

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.

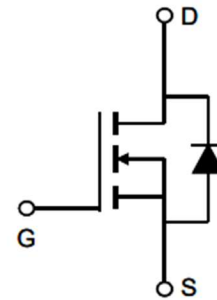
Features

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

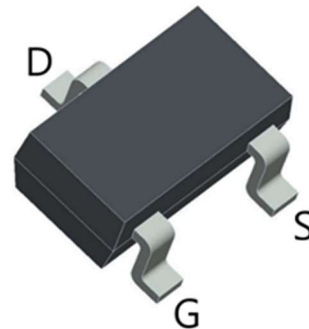


Applications

- 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	$^\circ C/W$
---	-----------	----	--------------

Electrical Characteristics (T_A=25°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	0.7	0.9	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		24	33	mΩ
		V _{GS} =4.5V, I _D =4A		26	39	mΩ
		V _{GS} =2.5V, I _D =3A		33	55	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		595		pF
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 =3Ω V _{GS} = 10V, R _{GEN} =3Ω		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 °C , using ≤10s junction-to ambient thermal resistance.
- Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C .Ratings are based on low frequency and duty cycles to keep initial T_J=25°C .
- The Static characteristics in Figures are obtained using <300 μ s pulses, duty cycle 2% max.

Typical Electrical and Thermal Characteristics

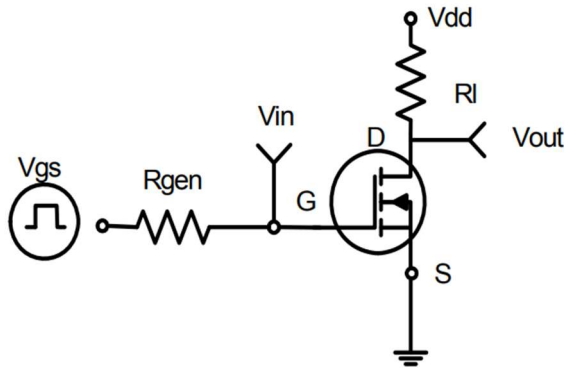


Figure 1: Switching Test Circuit

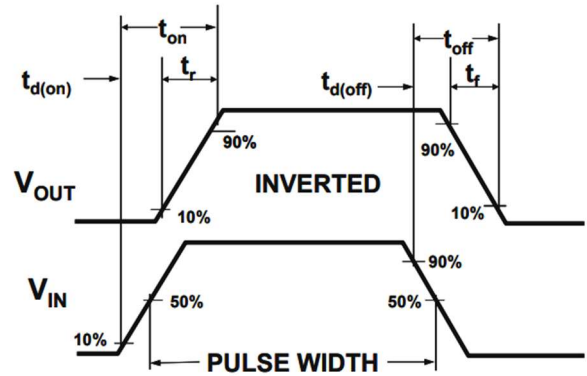
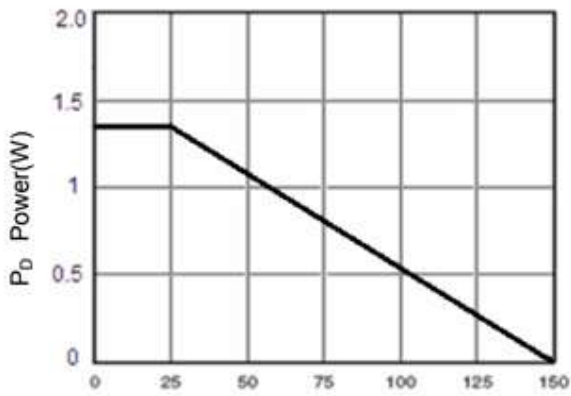
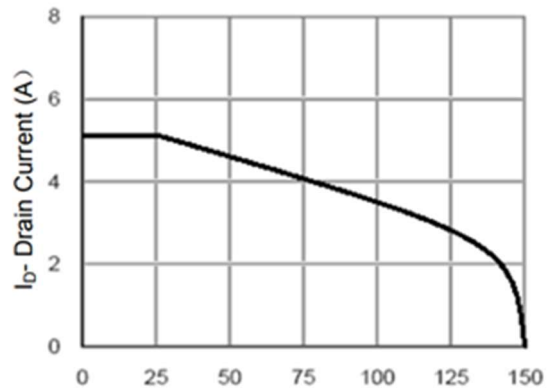


