

CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

The LX2302S combines advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch or PWM applications.

Features

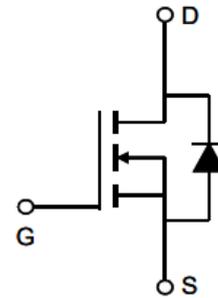
- $V_{DS}=20V$, $I_D=2.3A$
 $R_{DS(ON)} < 60m\Omega @ V_{DS}=4.5V$
 $R_{DS(ON)} < 90m\Omega @ V_{DS}=2.5V$
- High power and current handling capability
- Termination is Lead-free and RoHS Compliant



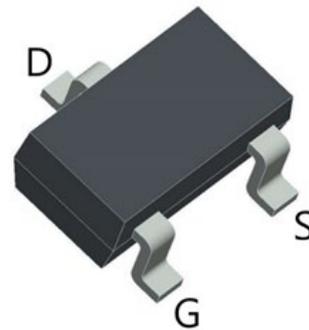
Applications

- PWM applications
- Load switch
- Power Management

schematic diagram



SOT23 Package



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	2.3	A
Pulsed Drain Current ^B	I_{DM}	12	A
Maximum Power Dissipation ^A	P_D	0.7	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction to Ambient	R_{QJA}	162	$^\circ C/W$
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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}	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate-Threshold Voltage	$V_{th(GS)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.65	1.1	V
Gate-body Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 10V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=2.5A$		45	60	m Ω
		$V_{GS}=2.5V, I_D=2.0A$		55	90	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=1.0A$	2			S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, F=1MHz$		260		pF
Output Capacitance	C_{oss}			48		
Reverse Transfer Capacitance	C_{rss}			27		
Switching Capacitance						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, R_L=2.9\Omega, V_{GS}=4.5V, R_{GEN}=3\Omega$		2.5		nS
Turn-on Rise Time	t_r			3.2		nS
Turn-off Delay Time	$t_{d(off)}$			21		nS
Turn-off Fall Time	t_f			3.0		nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=2A, V_{GS}=4.5V$		2.9		nC
Gate-Source Charge	Q_{gs}			0.4		nC
Gate-Drain Charge	Q_{gd}			0.6		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_D=5A$			1.2	V
Diode Forward Current	I_S				2.0	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

