

**Features**

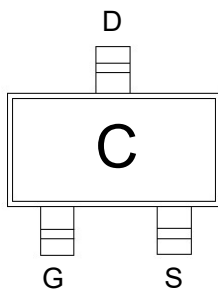
- Low On-Resistance
- Low Threshold
- Fast Switching Speed
- ESD protected up to 2KV

**Application**

- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

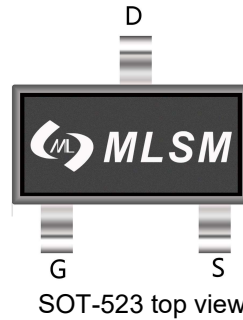
**Product Summary**

$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
20V	700mΩ@4.5V	0.5A
	850mΩ@2.5V	

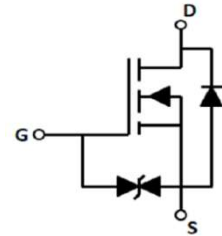


C: Device code

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	±12	V
$T_J$	Maximum Junction Temperature	150	°C
$T_{STG}$	Storage Temperature Range	-50 to 155	°C
$I_S$	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ 0.5	A

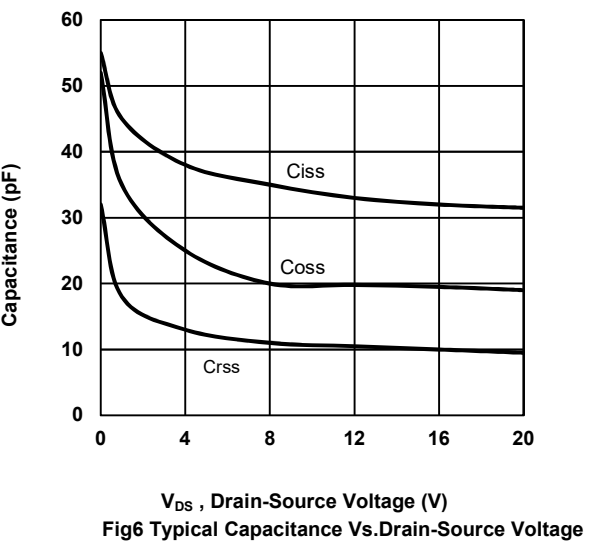
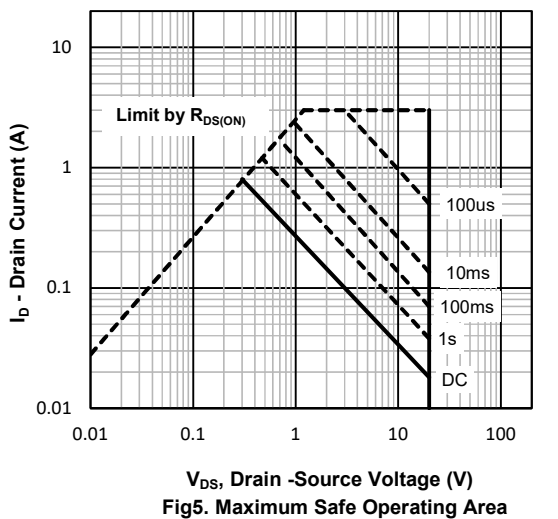
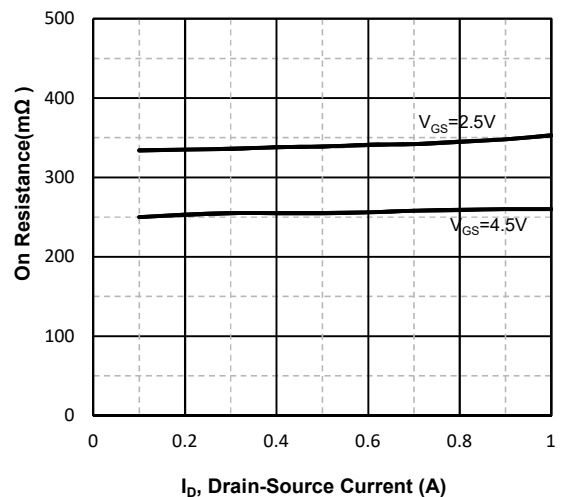
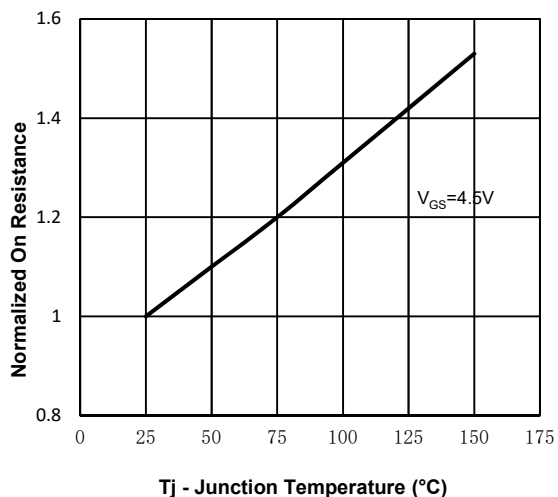
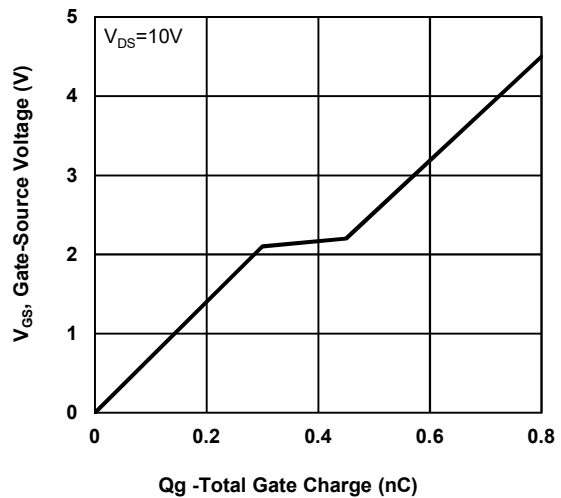
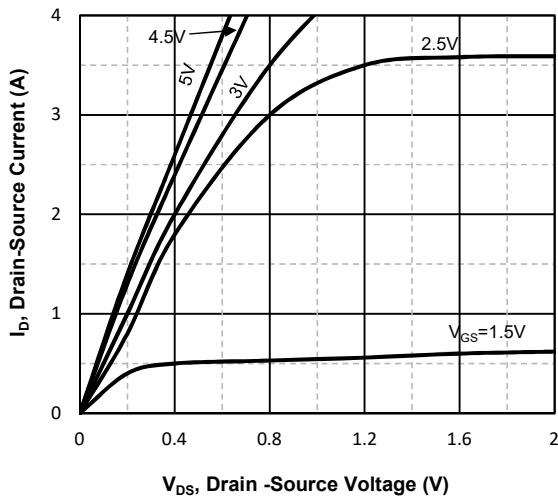
**Mounted on Large Heat Sink**

