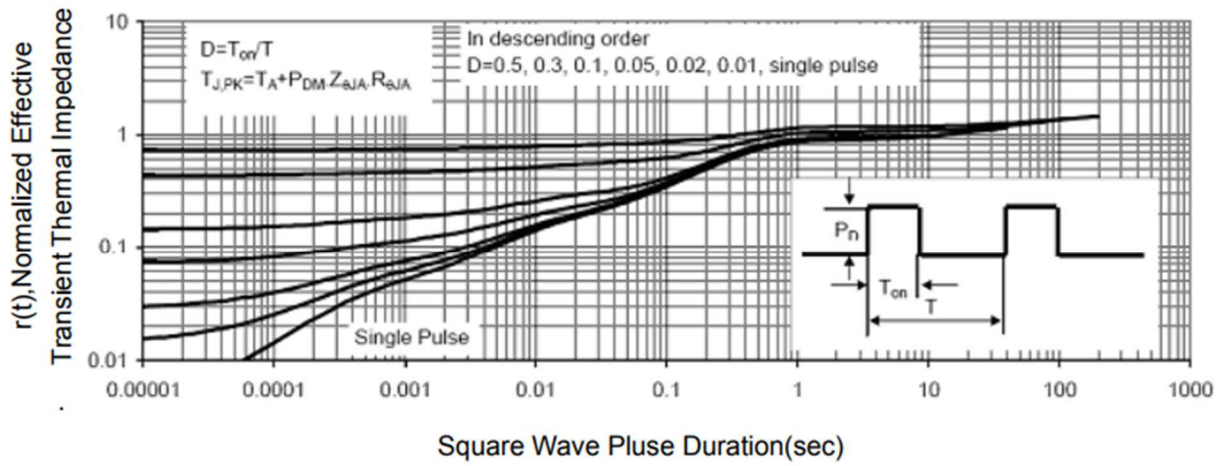
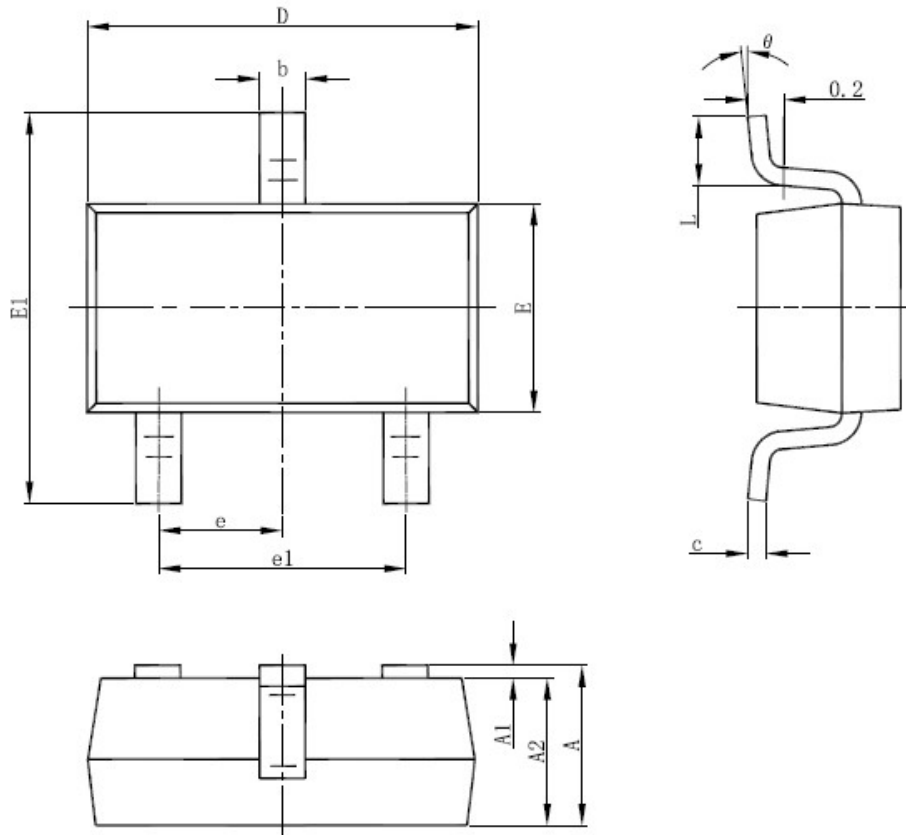


Figure 14 Normalized Maximum Transient Thermal Impedance

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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