MLSM MICROELECTRONICS

MLS3139KM

-20V/-0.66A P-Channel MOSFET

Features

- Lead Free Product is Acquired
- Surface Mount Package
- P-Channel Switch with Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive

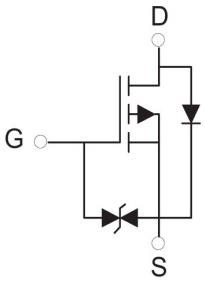
Application

- Load/Power Switching
- Interfacing, Logic Switching
- Battery Management for Ultra Small Portable Electronics

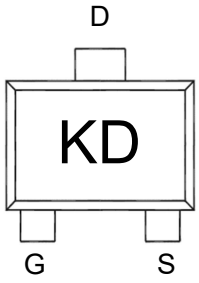
Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
-20V	520mΩ@-4.5V	-0.66A
	700mΩ@-2.5V	

SOT-723 top view



Schematic diagram



KD: Device code

Marking and pin assignment

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings (TA=25℃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		-55 to 150	°C
I_S	Diode Continuous Forward Current	Tc=25°C	-0.66	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	-1.2	A
I_D	Continuous Drain Current	Tc=25°C	-0.66	A
P_D	Maximum Power Dissipation	Tc=25°C	0.15	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient		833	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS3139KM	SOT-723	KD	8,000	120,000	480,000	7"reel

Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	**Parameter**	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$BV_{(BR)DSS}$	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	--	--	±20	μA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.35	-0.65	-1.10	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V, I_D=-1.0A	--	380	520	mΩ
		V_{GS}=-2.5V, I_D=-0.8A	--	520	700	mΩ
		V_{GS}=-1.8V, I_D=-0.5A	--	750	--	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	--	71	--	pF
C_{OSS}	Output Capacitance		--	20	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	15	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DD}=-10V, I_D=-0.5A, V_{GS}=-4.5V	--	1.25	--	nC
Q_{gs}	Gate Source Charge		--	0.35	--	nC
Q_{gd}	Gate Drain Charge		--	0.29	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-10V, I_D=-0.2A, V_{GS}=-4.5V, R_G=3Ω	--	4	--	nS
t_r	Turn-on Rise Time		--	19	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	16	--	nS
t_f	Turn-Off Fall Time		--	25	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃, Is=-0.66A	--	--	-1.2	V

