

**Features**

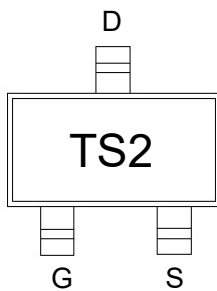
- Trench Power LV MOSFET technology
- High Power and current handing capability

**Product Summary**

$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
20V	68mΩ@4.5V	2.8A
	115mΩ@2.5V	

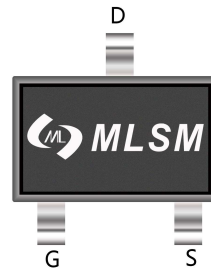
**Application**

- PWM application
- Load switch

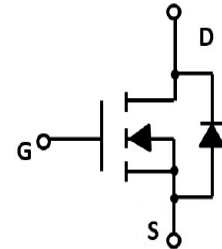


TS2: Device code

Marking and pin assignment



SOT-323 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	-50 to 155	°C
$I_S$	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ 2.8	A

**Mounted on Large Heat Sink**

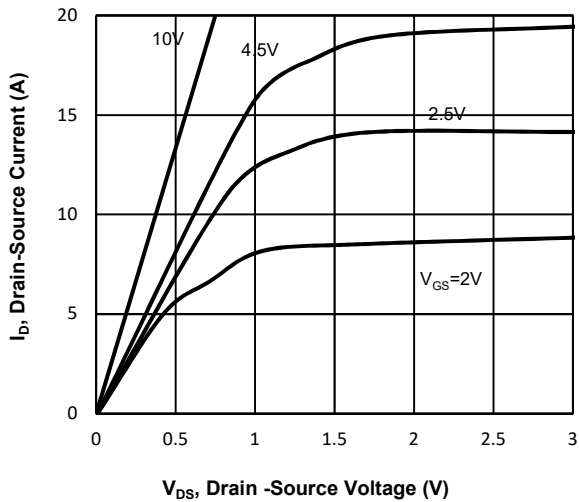
$I_{DM}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ 9	A
$I_D$	Continuous Drain Current	$T_c=25^\circ\text{C}$ 2.8	A
$P_D$	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 0.25	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	500	°C/W

**Ordering Information (Example)**

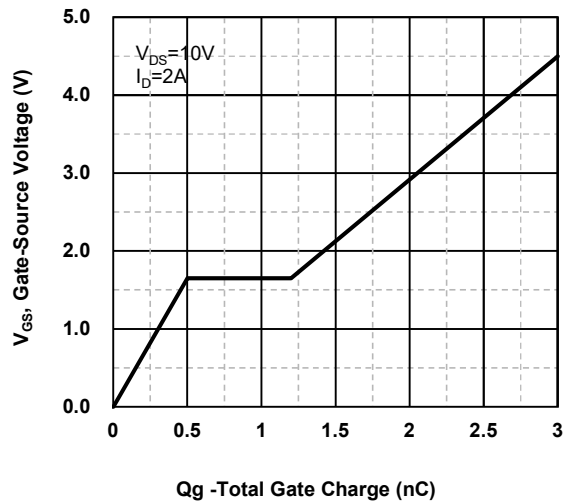
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS2102W	SOT-323	TS2	3,000	45,000	180,000	7" reel

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
BV <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.45	0.7	1.2	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.8A	--	36	68	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.0A	--	50	115	mΩ
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =1.0A	--	80	200	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz	--	200	--	pF
C <sub>OSS</sub>	Output Capacitance		--	35	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	28	--	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =2A, V <sub>GS</sub> =4.5V	--	3	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	0.5	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	0.7	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V, I <sub>D</sub> =2A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =3Ω	--	3	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	11	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	20	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	8	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =2.3A	--	--	1.2	V

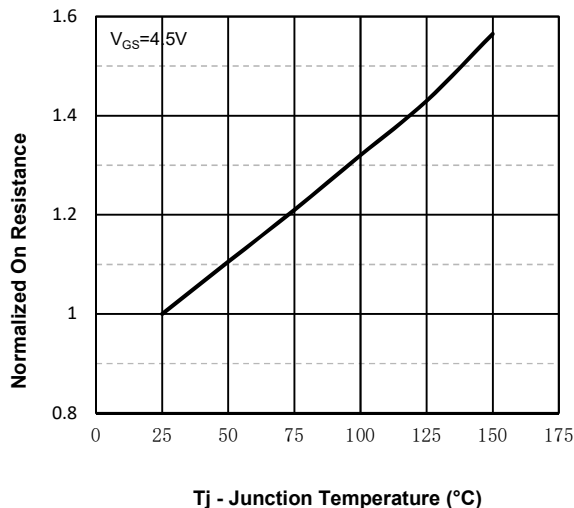
**Typical Operating Characteristics**



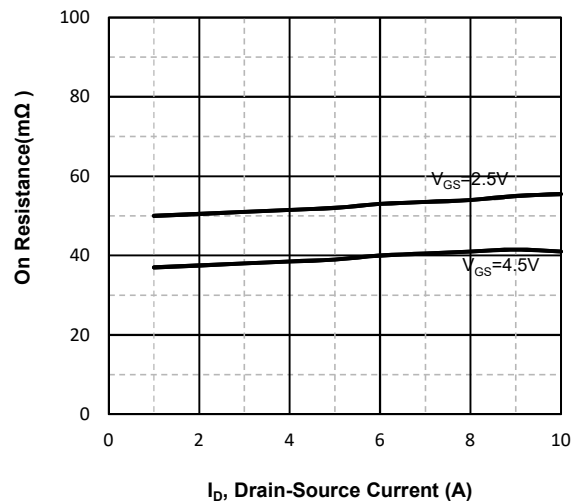
**Fig1. Typical Output Characteristics**