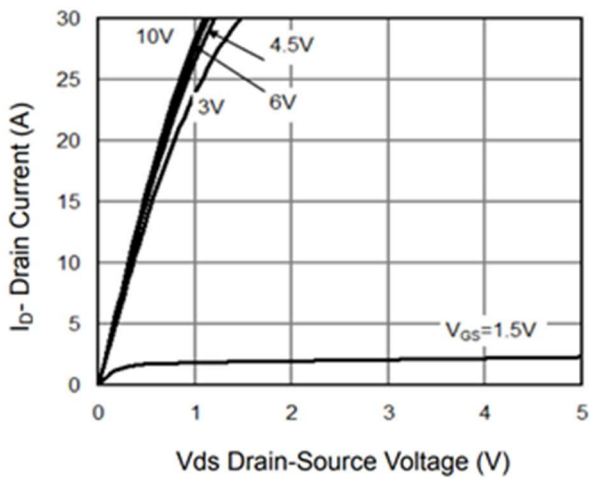
Figure 2: Switching Waveforms



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

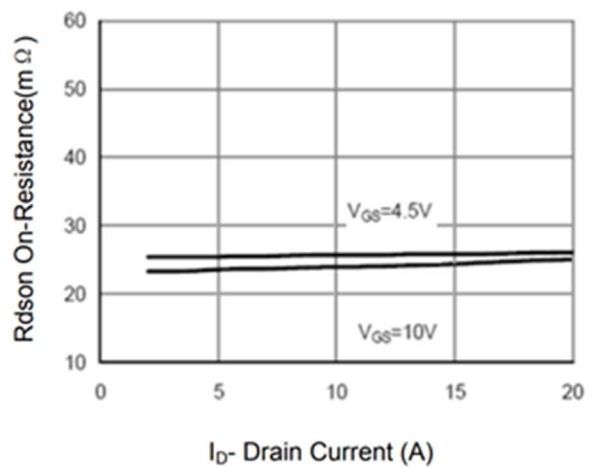


Figure 6 Drain-Source On-Resistance

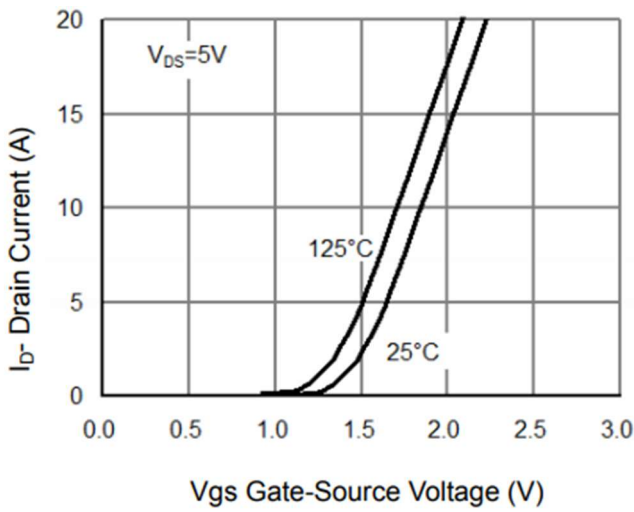


Figure 7 Transfer Characteristics

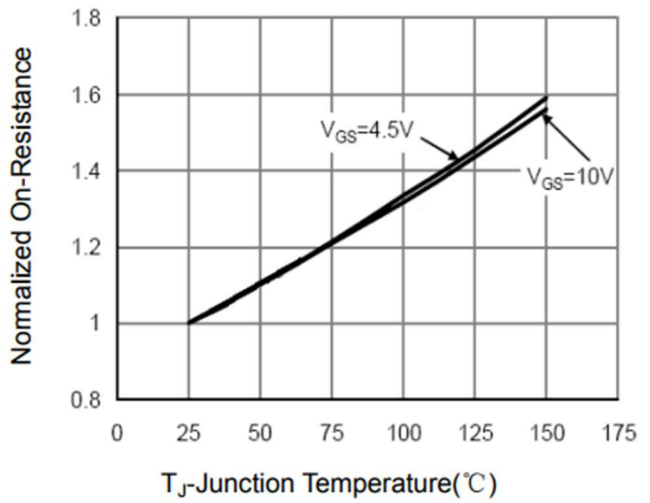


Figure 8 Drain-Source On-Resistance

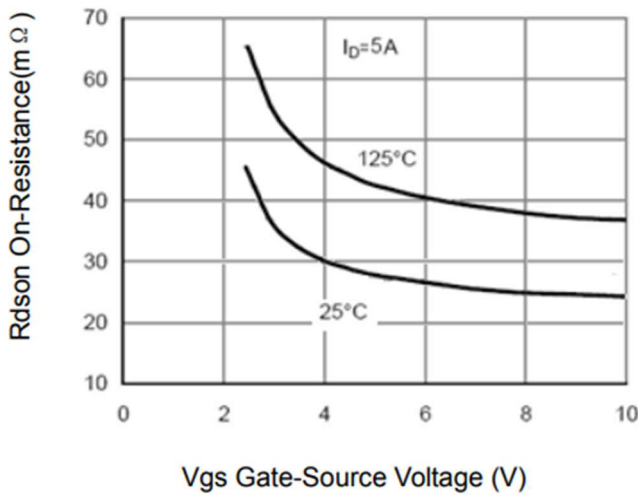


