

### Features

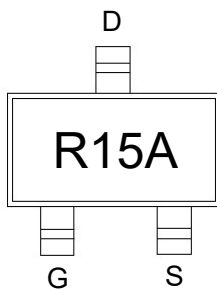
- Trench Power LV MOSFET technology
- High Density Cell Design for Low  $R_{DS(ON)}$
- High Speed switching

### Product Summary

$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
-15V	45mΩ@-4.5V	-5A
	60mΩ@-2.5V	

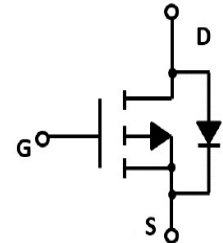
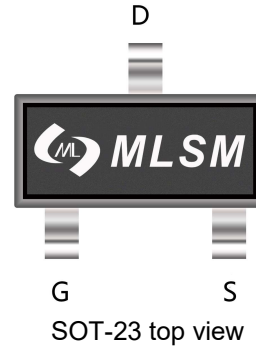
### Application

- Battery protection
- Load switch
- Power management



R15A: Device code

Marking and pin assignment



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	-15	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	$T_c=25^\circ\text{C}$ -5	A

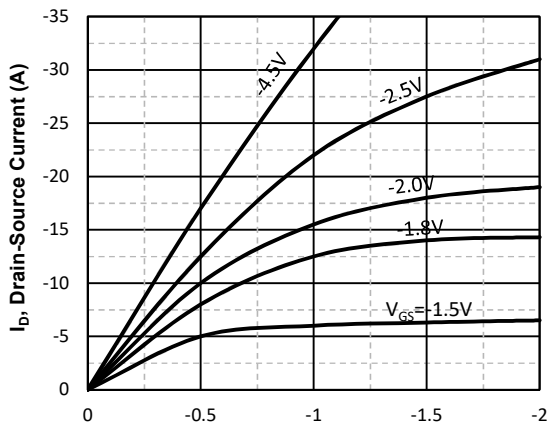
### Mounted on Large Heat Sink

$I_{DM}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ -28	A
$I_D$	Continuous Drain Current	$T_c=25^\circ\text{C}$ -5	A
$P_D$	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 1.2	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	105	°C/W

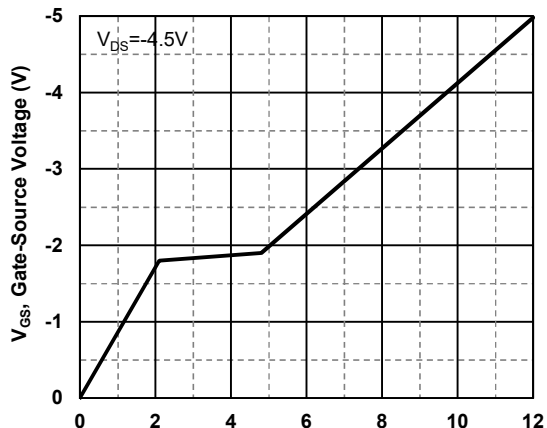
### Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS3415A	SOT-23	R15A	3,000	45,000	180,000	7" reel

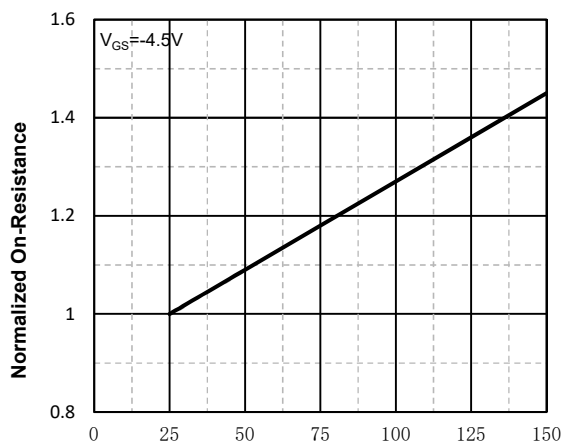
Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
B <sub>V(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-15	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-15V, 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	-0.4	-0.7	-1.0	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A	--	28	45	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A	--	35	60	mΩ
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-1A	--	52	80	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> =-9V, V <sub>GS</sub> =0V, f=1MHz	-	1015	-	pF
C <sub>OSS</sub>	Output Capacitance		-	138	-	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		-	105	-	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-9V, I <sub>D</sub> =-5A, V <sub>GS</sub> =-4.5V	-	11.3	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	2.3	-	nC
Q <sub>gd</sub>	Gate Drain Charge		-	2.4	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =-9V, I <sub>D</sub> =-1A, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =2.5Ω	-	8.5	-	nS
t <sub>r</sub>	Turn-on Rise Time		-	35.5	-	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		-	78	-	nS
t <sub>f</sub>	Turn-Off Fall Time		-	58	-	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =-5A	-	-	-1.2	V