Typical Operating Characteristics

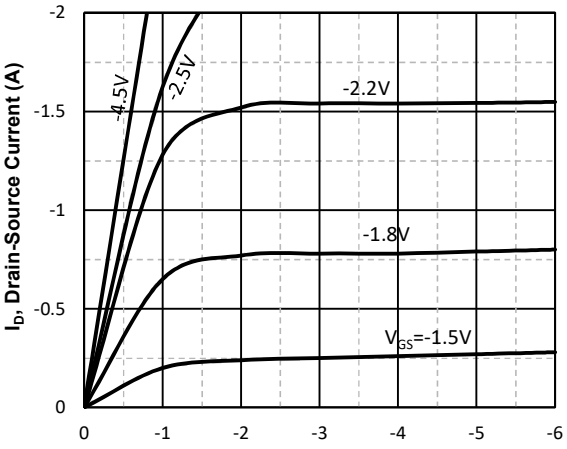


Fig1. Typical Output Characteristics

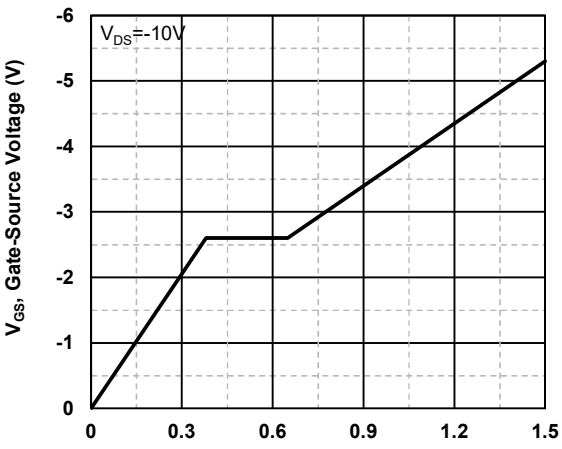


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

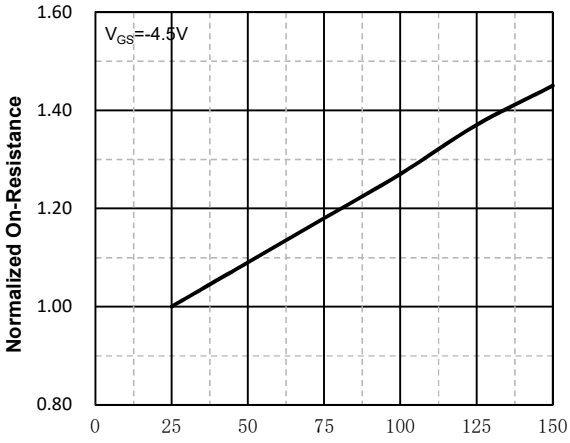


Fig3. Normalized On-Resistance Vs. Temperature

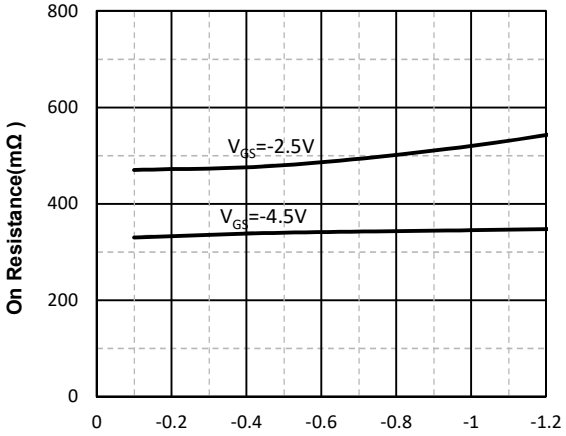


Fig4. On Resistance Vs. Drain-Source Current

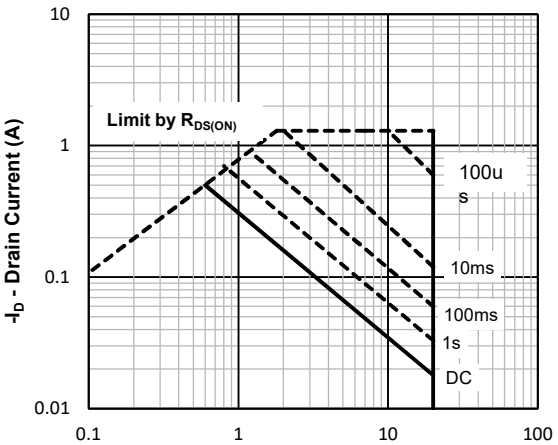


Fig5. Maximum Safe Operating Area

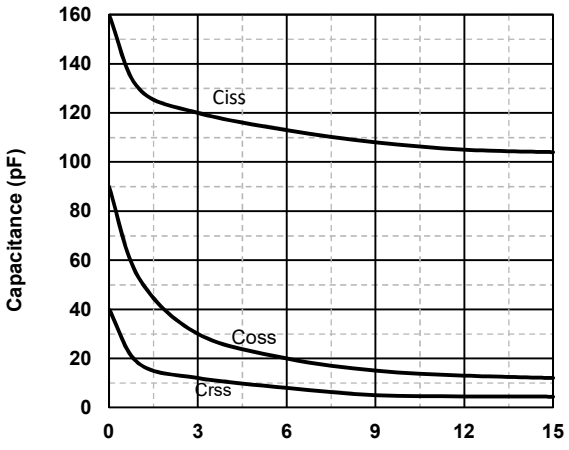
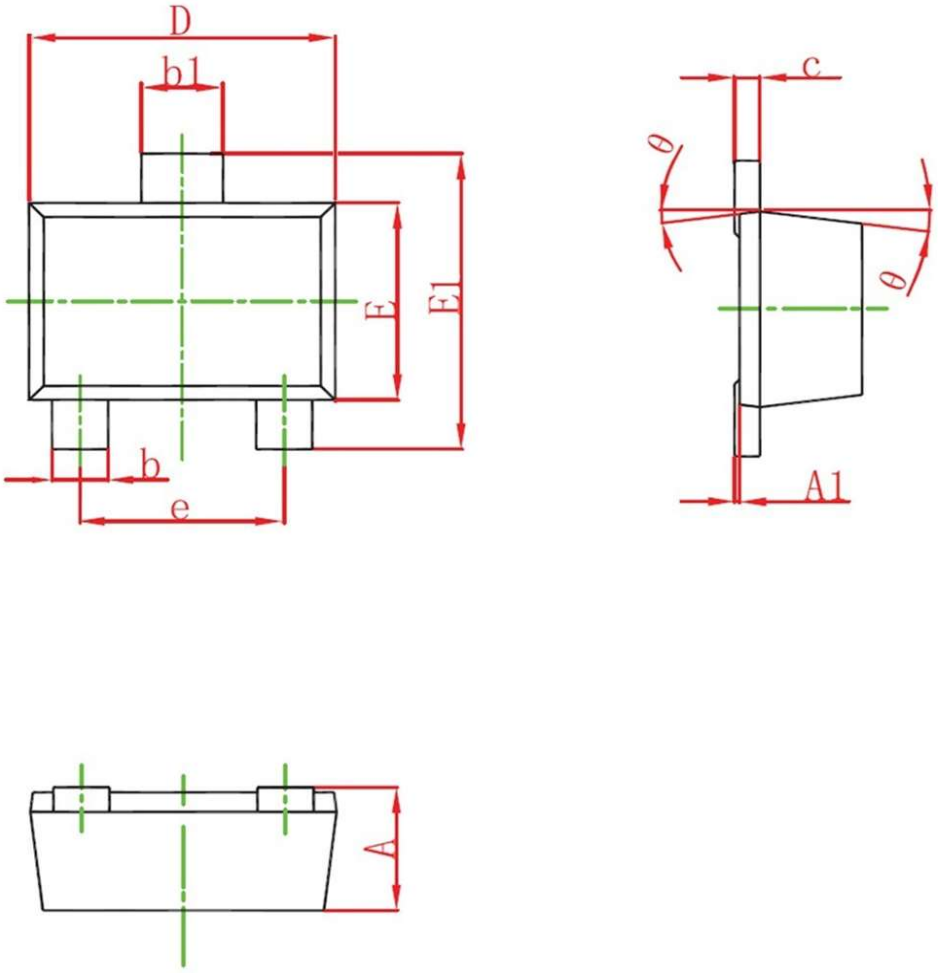


Fig6 Typical Capacitance Vs.Drain-Source Voltage

SOT-723 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.320	0.400	0.012	0.016
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.006	0.010
b1	0.270	0.370	0.010	0.014
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.046	0.050
E	0.750	0.850	0.030	0.034
E1	1.150	1.250	0.046	0.050
e	0.800TYP		0.020TYP	
θ	7°REF		7°REF	