

## CHIPLINK N-Channel Enhancement Mode Power MOSFET

### Description

The LX3400S 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.

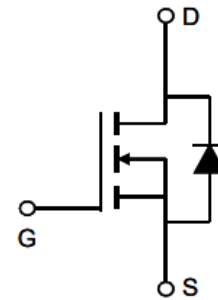
### Features

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

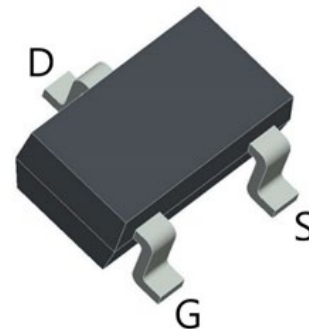


### Applications

- PWM applications
- Load switch
- Power Management



schematic diagram



SOT23 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	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	5.1	A
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	20	A
Maximum Power Dissipation <sup>A</sup>	$P_D$	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	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5A$		24	33	m $\Omega$
		$V_{GS}=4.5V, I_D=4A$		26	39	m $\Omega$
		$V_{GS}=2.5V, I_D=3A$		33	55	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=5A$	10			S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=15V, V_{GS}=0V, F=1MHz$		595		$\mu F$
Output Capacitance	$C_{OSS}$			39		
Reverse Transfer Capacitance	$C_{RSS}$			36		
<b>Switching Capacitance</b>						
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
<b>Drain-Source Diode Characteristics</b>						
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

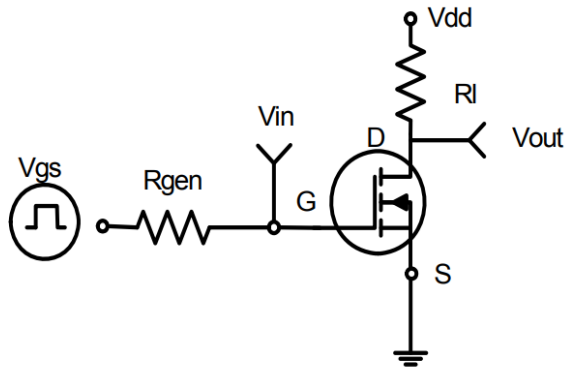


Figure 1: Switching Test Circuit

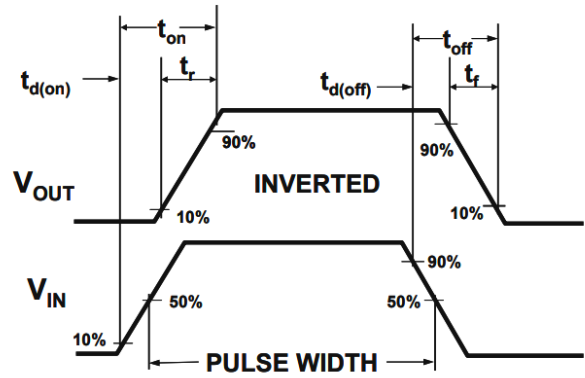
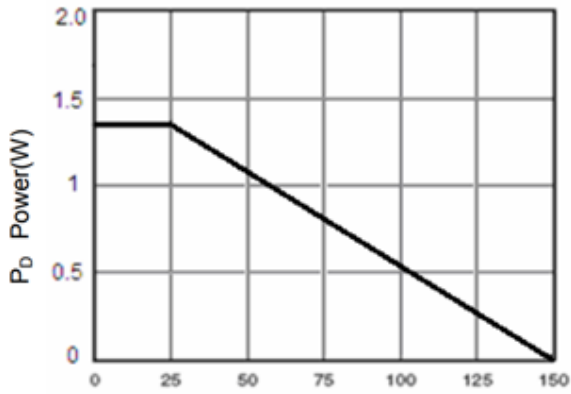
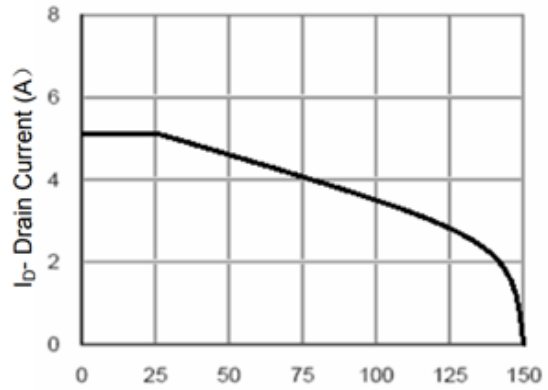