**Typical Operating Characteristics**


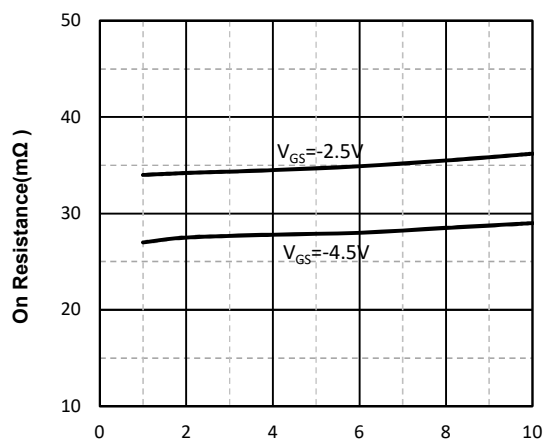
$V_{DS}$ , Drain -Source Voltage (V)  
**Fig1. Typical Output Characteristics**



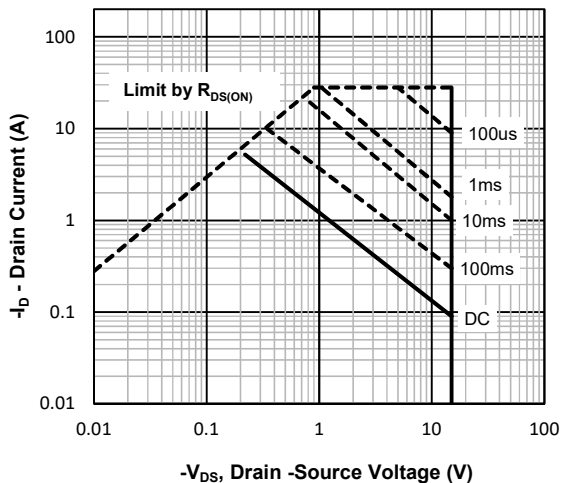
$Q_g$  -Total Gate Charge (nC)  
**Fig2. Typical Gate Charge Vs. Gate-Source Voltage**



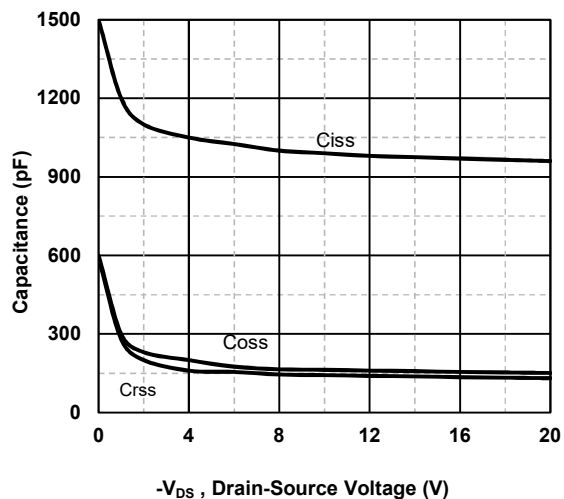
$T_j$  - Junction Temperature (°C)  
**Fig3. Normalized On-Resistance Vs. Temperature**