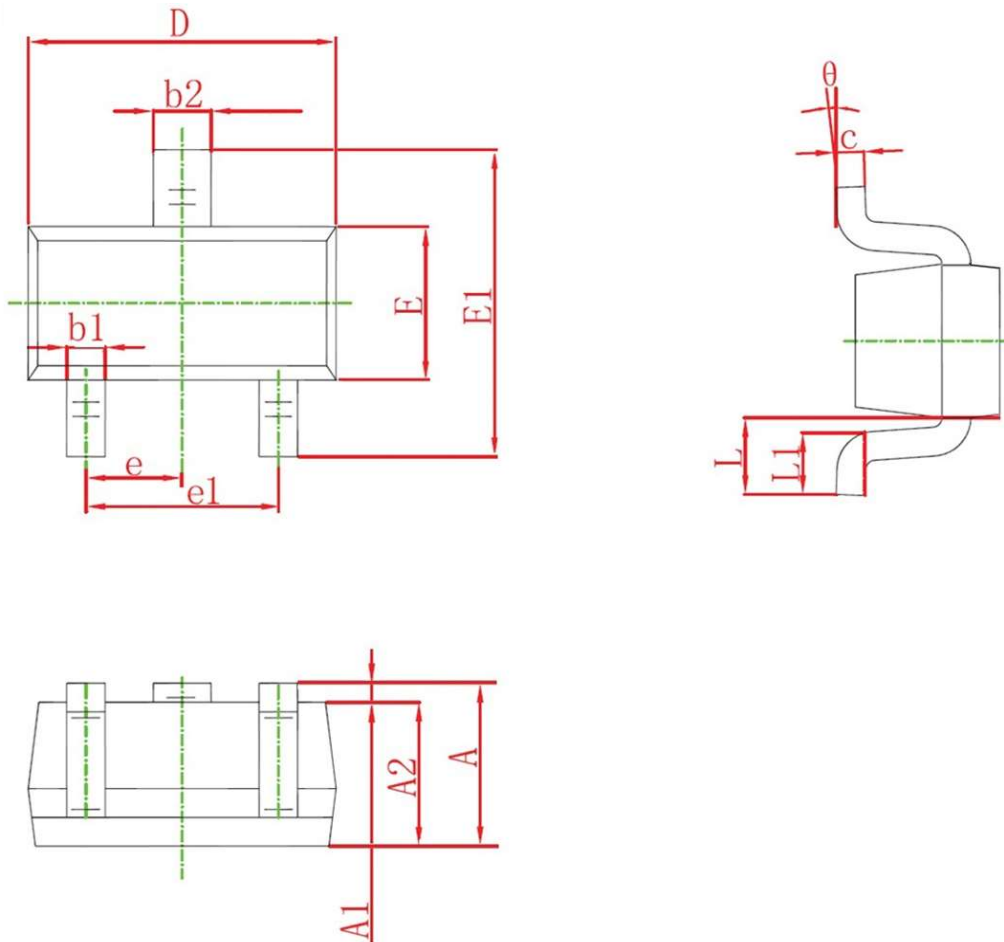
$I_{DM}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ 3	A
$I_D$	Continuous Drain Current	$T_c=25^\circ\text{C}$ 0.5	A
$P_D$	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 0.15	W
$E_{SD}$	Gate-Source ESD Rating (HBM, Method 3015)	2000	V

**Ordering Information (Example)**

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS1012KT	SOT-523	C	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	--	--	±20	μA
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> =0.6A	--	250	700	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.5A	--	330	850	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	--	33	--	pF
C <sub>OSS</sub>	Output Capacitance		--	21	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	10	--	pF
<b>Switching Characteristics</b>						
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		--	0.3	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	0.17	--	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> =10Ω	--	4.2	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	19.1	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	10.3	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	24	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =0.5A	--	--	1.2	V

**Typical Operating Characteristics**


**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°