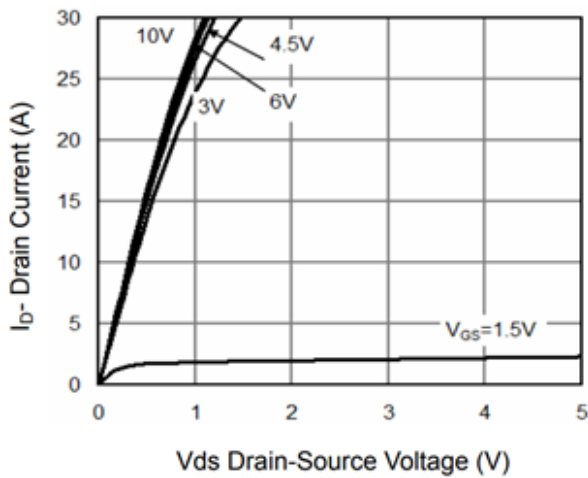
Figure 2: Switching Waveforms



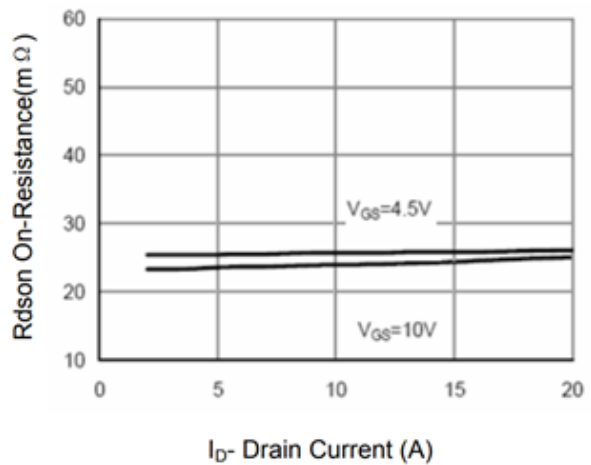
T<sub>J</sub>-Junction Temperature(°C)  
Figure 3 Power Dissipation