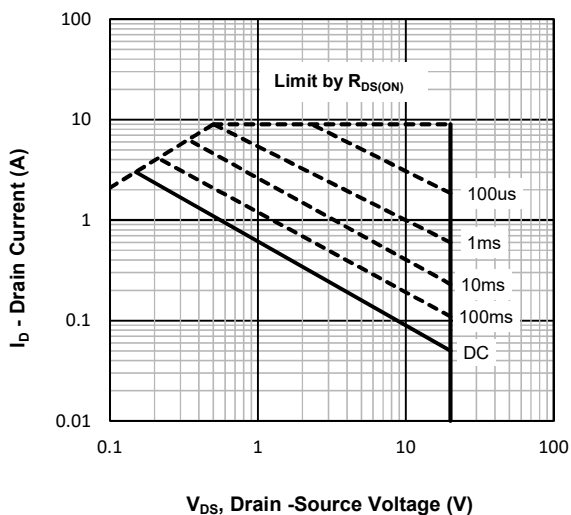
**Fig2. Typical Gate Charge Vs. Gate-Source Voltage**



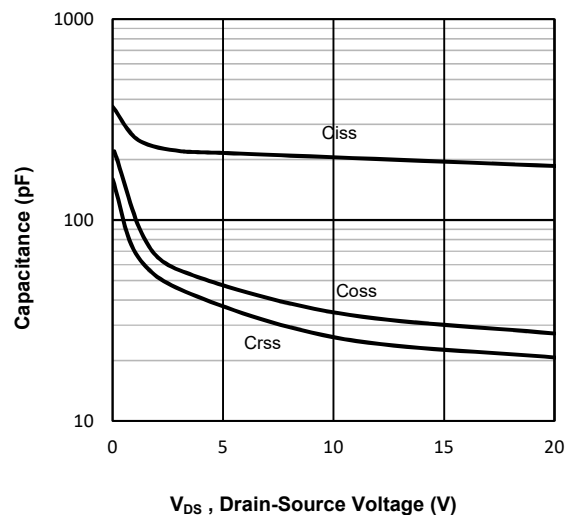
**Fig3. Normalized On-Resistance Vs. Temperature**



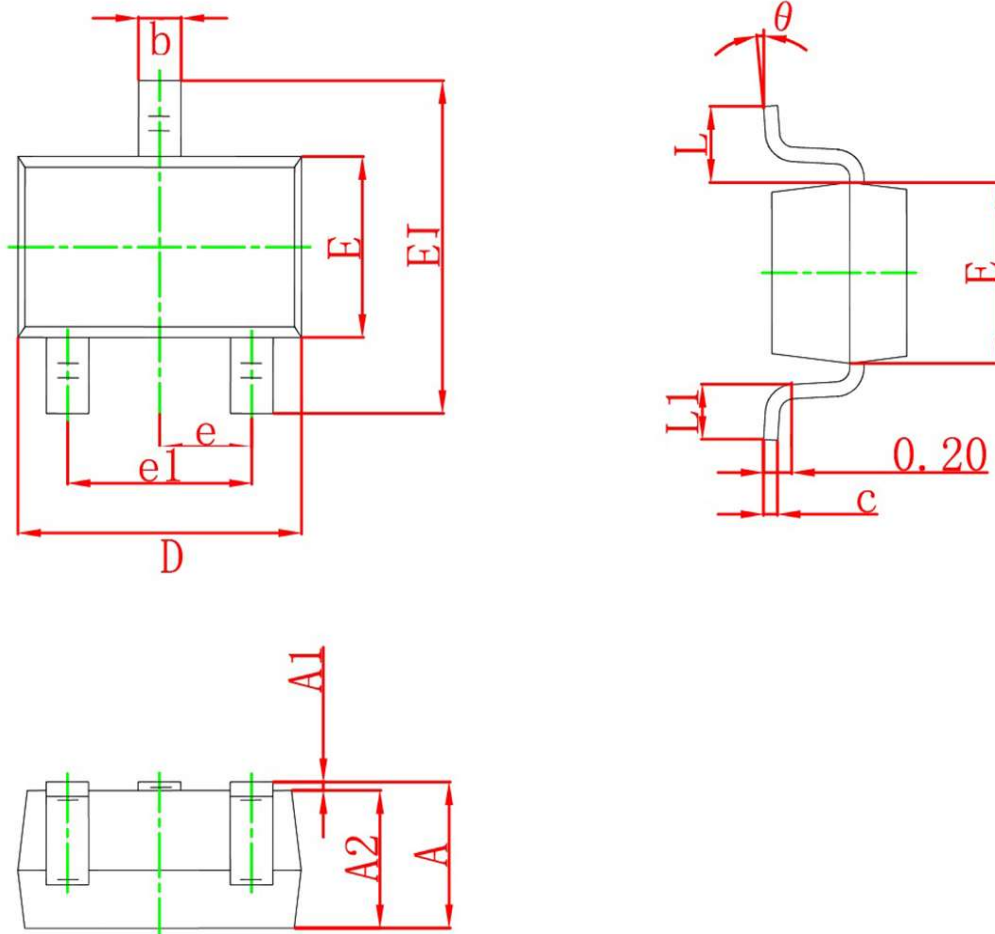
**Fig4. On-Resistance Vs. Drain-Source Current**



**Fig5. Maximum Safe Operating Area**



**Fig6 Typical Capacitance Vs. Drain-Source**

**SOT-323 Package information**


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
theta	0°	8°	0°	8°