CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

The LX3404S combines advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or PWM applications.

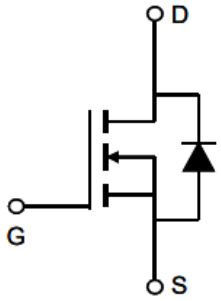
Features

- V_{DS}=30V, I_D=5.8A
  $R_{DS(ON)typ.}$ =19mΩ@V_{GS}=10V
  $R_{DS(ON)typ.}$=26mΩ@V_{GS}=4.5V
- Low gate charge
- High power and current handing capability
- Termination is Lead-free and RoHS Compliant

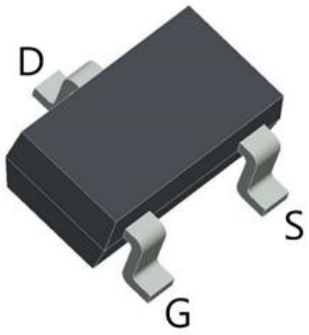
RoHS COMPLIANT

Applications

- PWM applications
- Load switch
- Power Management



Schematic Diagram



SOT23 Package

Maximum Ratings(T_A=25℃ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	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	℃

Thermal Characteristic

Thermal Resistance, Junction to Ambient	R_{QJA}	89	℃/W

Electrical Characteristics (T_A=25℃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	1.2	1.6	2.2	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		19	25	mΩ
		V_{GS} =4.5V, I_D =4A		26	35	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	Is				5.8	A

Notes:

A. The Power dissipation P_D is based on $T_{J(MAX)}$=150℃, using≤10s junction-to ambient thermal resistance.

B. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃.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 μs pulses, duty cycle 2% max.

