

Features

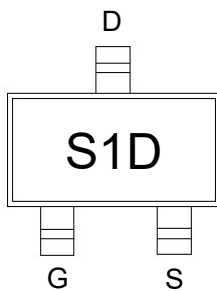
- Leading trench technology for low $R_{DS(on)}$
- Low Gate Charge

Product Summary

V_{DS}	$R_{DS(on)}$ MAX	I_D MAX
-20V	160mΩ@-4.5V	-2.5A
	250mΩ@-2.5V	

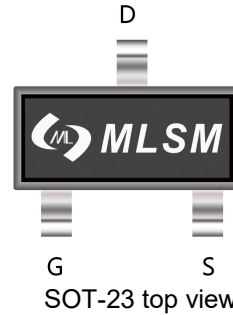
Application

- Video monitor
- Power management

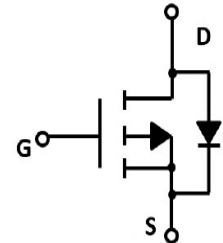


S1D: Device code

Marking and pin assignment



SOT-23 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

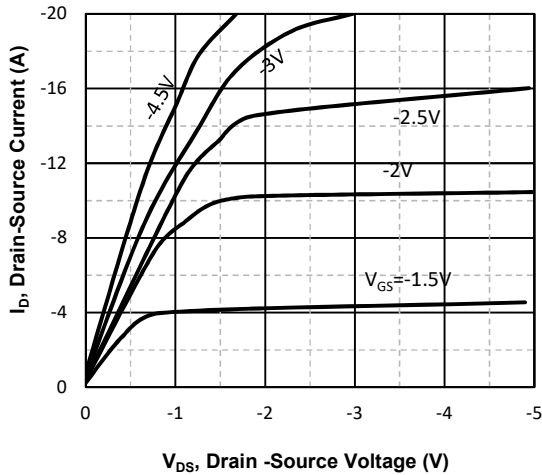
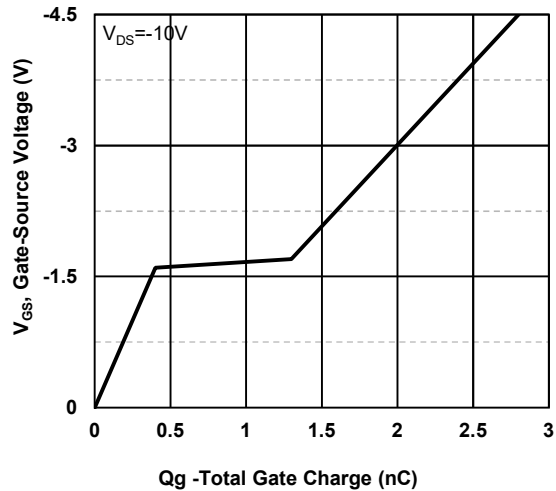
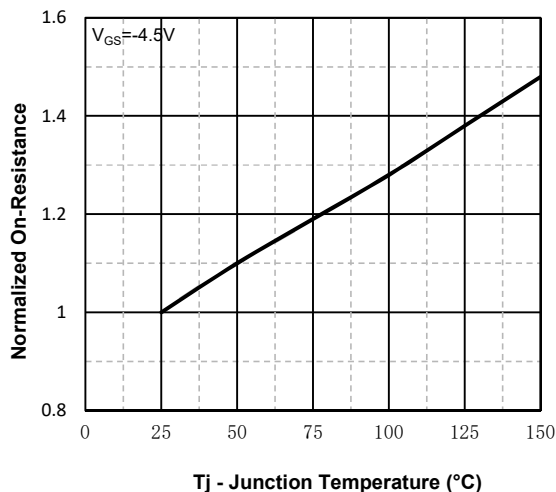
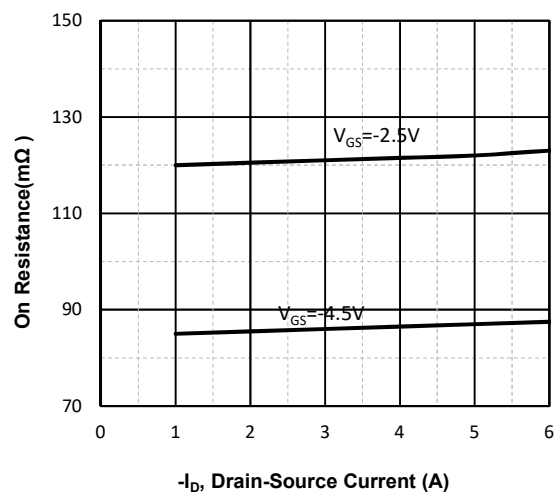
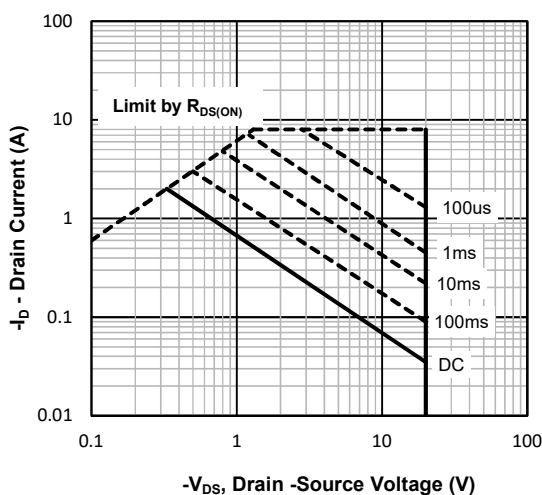
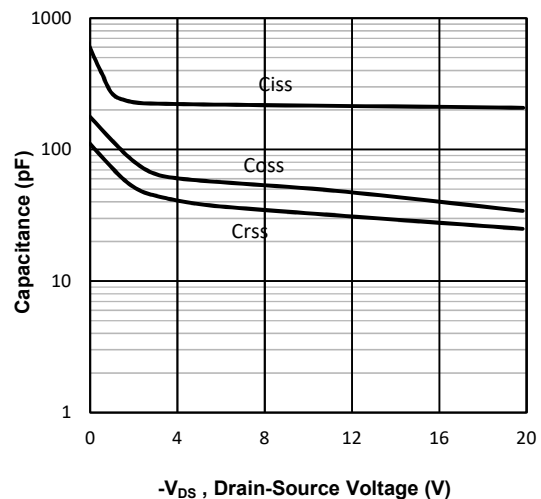
Mounted on Large Heat Sink

