MLS3402

30V/4A N-Channel MOSFET

Features

- Trench Power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$
- High Speed switching

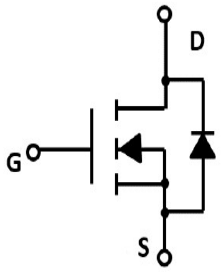
Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
30V	52mΩ@10V	4A
	65mΩ@4.5V	

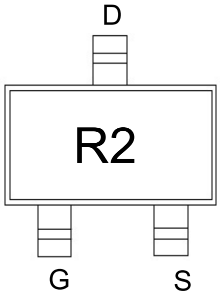
Application

- Battery protection
- Load switch
- Power management

SOT-23 top view



Schematic diagram



R2: Device code

Marking and pin assignment

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings (TA=25℃unless otherwise noted)				
Symbol	**Parameter**		**Rating**	**Unit**
Common Ratings (TC=25°C Unless Otherwise Noted)				
V_{DS}	Drain-Source Breakdown Voltage		30	V
V_{GS}	Gate-Source Voltage		±12	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 155	°C
I_S	Diode Continuous Forward Current	Tc=25°C	4	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	15	A
I_D	Continuous Drain Current	Tc=25°C	4	A
P_D	Maximum Power Dissipation	Tc=25°C	1.4	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		104	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS3402	SOT-23	R2	3,000	45,000	180,000	7"reel

Electrical Characteristics (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	–	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	–	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.65	0.90	1.50	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=4A	–	33	52	mΩ
		V_{GS}=4.5V, I_D=3A	–	38	65	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	–	285	--	pF
C_{OSS}	Output Capacitance		–	33	--	pF
C_{RSS}	Reverse Transfer Capacitance		–	27	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=15V, I_D=4A, V_{GS}=4.5V	–	2.6	--	nC
Q_{gs}	Gate Source Charge		–	0.6	--	nC
Q_{gd}	Gate Drain Charge		–	0.9	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=15V, I_D=2A, V_{GS}=4.5V, R_G=3Ω	--	15	--	nS
t_r	Turn-on Rise Time		–	42	--	nS
$t_{d(off)}$	Turn-Off Delay Time		–	16	--	nS
t_f	Turn-Off Fall Time		–	10	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃, Is=4A	–	--	1.2	V