Typical Electrical and Thermal Characteristics

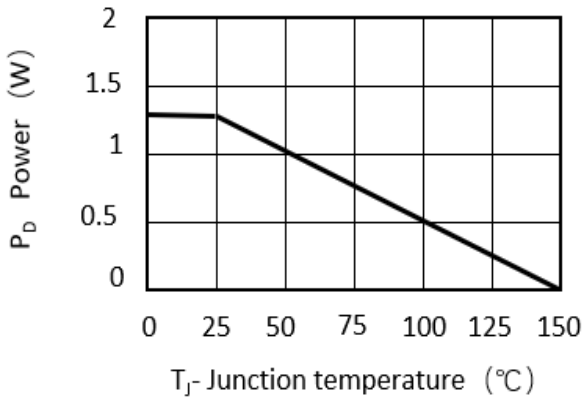


Figure 1: Power Dissipation

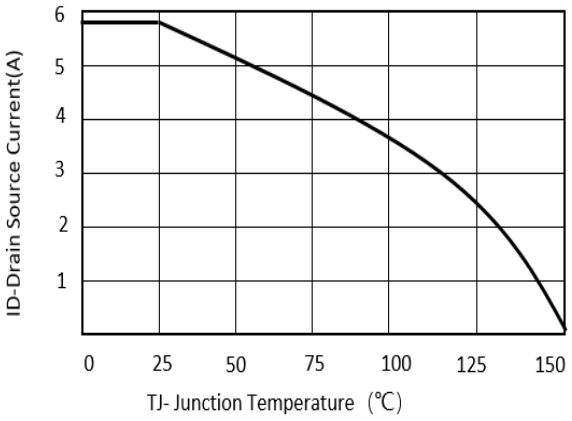


Figure 2: Drain Current

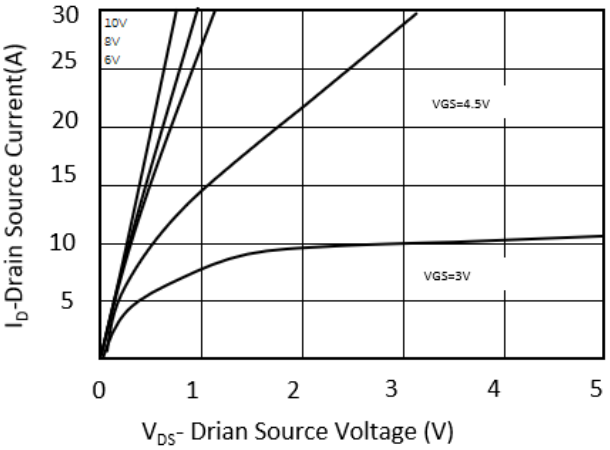


Figure 3: On-region Characteristic

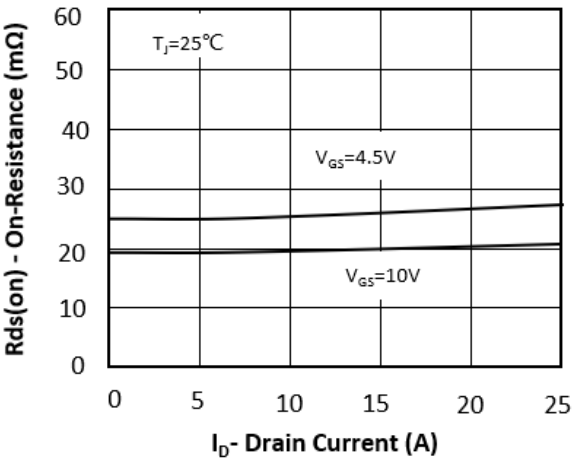


Figure 4: Drain-Source On-Resistance

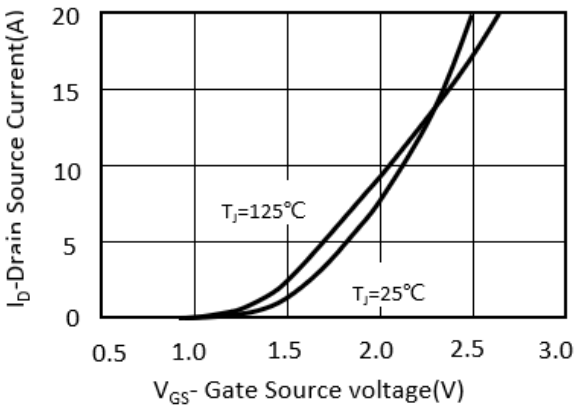


