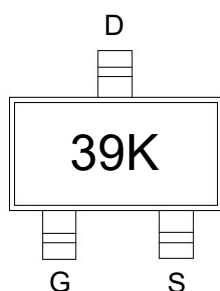


Features

- 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

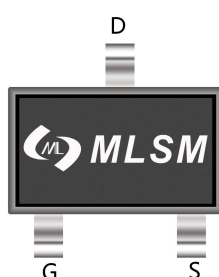


39K: Device code

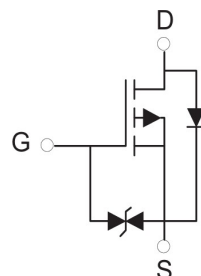
Marking and pin assignment

Product Summary

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



SOT-323 top view



Schematic diagram



Pb-Free



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		-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	$T_c=25^\circ\text{C}$	-2.64	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	-0.66	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	0.2	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient		625	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS3139KW	SOT-323	39K	3,000	45,000	180,000	7"reel

Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 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	--	--	±10	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 @ T _J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	--	115	--	pF
C _{OSS}	Output Capacitance		--	15	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	8.8	--	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 =10Ω	--	9	--	nS
t _r	Turn-on Rise Time		--	5.5	--	nS
t _{d(off)}	Turn-Off Delay Time		--	30.8	--	nS
t _f	Turn-Off Fall Time		--	20	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =-0.66A	--	--	-1.2	V

