

**Features**

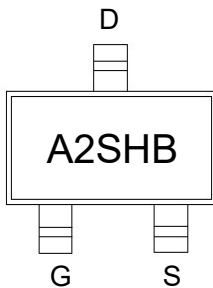
- TrenchFET Power MOSFET
- Low Gate Charge
- Low On-resistance
- Surface Mount Package

**Product Summary**

$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
20V	450mΩ@4.5V	1.6A
	650mΩ@2.5V	

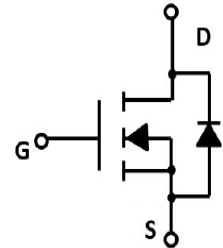
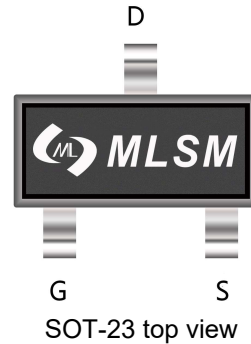
**Application**

- Battery protection
- Load switch
- Power management



A2SHB: Device code

Marking and pin assignment



Schematic diagram



Halogen-Free

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

Symbol	Parameter	Rating	Unit
--------	-----------	--------	------

**Common Ratings (TC=25°C Unless Otherwise Noted)**

$V_{DS}$	Drain-Source Breakdown Voltage	20	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	$T_c=25^\circ\text{C}$ 1.6	A

**Mounted on Large Heat Sink**

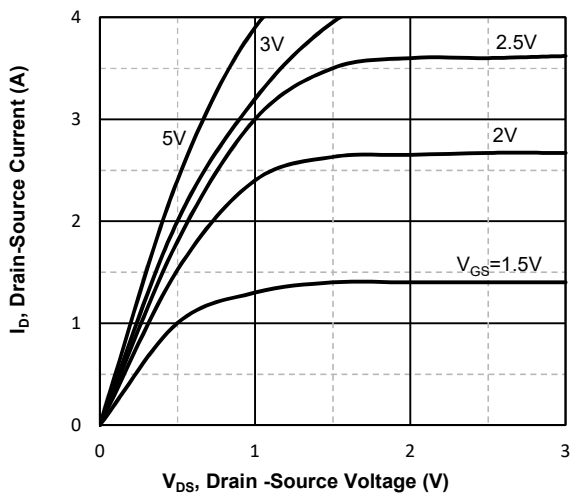
$I_{DM}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ 5.6	A
$I_D$	Continuous Drain Current	$T_c=25^\circ\text{C}$ 1.6	A
$P_D$	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 0.75	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	375	°C/W

**Ordering Information (Example)**

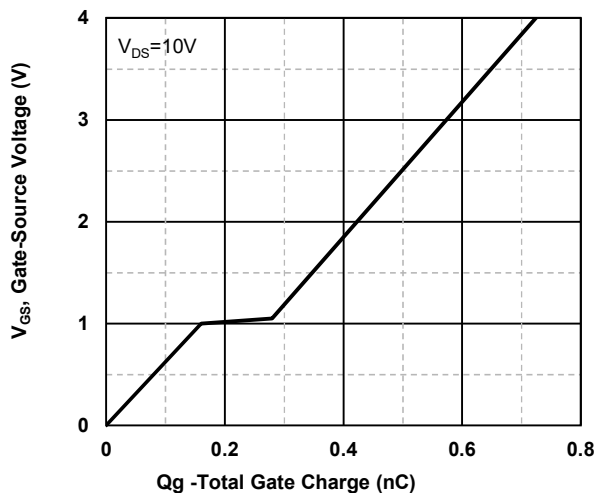
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS2302G	SOT-23	A2SHB	3,000	45,000	180,000	7"reel

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated)						
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> =±12V, 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	0.5	1.0	1.5	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A	--	360	450	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.4A	--	540	650	mΩ
Dynamic Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated)						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz	--	35	--	pF
C <sub>OSS</sub>	Output Capacitance		--	9.5	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	8.8	--	pF
Switching Characteristics						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =0.5A, V <sub>GS</sub> =4.5V	--	0.8	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	0.1	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	0.2	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V, I <sub>D</sub> =0.5A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =3Ω	--	7	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	10	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	35	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	15	--	nS
Source- Drain Diode Characteristics						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =1.6A	--	0.8	1.2	V