Figure 5: Transfer Characteristics

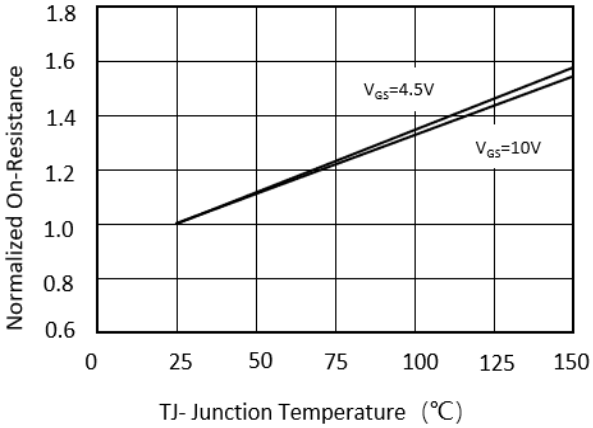


Figure 6: On-resistance VS. Junction Temperature

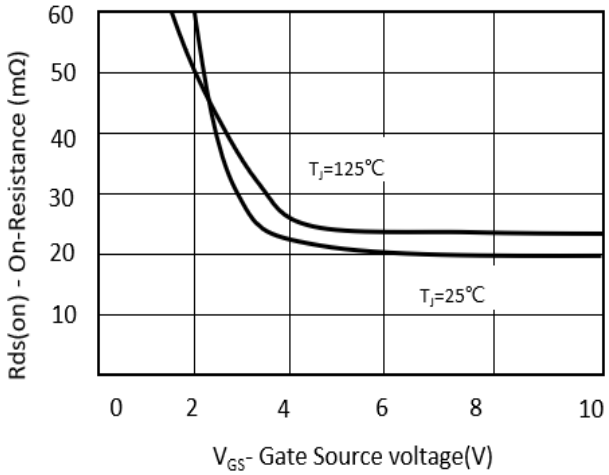


Figure 7: On-Resistance Vs. Gate Source Voltage

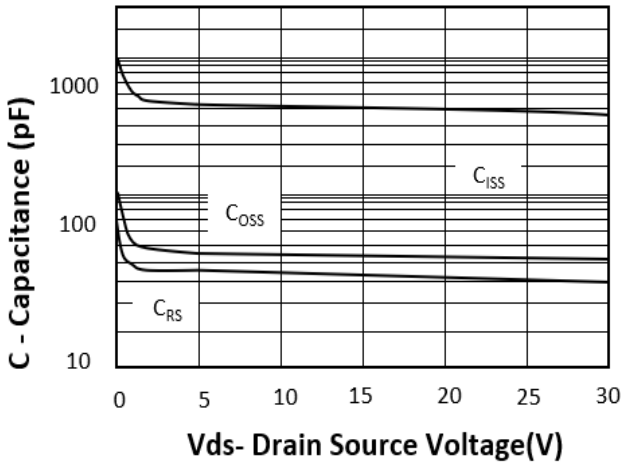


Figure 8: Capacitance Vs. Drain Source Voltage

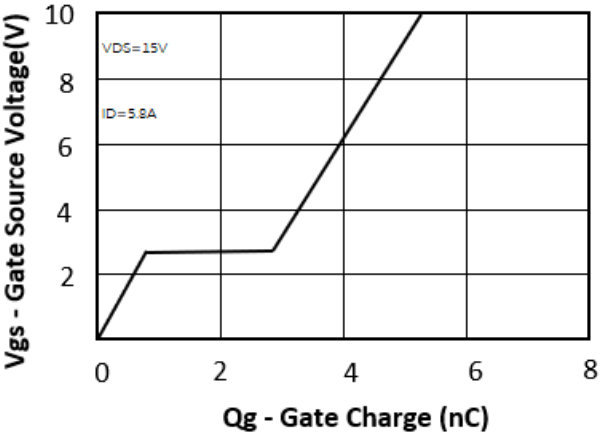


Figure 9: Gate Charge