Typical Operating Characteristics

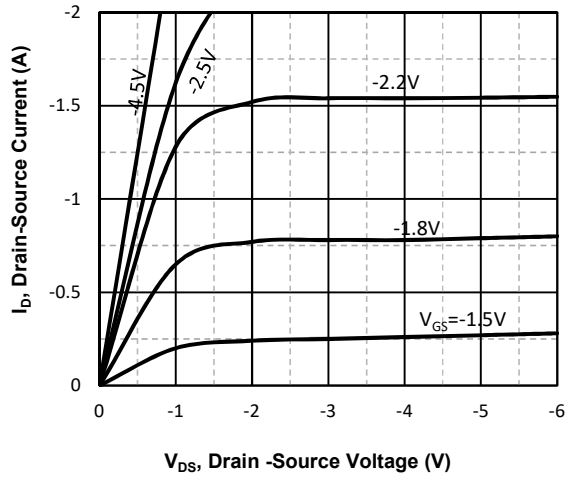


Fig1. Typical Output Characteristics

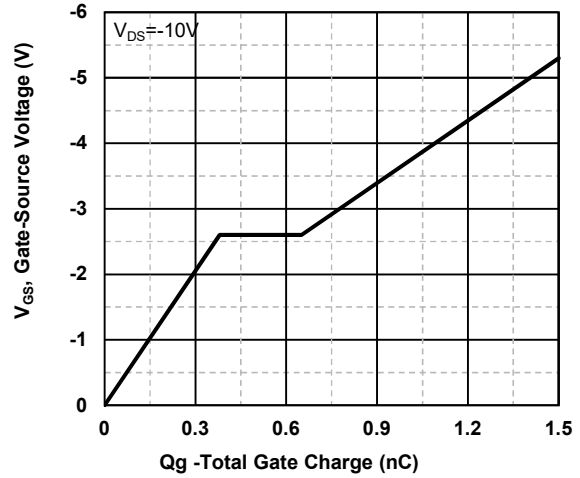


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

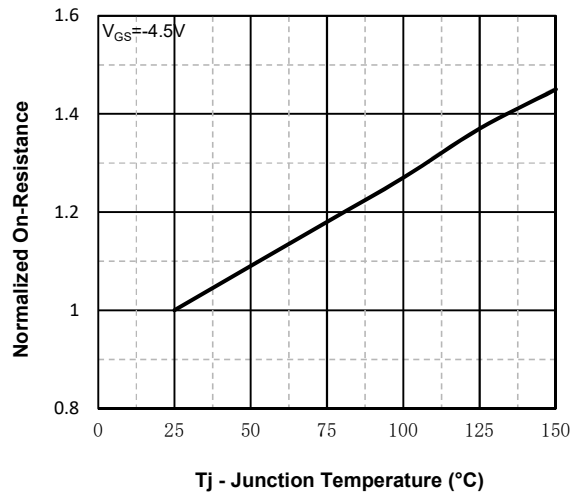


Fig3. Normalized On-Resistance Vs. Temperature

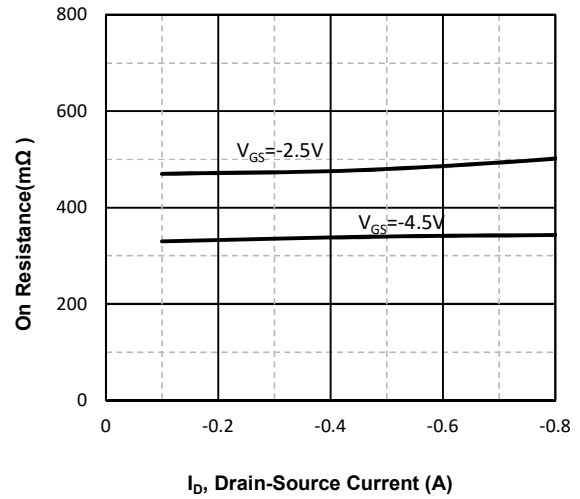


Fig4. On Resistance Vs. Drain-Source Current

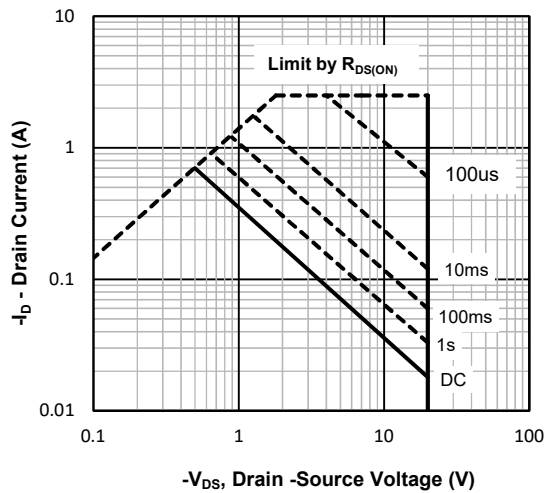


Fig5. Maximum Safe Operating Area

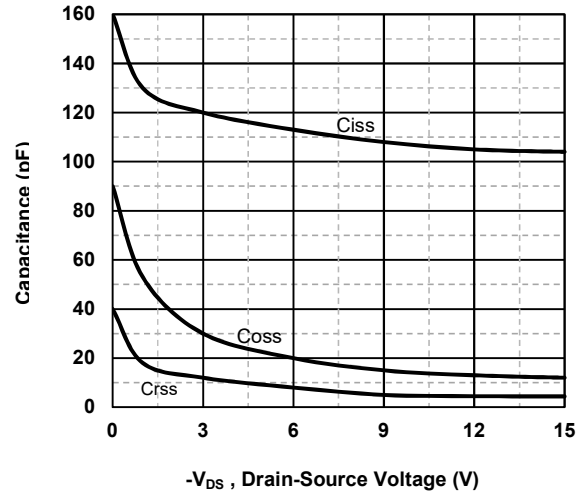
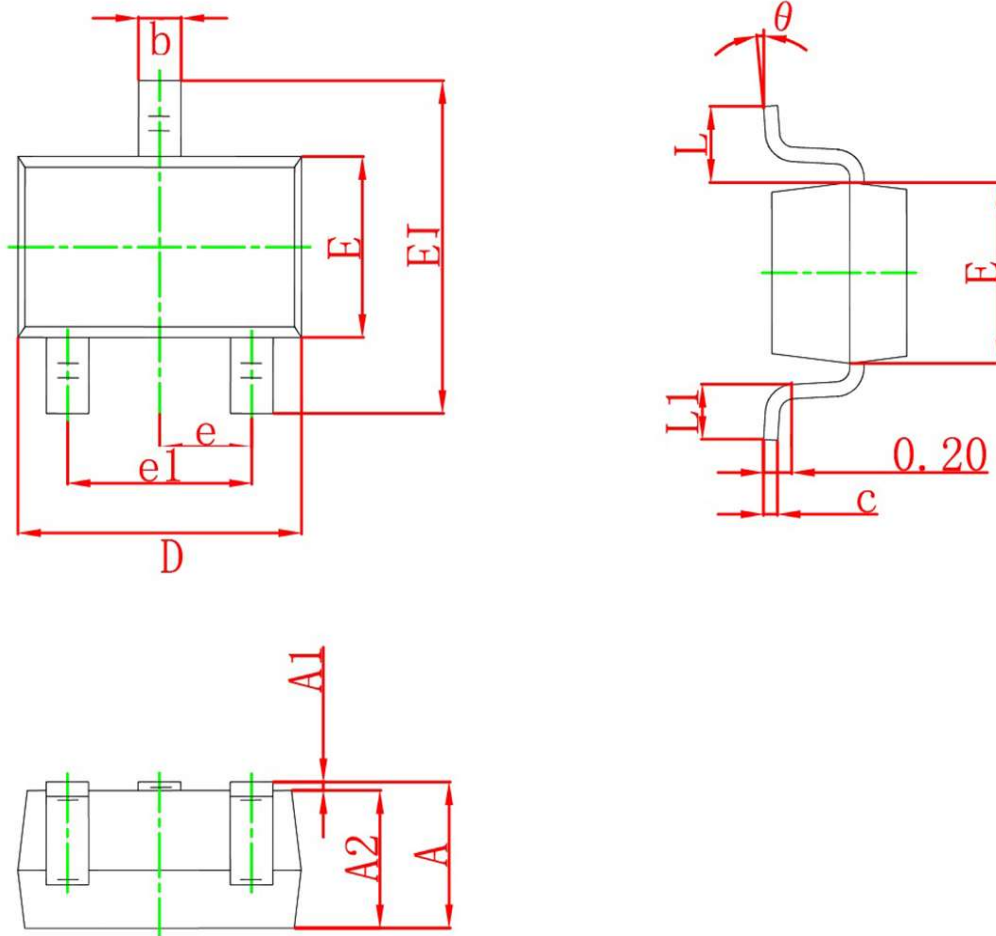


Fig6 Typical Capacitance Vs. Drain-Source Voltage

SOT-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
θ	0°	8°	0°	8°