

Features

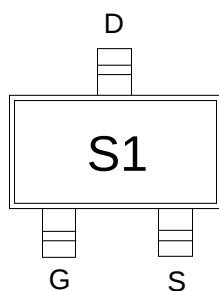
- Leading trench technology for low $R_{DS(on)}$
- Low Gate Charge

Product Summary

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

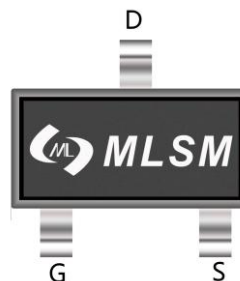
Application

- Video monitor
- Power management

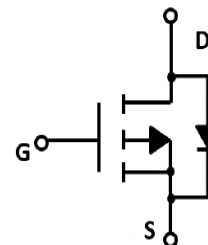


S1: Device code

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	$T_C=25^{\circ}C$ -2.5	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}C$ -7.8	A
I_D	Continuous Drain Current	$T_C=25^{\circ}C$ -2.5	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$ 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℃ unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25℃ (unless otherwise stated)						
B _{V(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±10V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.62	-0.9	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-2.5A	--	90	160	mΩ
		V _{GS} =-2.5V, I _D =-1.5A	--	130	200	mΩ
Dynamic Electrical Characteristics @ T _J = 25℃ (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	--	248	--	pF
C _{OSS}	Output Capacitance		--	42	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	31	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-2.5A, V _{GS} =-4.5V	--	2.9	--	nC
Q _{gs}	Gate Source Charge		--	0.45	--	nC
Q _{gd}	Gate Drain Charge		--	0.75	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, R _L =5Ω, V _{GS} =-4.5V, R _G =3Ω	--	9.8	--	nS
t _r	Turn-on Rise Time		--	4.9	--	nS
t _{d(off)}	Turn-Off Delay Time		--	20.5	--	nS
t _f	Turn-Off Fall Time		--	7	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25℃, I _S =-2.5A	--	--	-1.2	V