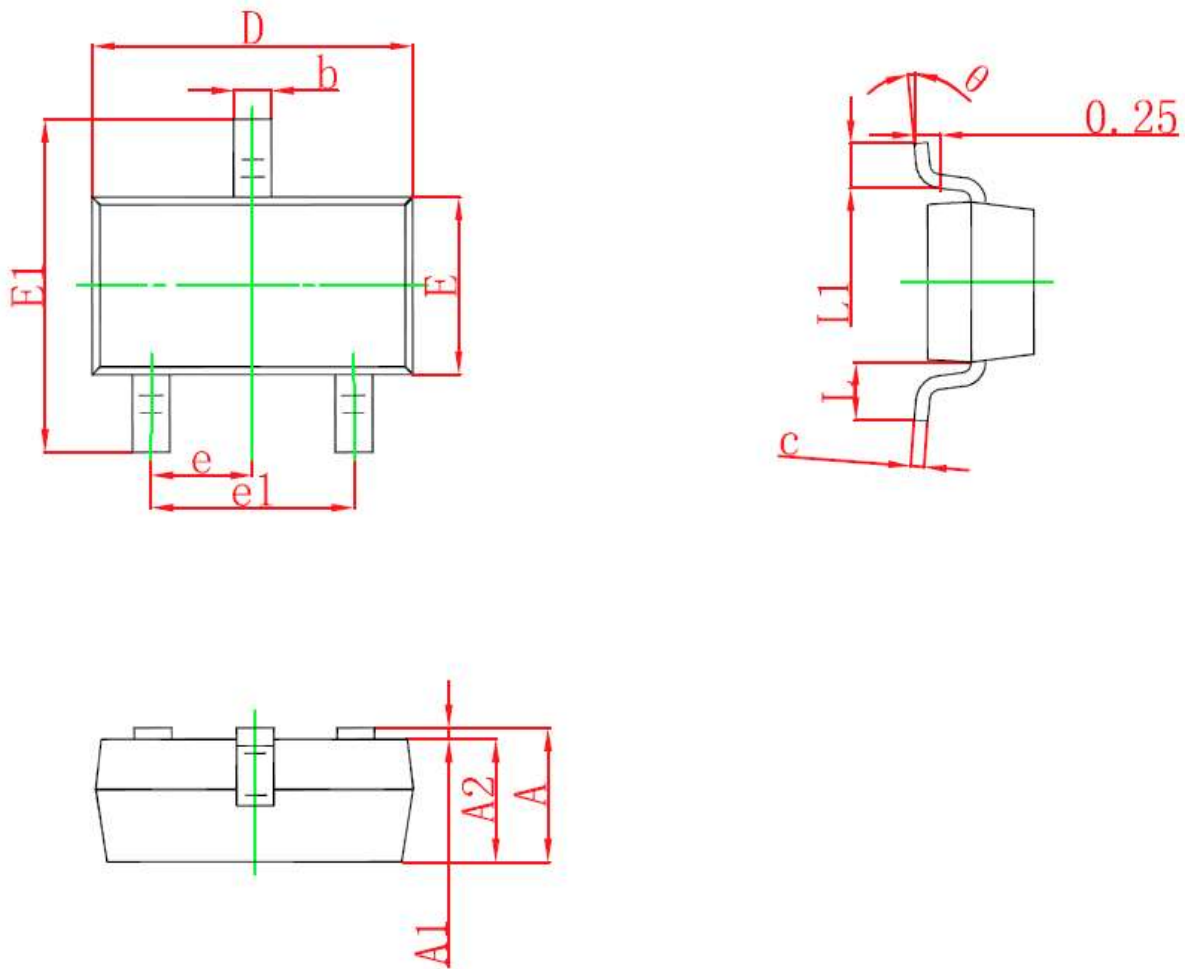
$-I_D$ , Drain-Source Current (A)  
**Fig4. On Resistance Vs. Drain-Source Current**



$-V_{DS}$ , Drain -Source Voltage (V)  
**Fig5. Maximum Safe Operating Area**



$-V_{DS}$ , Drain-Source Voltage (V)  
**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°