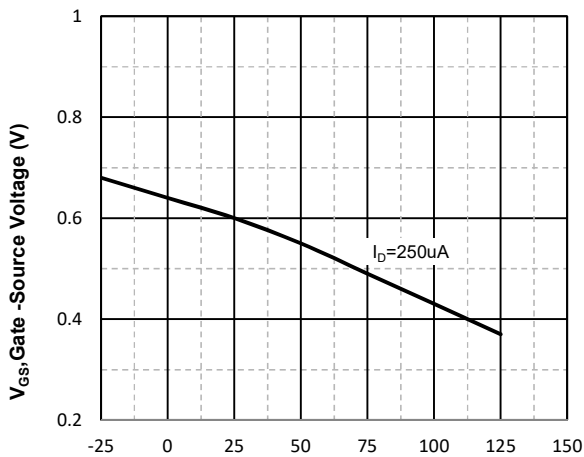
**Typical Operating Characteristics**



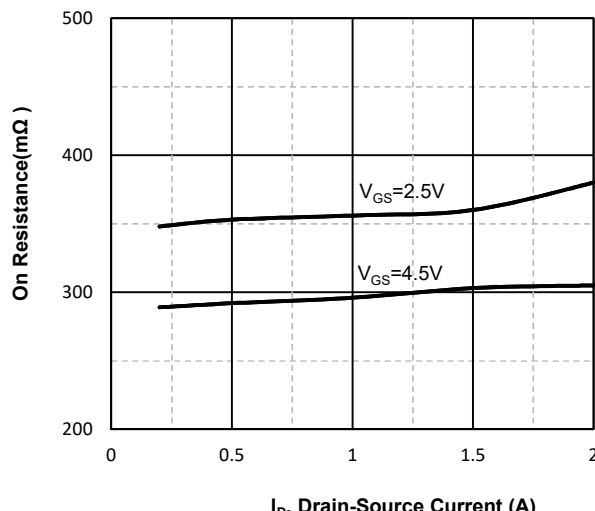
**Fig1. Typical Output Characteristics**



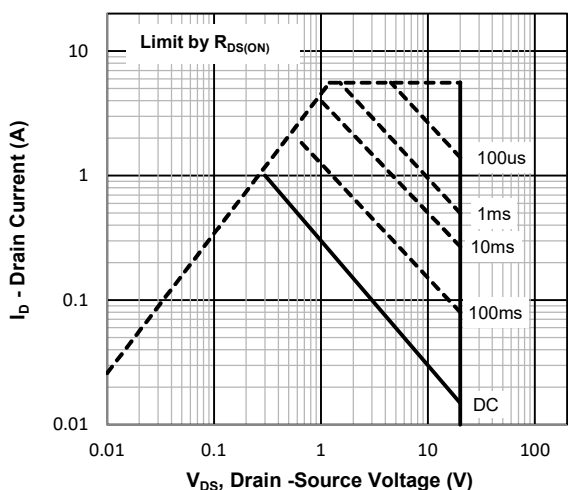
**Fig2. Typical Gate Charge Vs. Gate-Source Voltage**



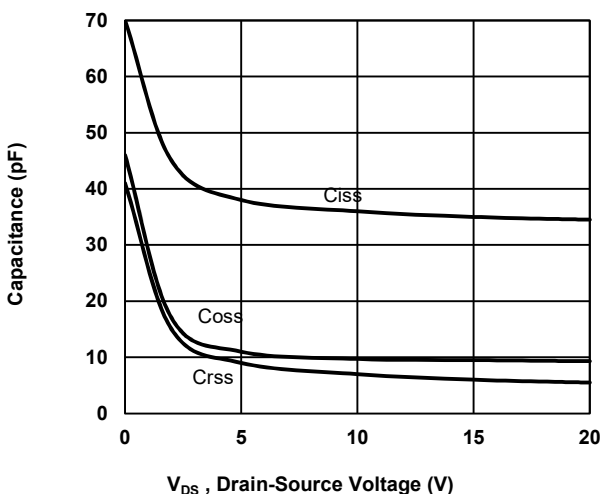
**Fig3. Normalized Threshold Voltage Vs. Temperature**