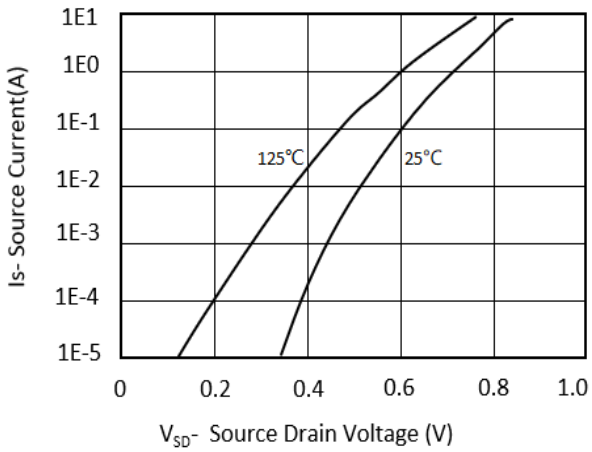


Figure 10: Source-Drain Diode Forward

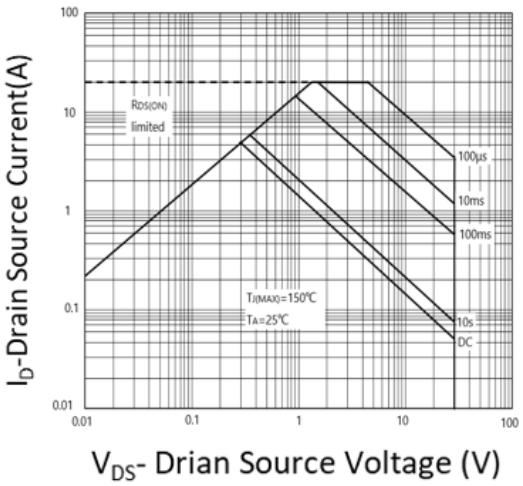


Figure 11: Safe Operation Area

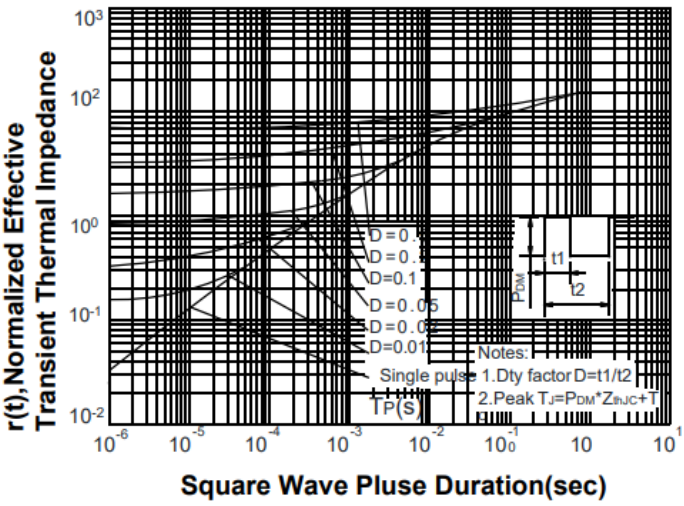
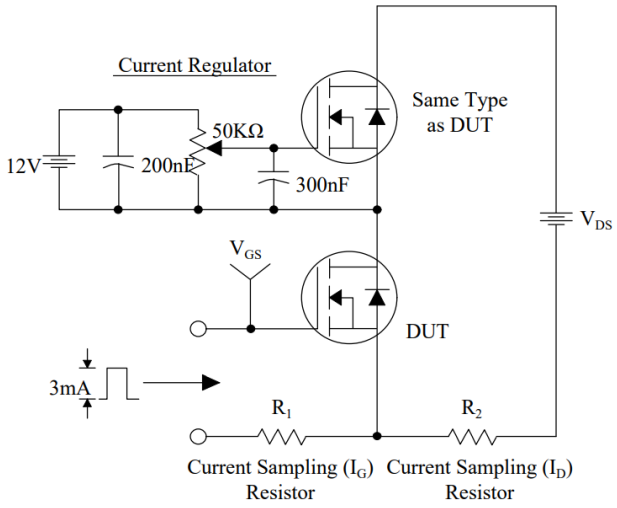
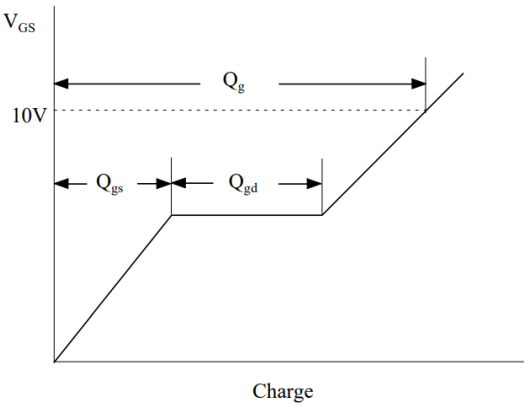


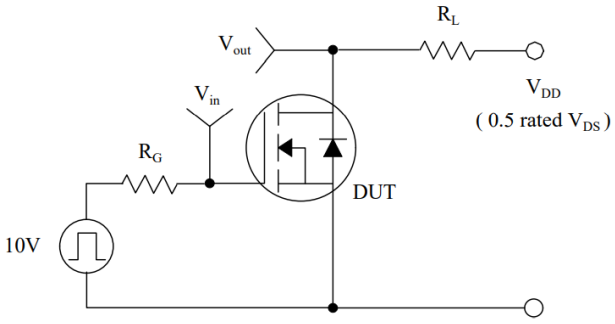
Figure 12: Transient Thermal Response Curve