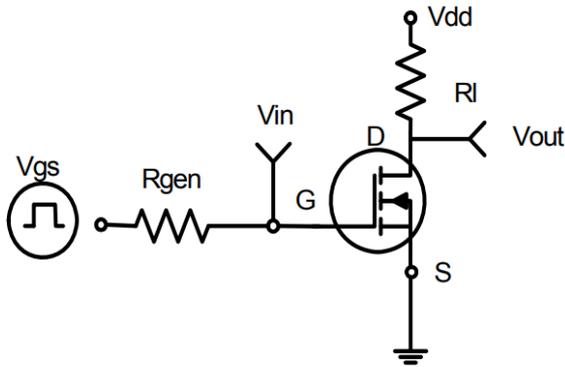


Figure 1: Switching Test Circuit

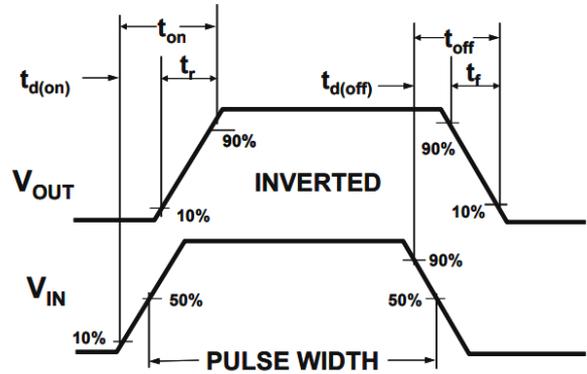


Figure 2: Switching Waveforms

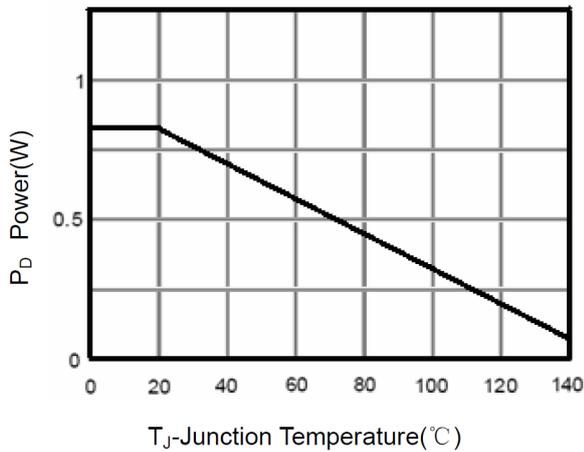


Figure 3 Power Dissipation

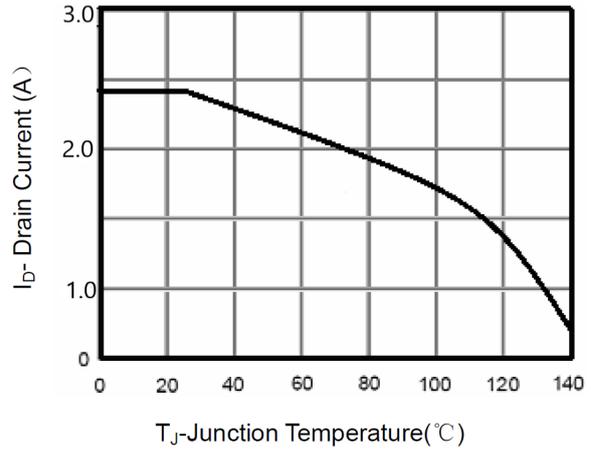


Figure 4 Drain Current

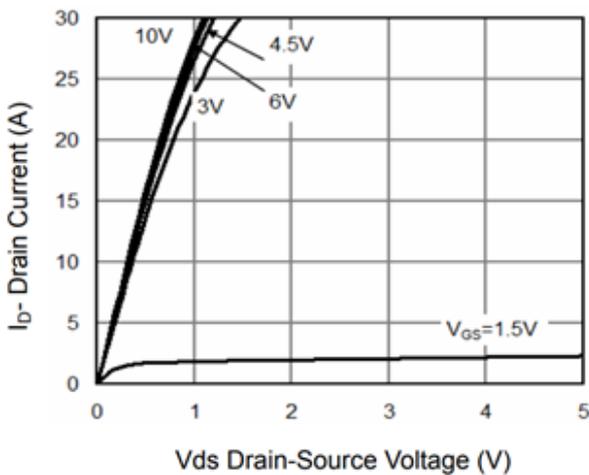


Figure 5 Output Characteristics

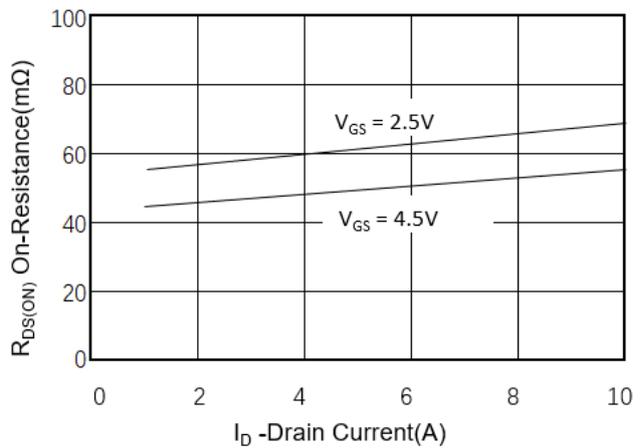
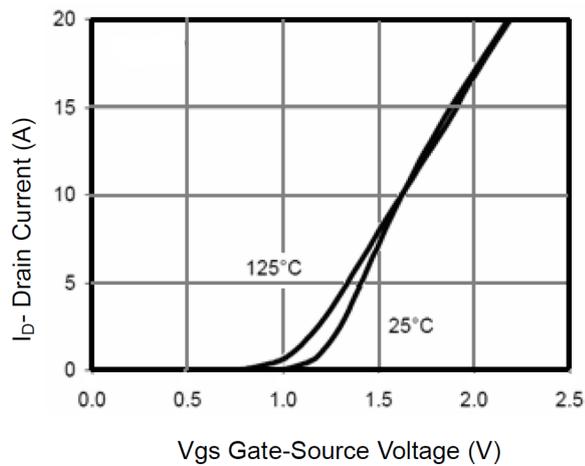
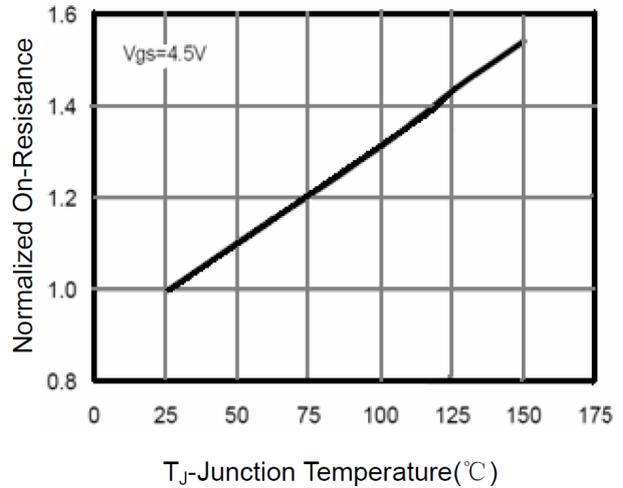