Typical Operating Characteristics

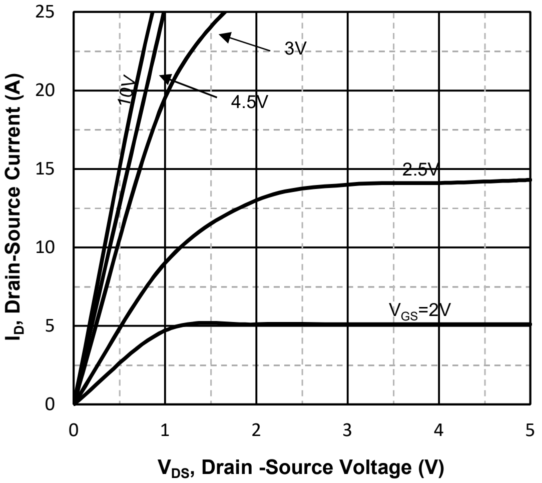


Fig1. Typical Output Characteristics

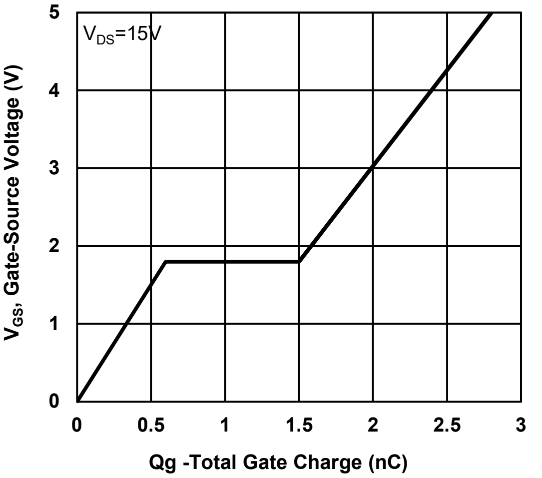


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

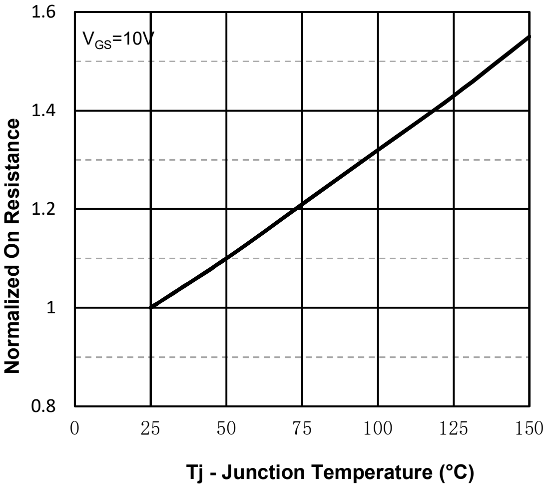


Fig3. Normalized On-Resistance Vs. Temperature

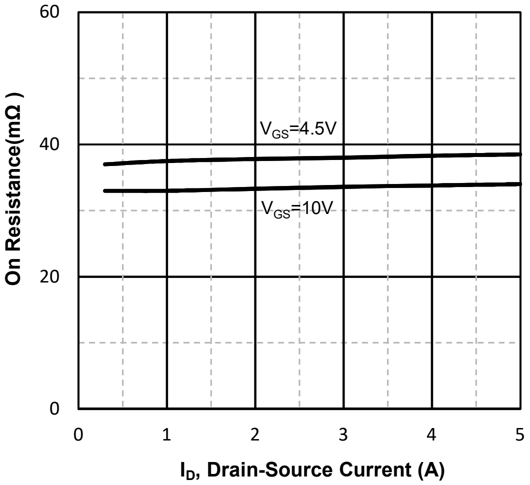


Fig4. On-Resistance Vs. Drain-Source

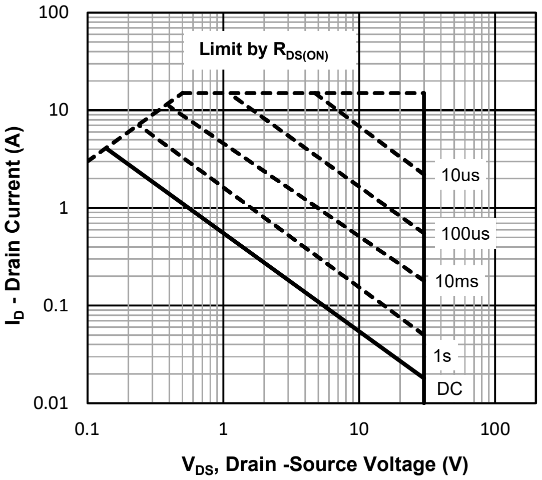