Typical Operating Characteristics

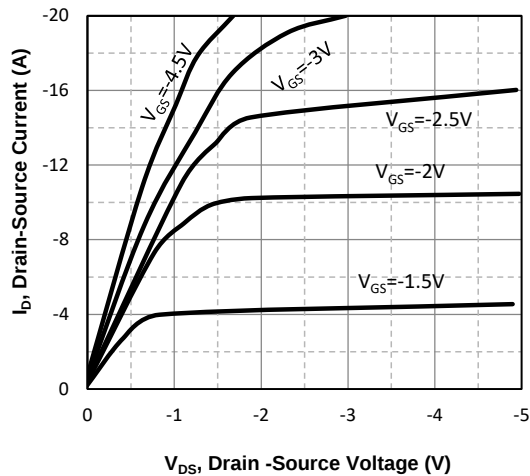


Fig1. Typical Output Characteristics

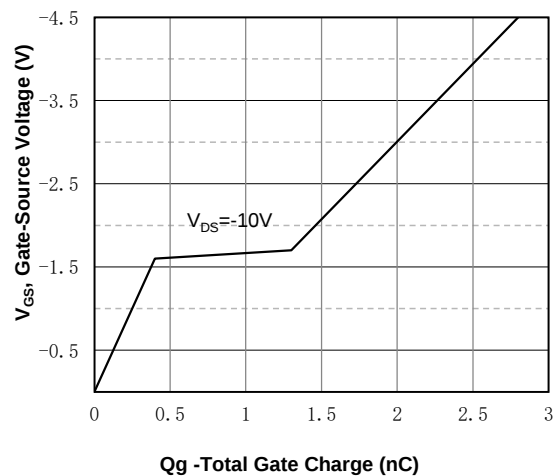


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

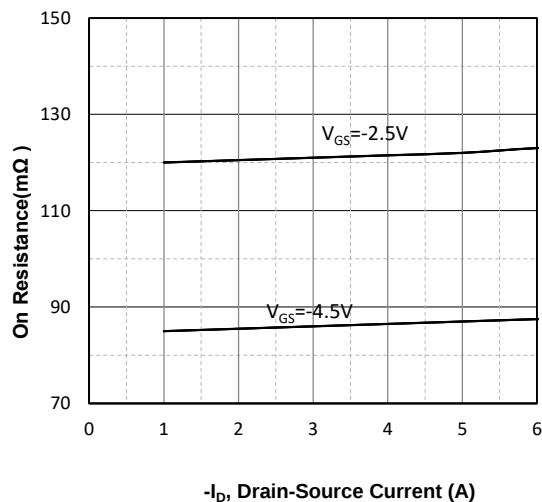


Fig3. Drain-Source on Resistance

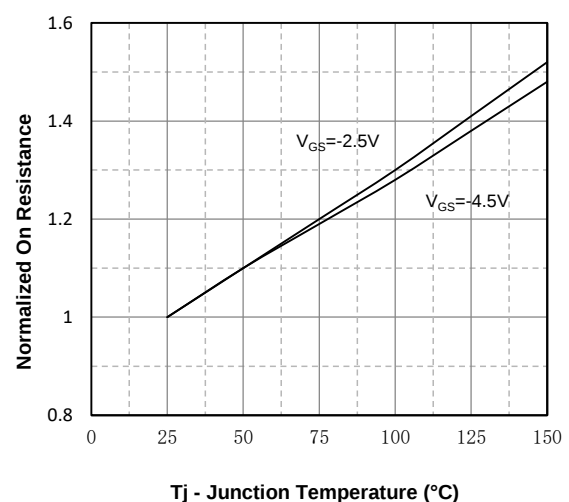


Fig4. Normalized On-Resistance Vs. Temperature

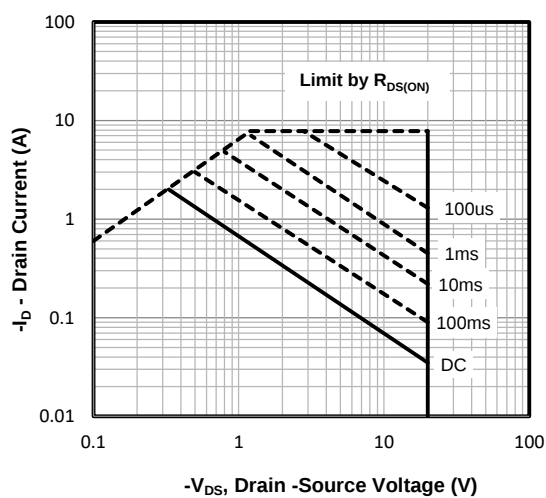


Fig5. Maximum Safe Operating Area

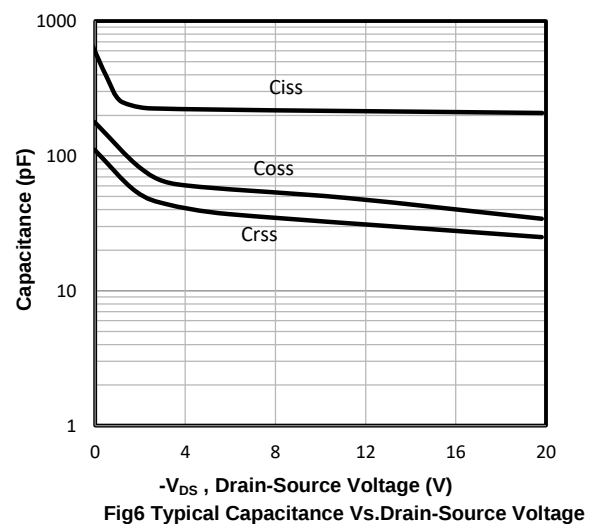
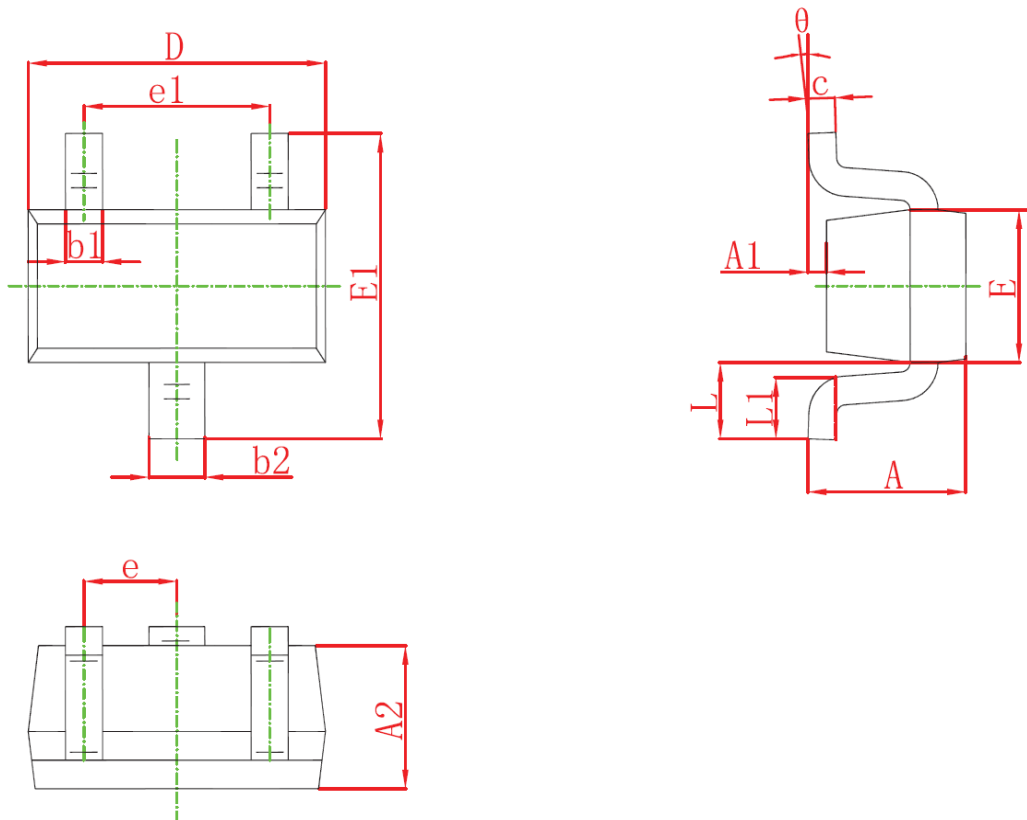


Fig6 Typical Capacitance Vs. Drain-Source Voltage

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°