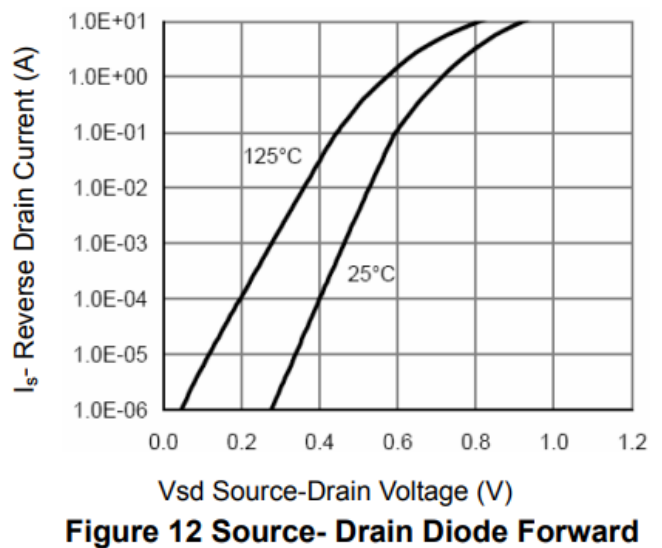
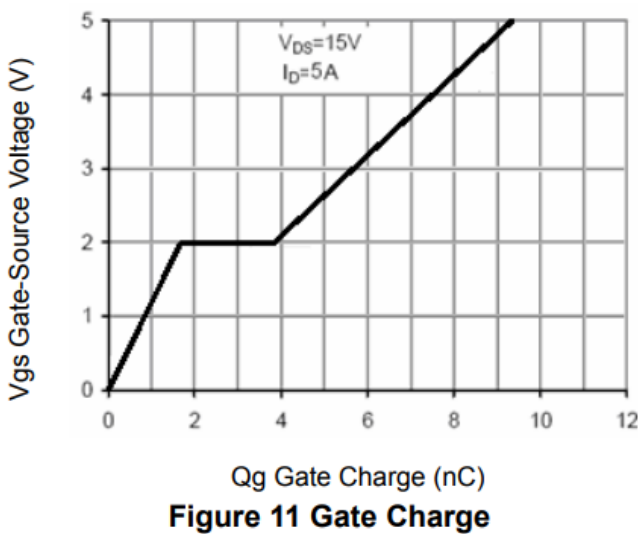
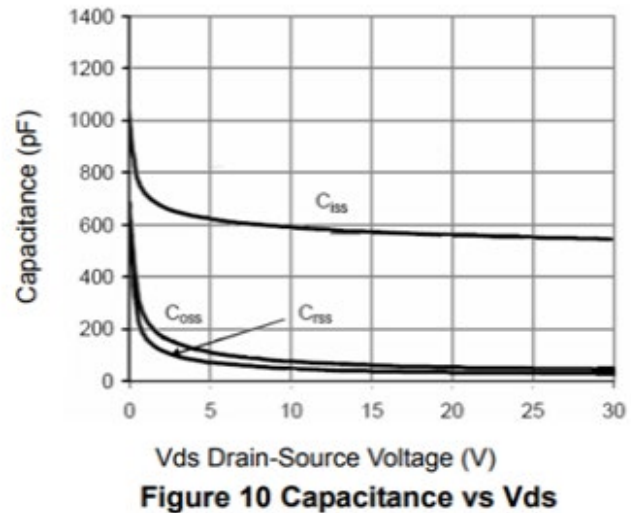
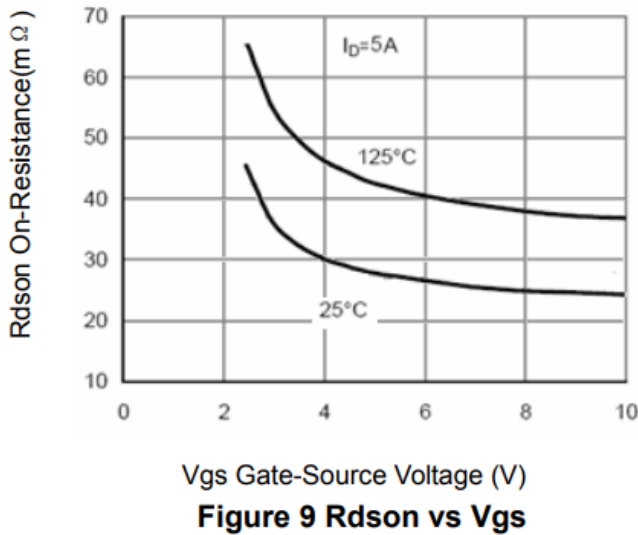
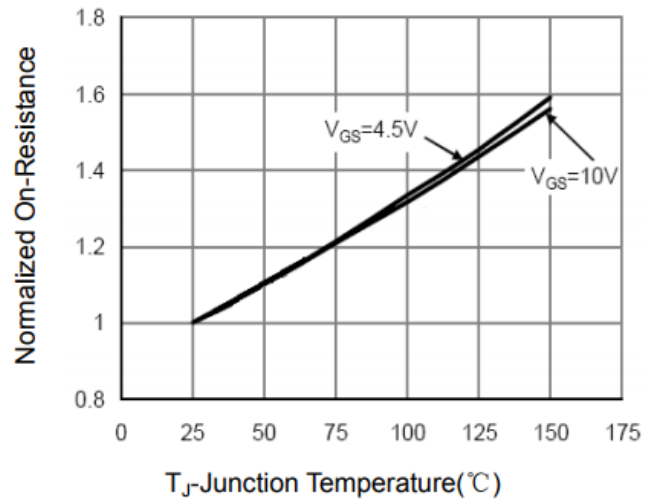
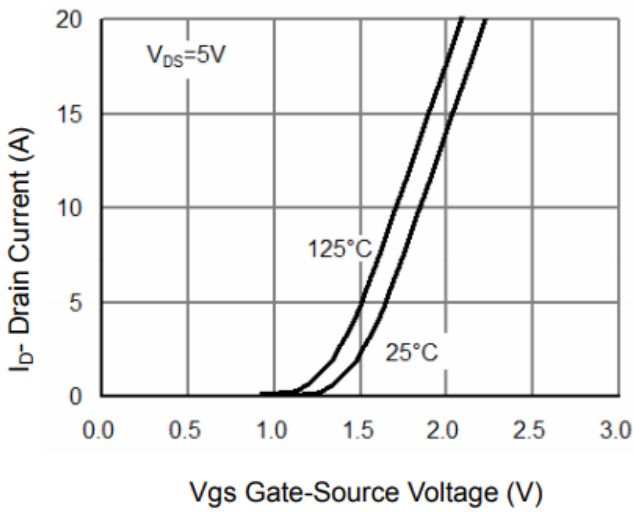
T<sub>J</sub>-Junction Temperature(°C)  
Figure 4 Drain Current