Fig5. Maximum Safe Operating Area

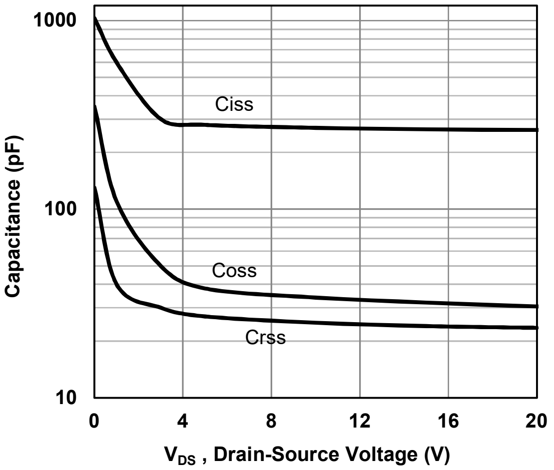
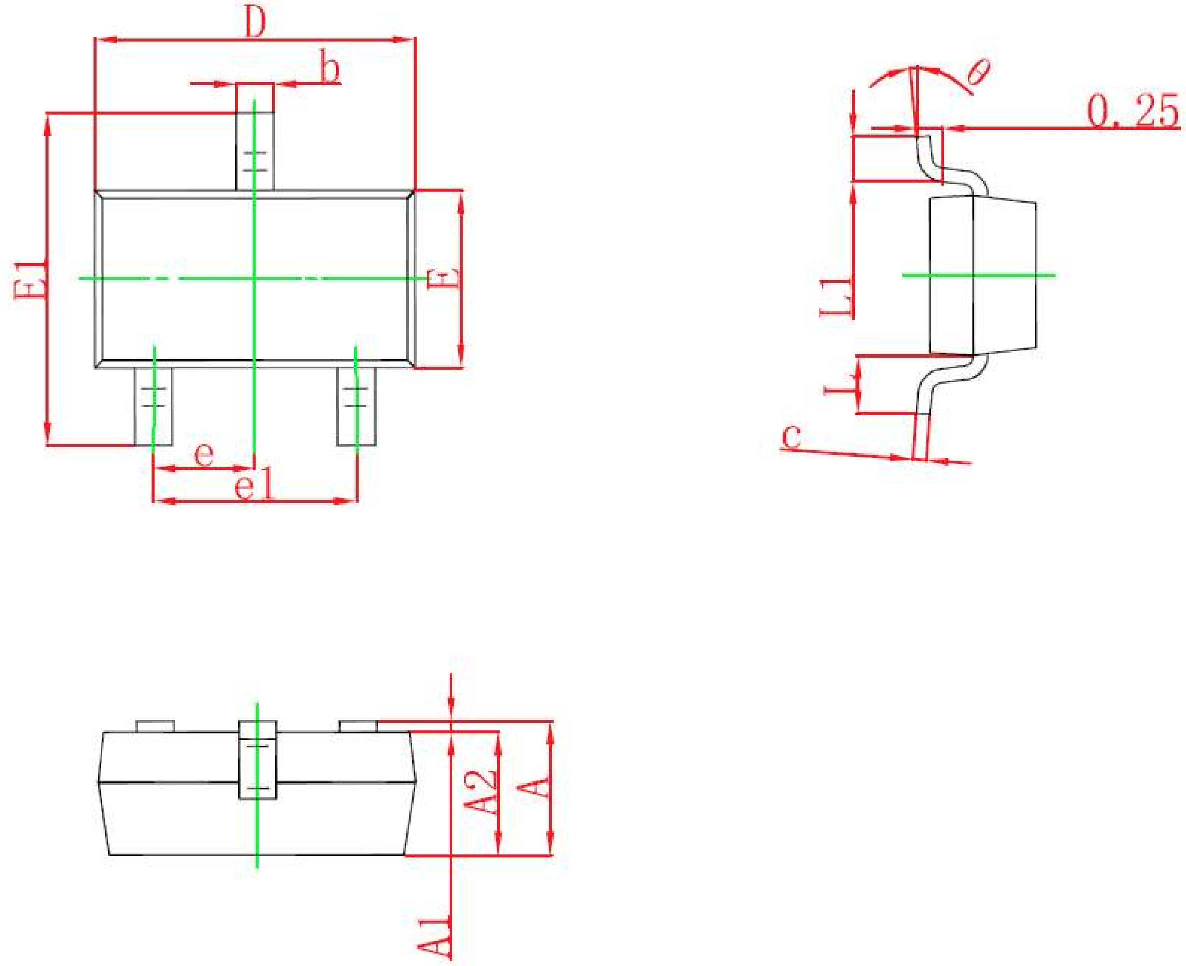


Fig6 Typical Capacitance Vs.Drain-Source Voltage

SOT-23 Package information



Symbol	Dimensions in Millimeters(mm)		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
E1	2.250	2.550	0.088	0.100
E	1.200	1.400	0.047	0.055
e	0.950TYP		0.037TYP	
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°