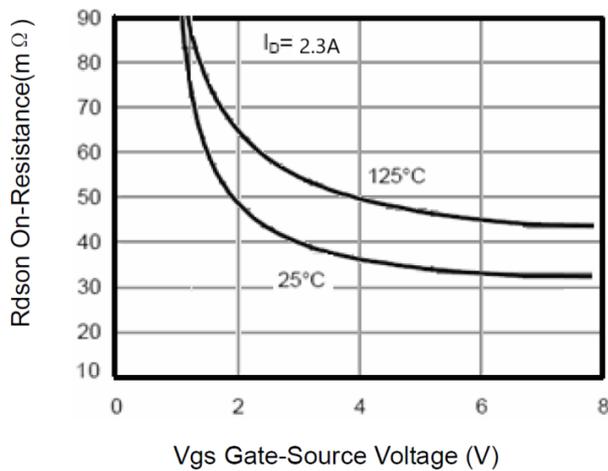
Figure 6 Drain-Source On-Resistance



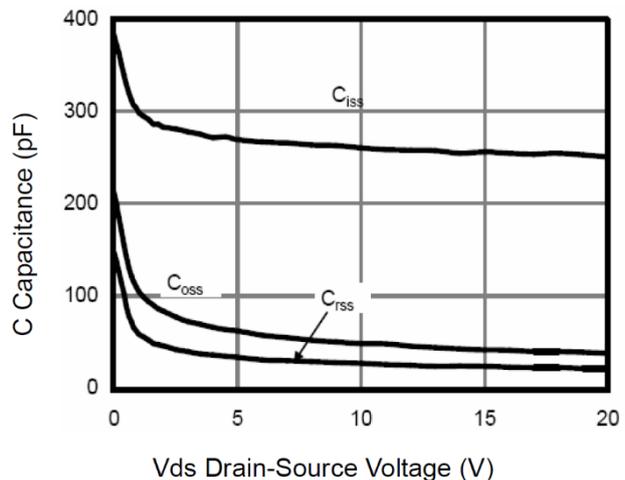
Vgs Gate-Source Voltage (V)
Figure 7 Transfer Characteristics



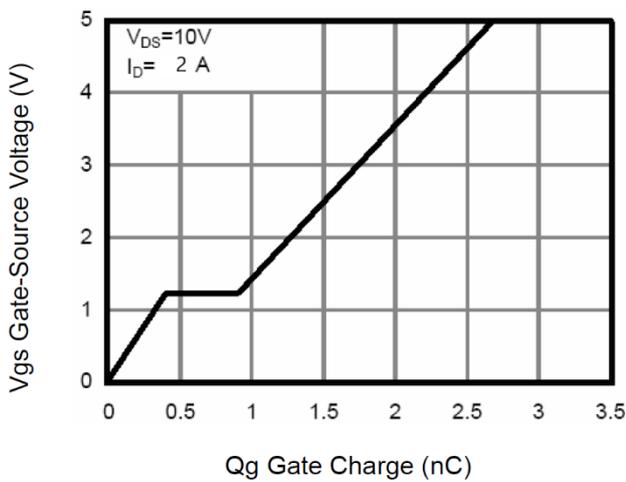
T_J -Junction Temperature(°C)
Figure 8 Drain-Source On-Resistance



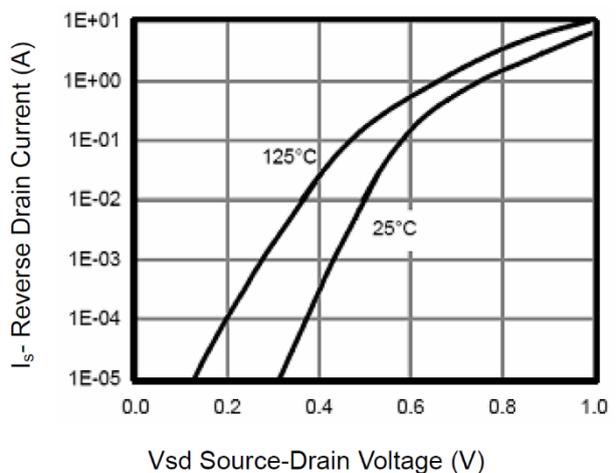
Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 10 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 11 Gate Charge