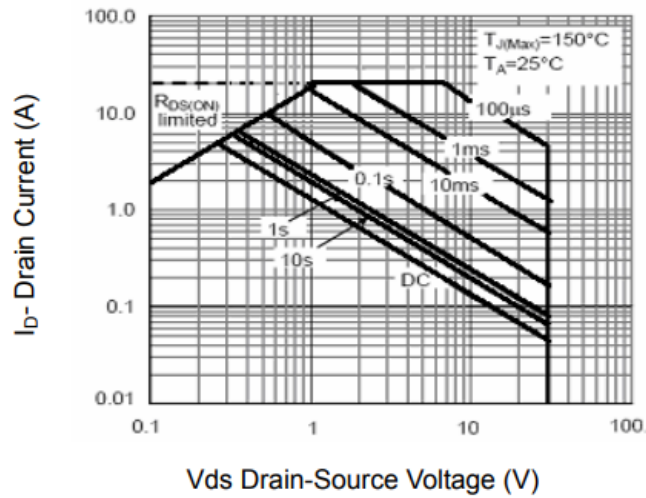


V<sub>ds</sub> Drain-Source Voltage (V)  
Figure 5 Output Characteristics

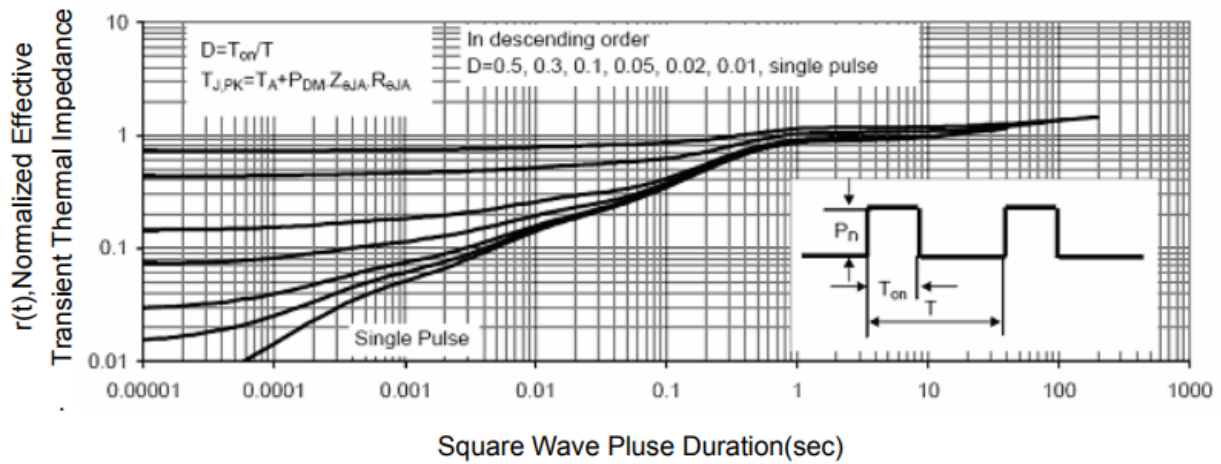


I<sub>D</sub>- Drain Current (A)  
Figure 6 Drain-Source On-Resistance

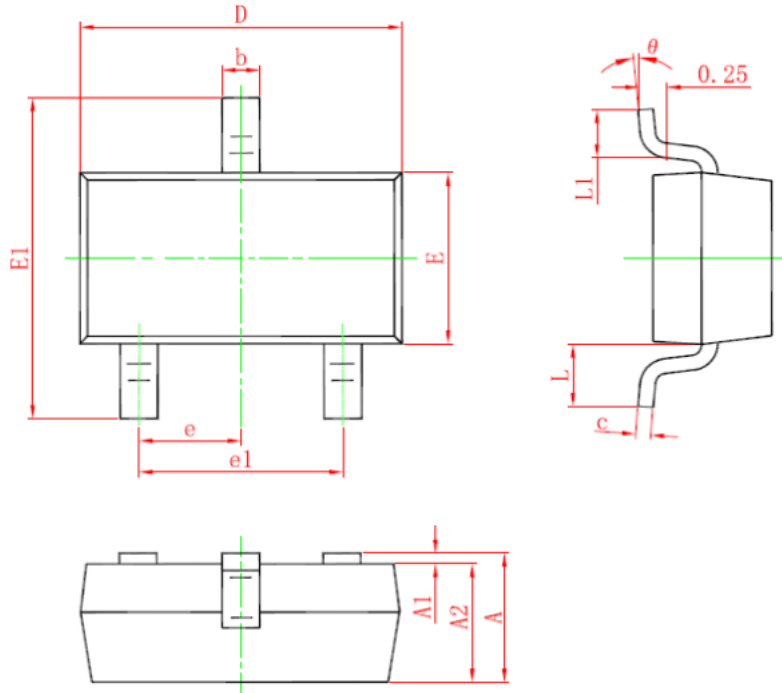




**Figure 13 Safe Operation Area**



**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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