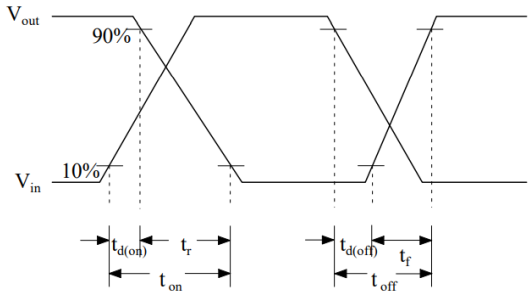
Gate Charge Test Circuit & Waveform



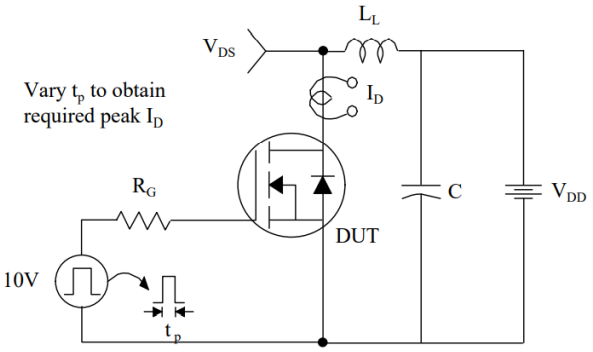


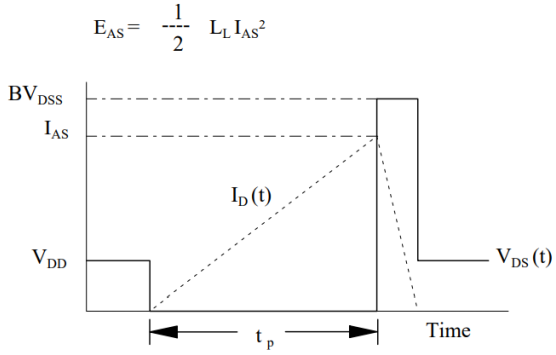
Resistive Switching Test Circuit & Waveforms



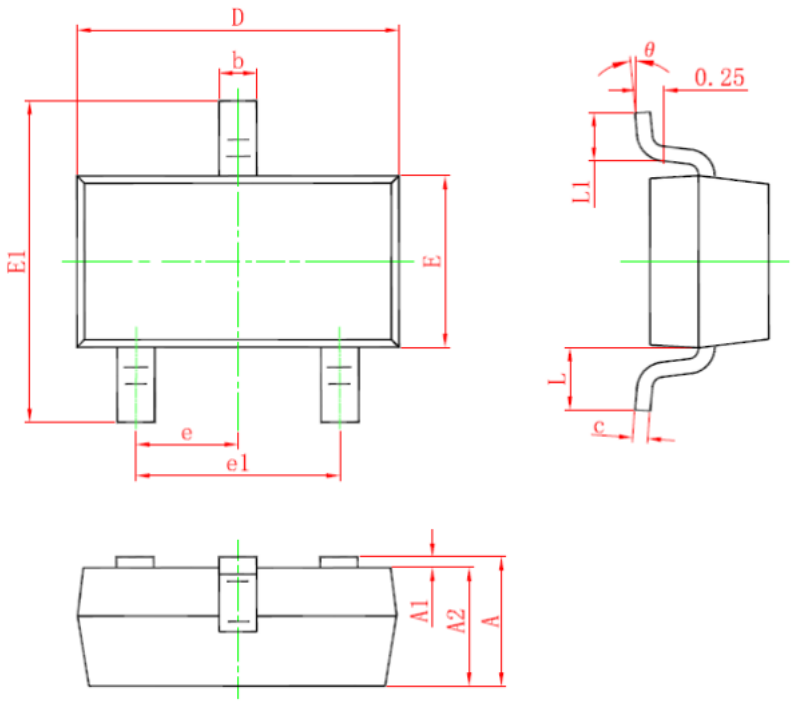


Unclamped Inductive Switching Test Circuit & Waveforms





SOT23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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