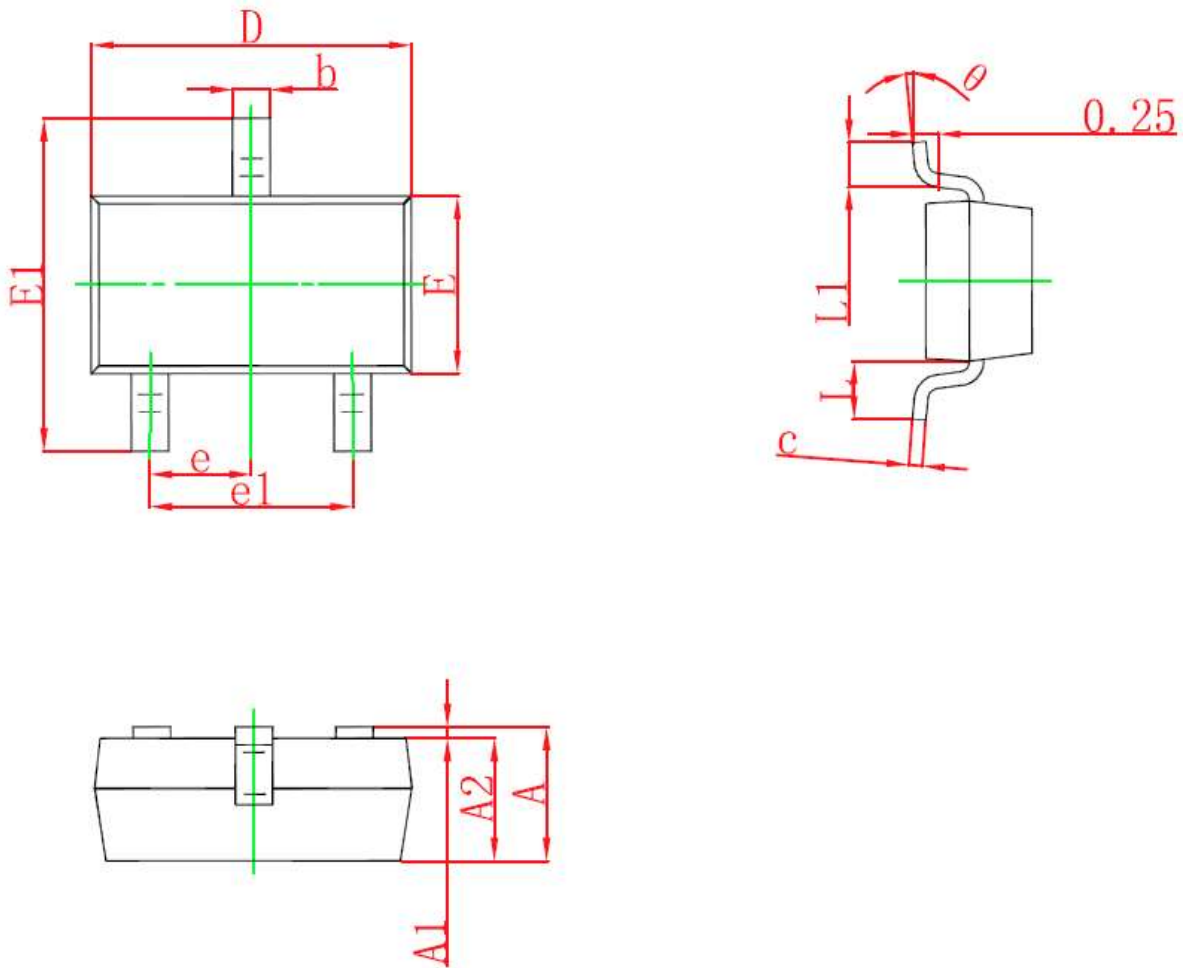
I_{DM}	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ -7.8	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$ -2.5	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 0.7	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	125	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS2301D	SOT-23	S1D	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 @ T_J = 25°C (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	-0.4	-0.62	-1.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-2.5A	--	85	160	mΩ
		V _{GS} =-2.5V, I _D =-1.5A	--	120	250	mΩ
		V _{GS} =-1.8V, I _D =-1.0A	--	180	350	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (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°C, I _S =-2.5A	-	-	-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 Current

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°