Figure 9 Rdson vs Vgs

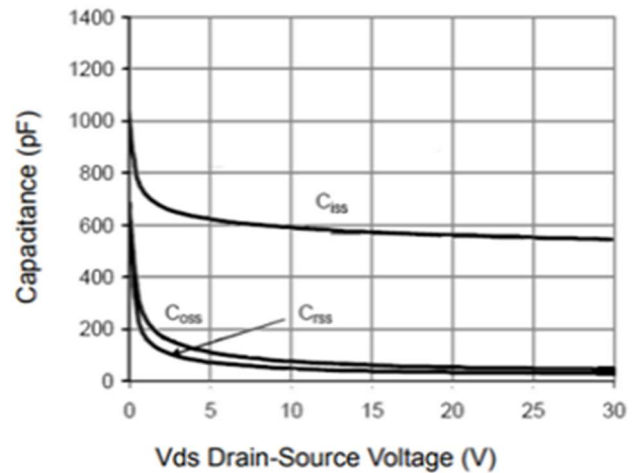


Figure 10 Capacitance vs Vds

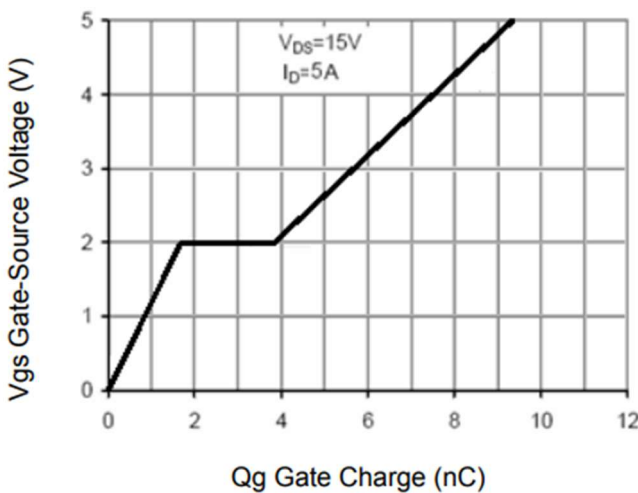


Figure 11 Gate Charge

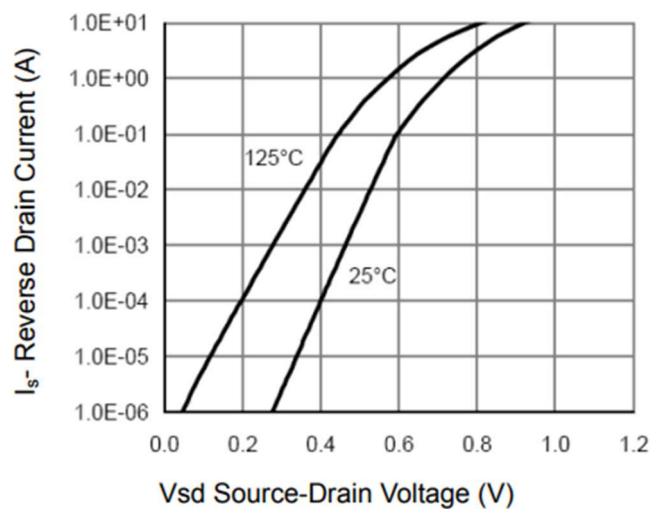


Figure 12 Source- Drain Diode Forward

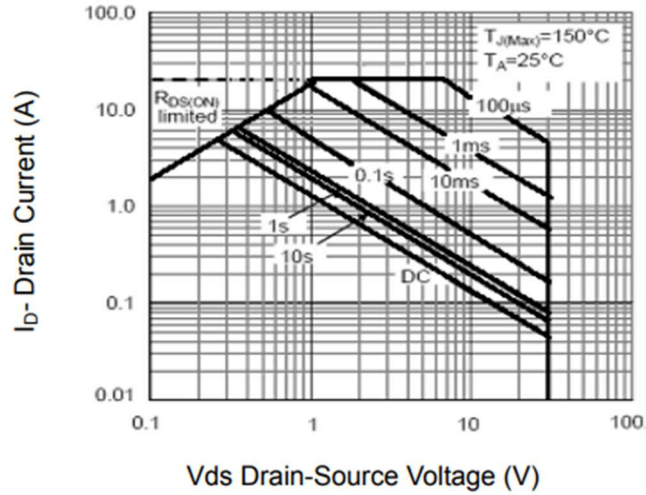


Figure 13 Safe Operation Area

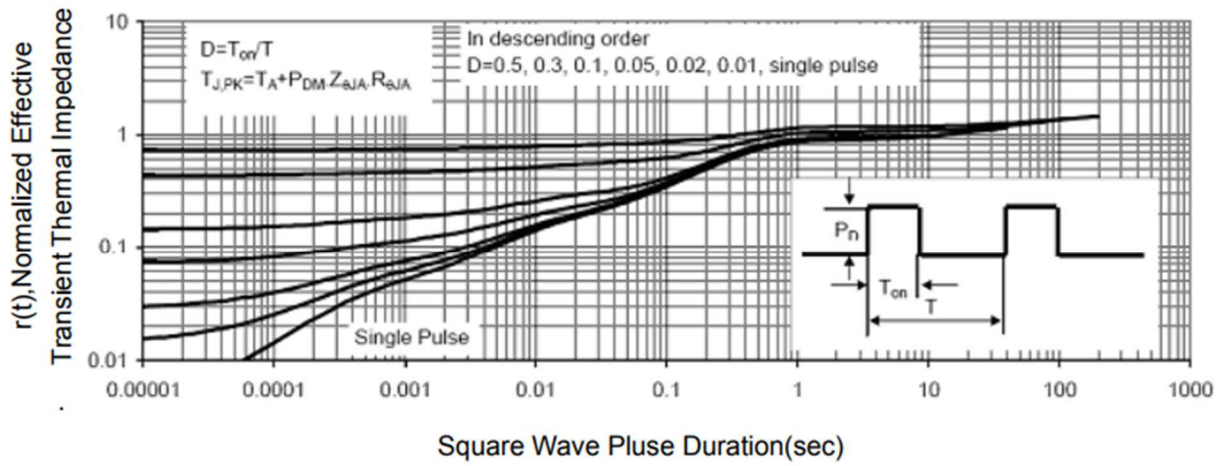
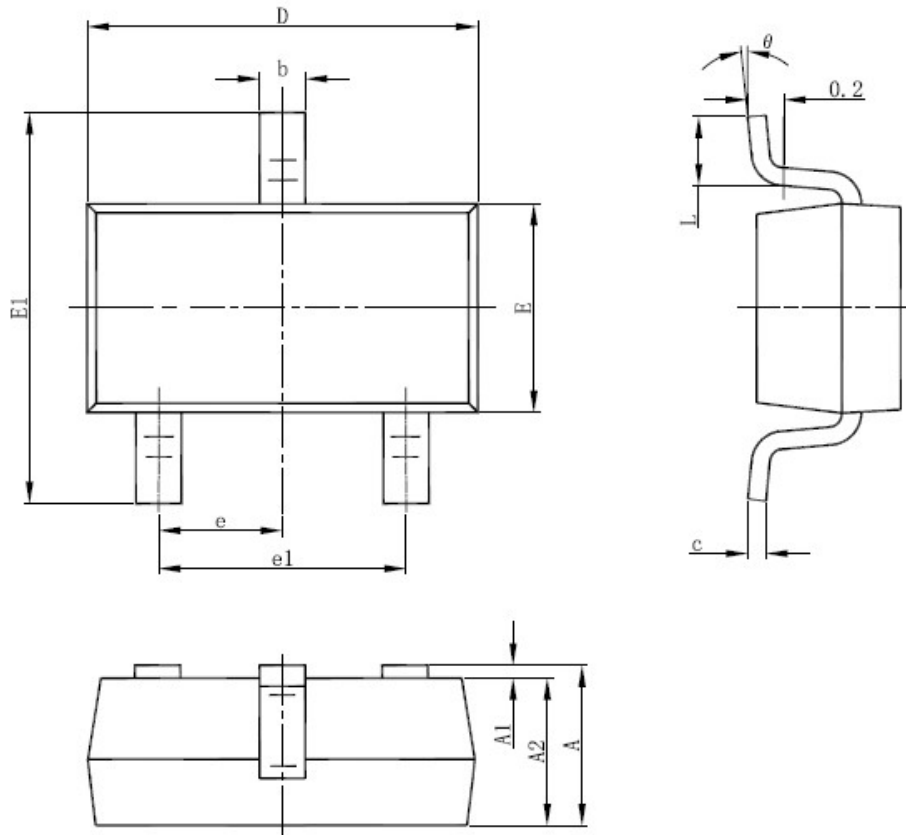


Figure 14 Normalized Maximum Transient Thermal Impedance

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°

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED.

CHIPLINK DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS.

THIS DOCUMENT SUPERSEDES AND REPLACES ALL INFORMATION PREVIOUSLY SUPPLIED. CHIPLINK RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.