

Features

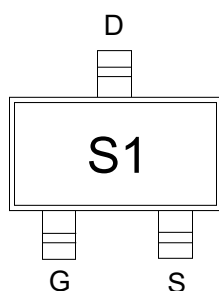
- Leading trench technology for low $R_{DS(on)}$
- Low Gate Charge

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
-20V	90mΩ@-4.5V	-2.5A
	130mΩ@-2.5V	

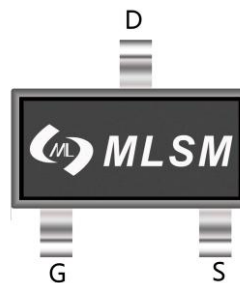
Application

- Video monitor
- Power management

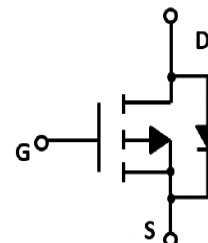


S1: Device code

Marking and pin assignment



SOT-523 top view



Schematic diagram



Pb-Free



RoHS



Halogen-Free

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit
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Common Ratings (TC=25°C Unless Otherwise Noted)

V_{DS}	Drain-Source Breakdown Voltage	-20	V
V_{GS}	Gate-Source Voltage	±10	V
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
I_S	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ -2.5	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ -7.8	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$ -2.5	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 0.7	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	125	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS2301T	SOT-523	S1	3,000	45,000	180,000	7" reel

Electrical Characteristics (T_J=25°C 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	VGS=0V, ID=-250μA	-20	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-20V, VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±10V, VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=-250μA	-0.4	-0.62	-1.0	V
RDS(on)	Drain-Source On-State Resistance	VGS=-4.5V, ID=-2.5A	--	90	130	mΩ
		VGS=-2.5V, ID=-1.5A	--	130	200	mΩ
		VGS=-1.8V, ID=-1.0A	--	180	350	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
CISS	Input Capacitance	VDS=-10V, VGS=0V, f=1MHz	--	248	--	pF
COSS	Output Capacitance		--	42	--	pF
CRSS	Reverse Transfer Capacitance		--	31	--	pF
Switching Characteristics						
Qg	Total Gate Charge	VDS=-10V, ID=-2.5A, VGS=-4.5V	--	2.9	--	nC
Qgs	Gate Source Charge		--	0.45	--	nC
Qgd	Gate Drain Charge		--	0.75	--	nC
td(on)	Turn-on Delay Time	VDD=-10V, RL=5Ω, VGS=-4.5V, RG=3Ω	--	9.8	--	nS
tr	Turn-on Rise Time		--	4.9	--	nS
td(off)	Turn-Off Delay Time		--	20.5	--	nS
tf	Turn-Off Fall Time		--	7	--	nS
Source- Drain Diode Characteristics						
VSD	Forward on voltage	TJ=25°C, IS=-2.5A	--	--	-1.2	V