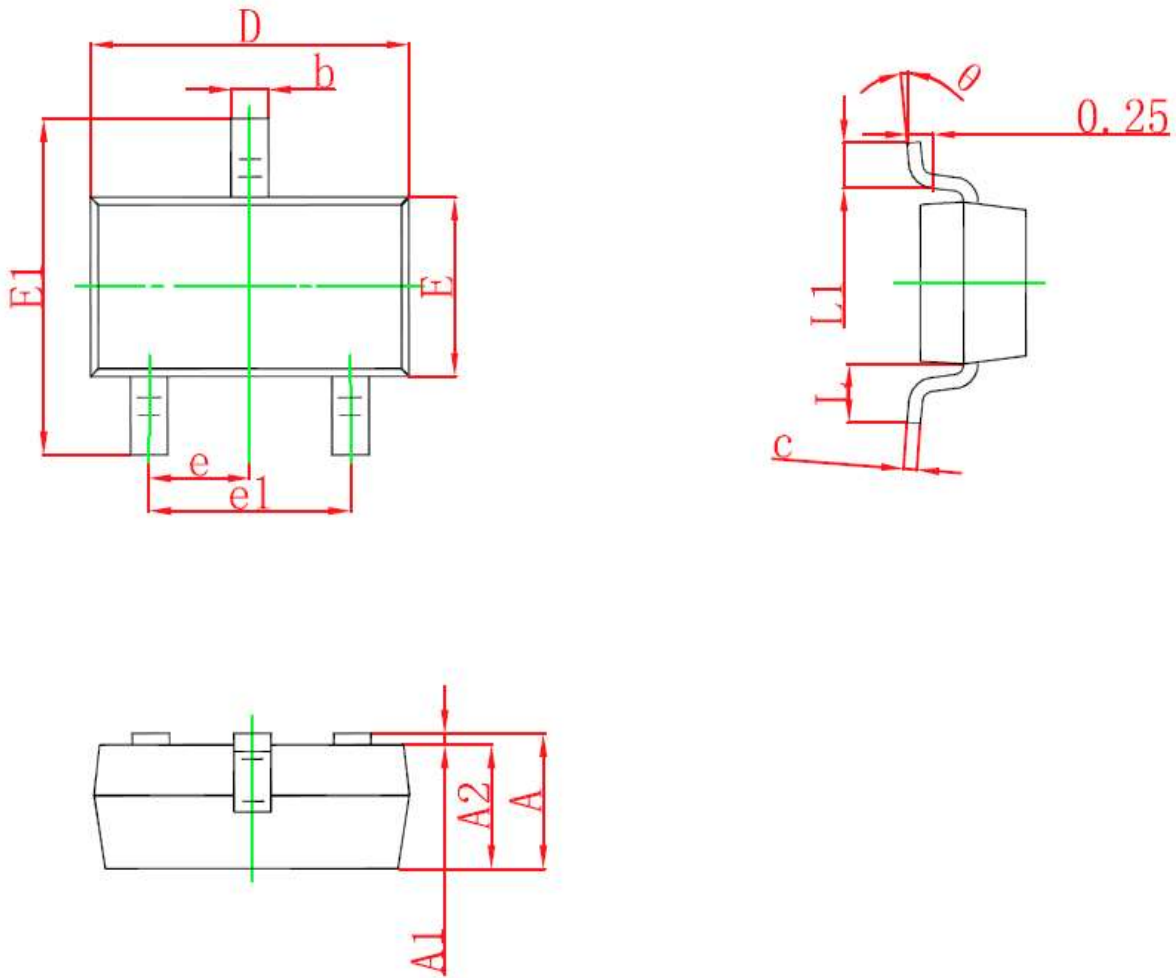
**Fig4. On-Resistance Vs. Drain-Source Current**



**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
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°