Vsd Source-Drain Voltage (V)
Figure 12 Source- Drain Diode Forward

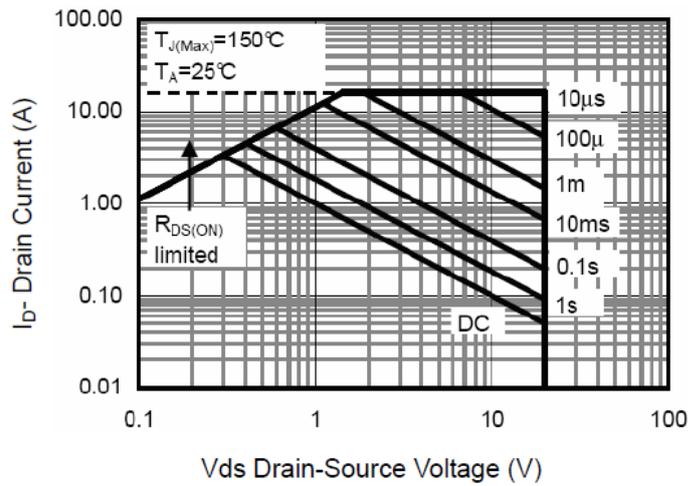


Figure 13 Safe Operation Area

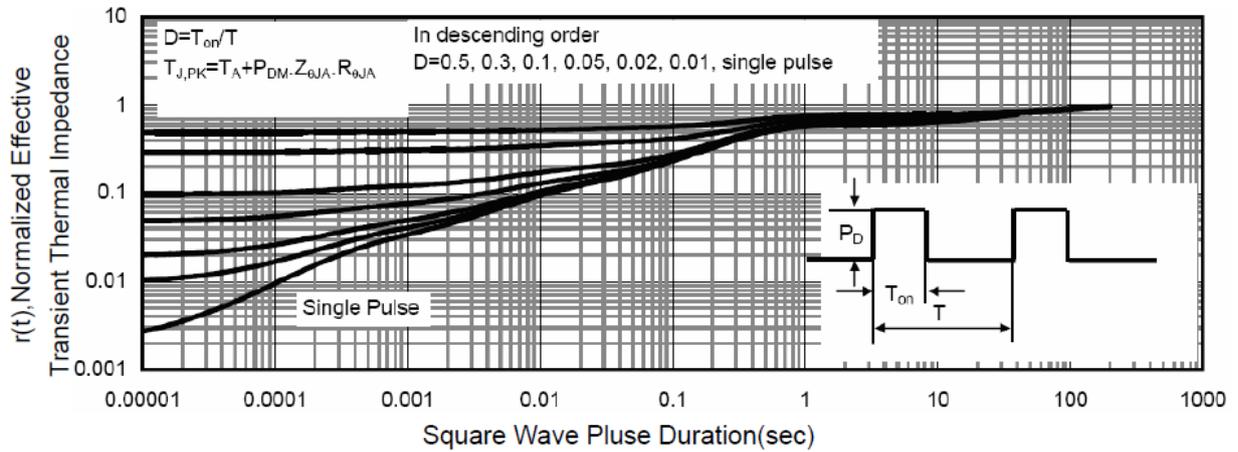
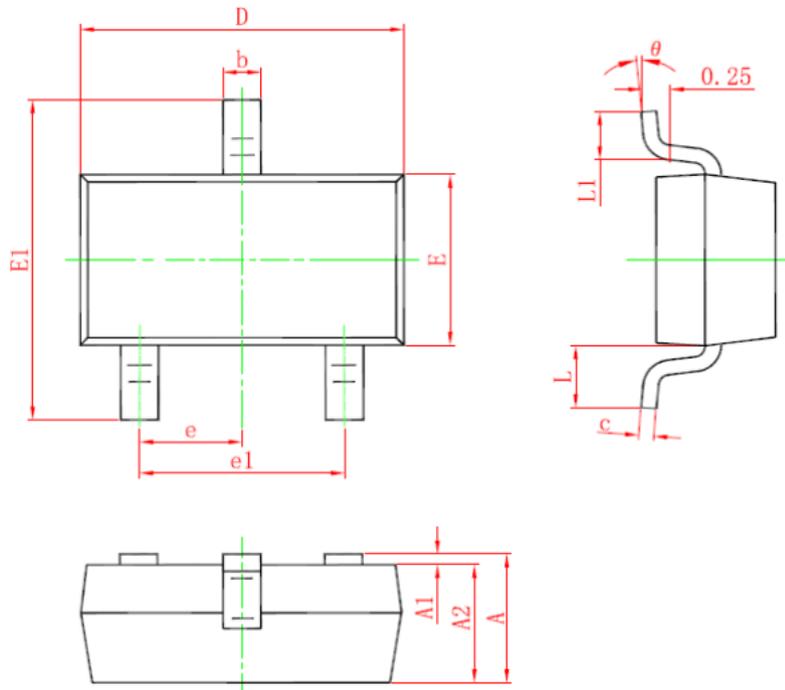


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23 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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