Typical Operating Characteristics

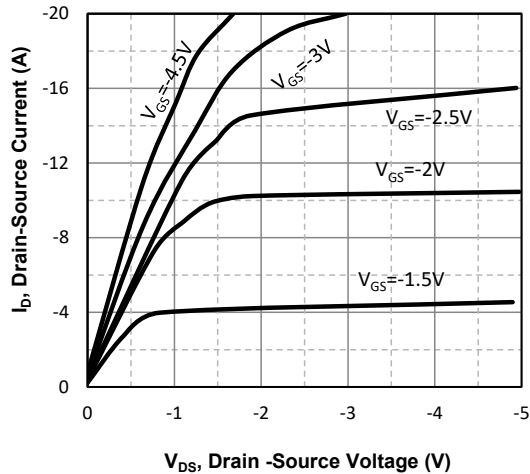


Fig1. Typical Output Characteristics

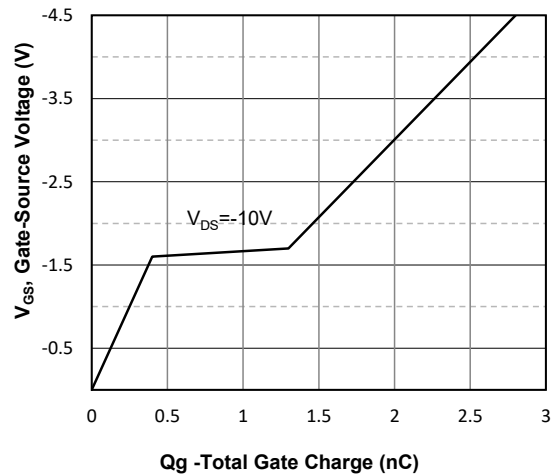


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

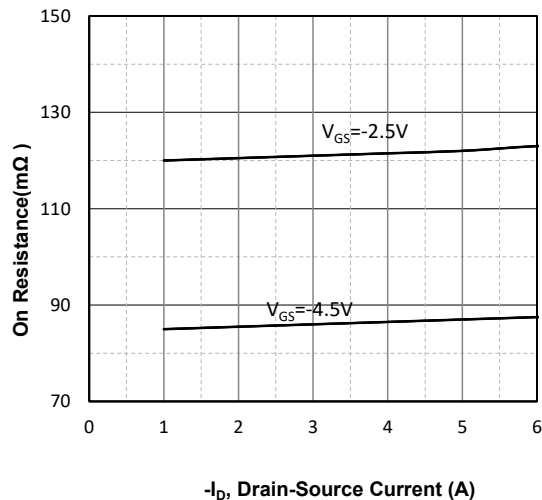


Fig3. Drain-Source on Resistance

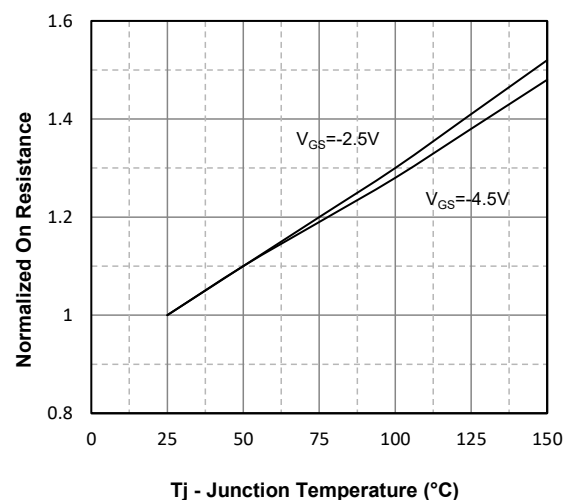


Fig4. Normalized On-Resistance Vs. Temperature

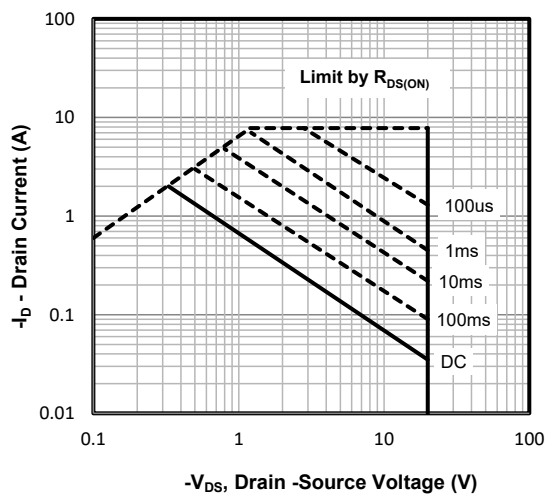


Fig5. Maximum Safe Operating Area

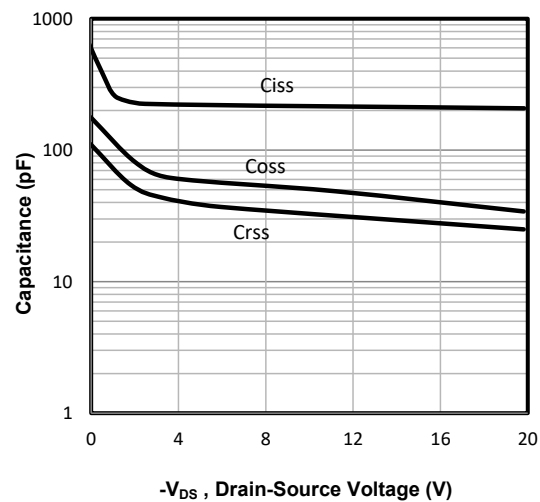
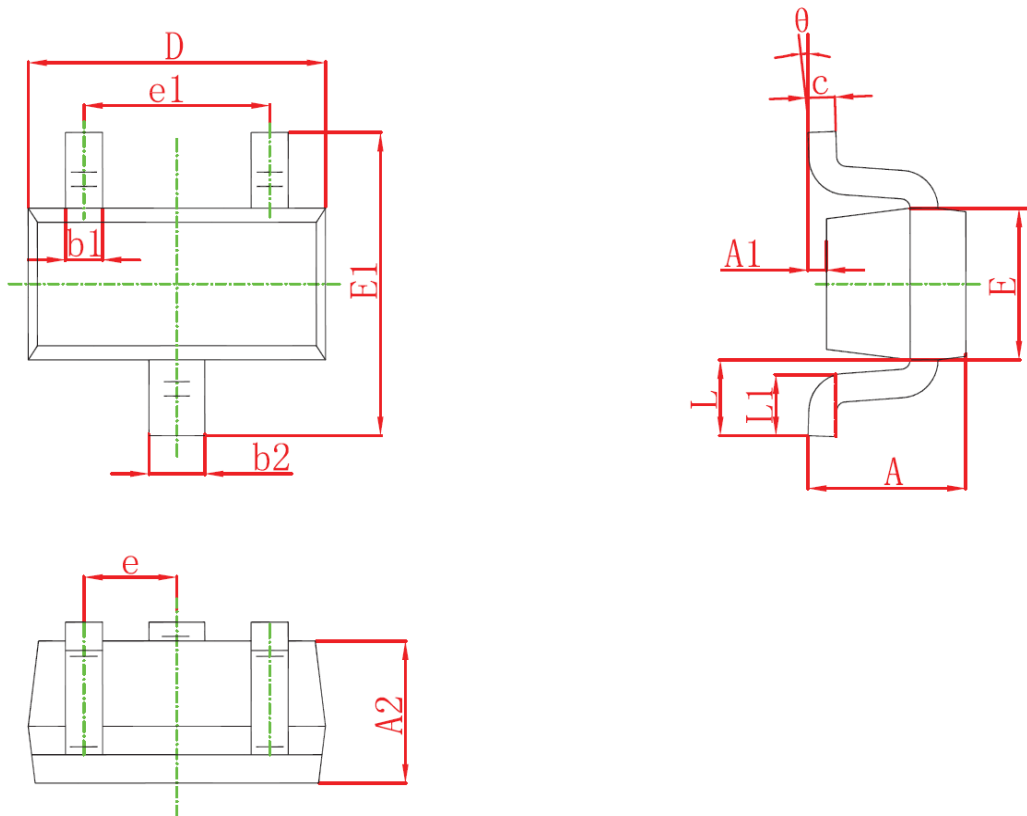


Fig6 Typical Capacitance Vs. Drain-Source Voltage

SOT-523 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500TYP		0.020TYP	
e1	0.900	1.100	0.035	0.043
L	0.400REF		0.016REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°