

Features

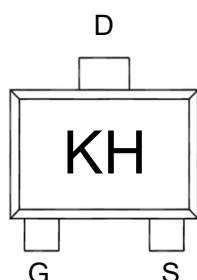
- Energy efficient
- Miniature surface mount package saves board space
- ESD With protection diode between gate and source

Product Summary

V_{DS}	$R_{DS(ON)} \text{ MAX}$	$I_D \text{ MAX}$
-50V	8Ω@-10V	-0.18A
	10Ω@-5V	

Application

- High-speed line driver、Relay driver
- High-side load switch and Switching circuits

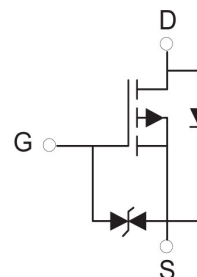


KH: Device code

Marking and pin assignment



SOT-723 top view



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		-50	V
V _{GS}	Gate-Source Voltage		±20	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-50 to 155	°C
I _S	Diode Continuous Forward Current	Tc=25°C	-0.18	A

Mounted on Large Heat Sink

I _{DM}	Pulse Drain Current Tested	Tc=25°C	-0.7	A
I _D	Continuous Drain Current	Tc=25°C	-0.18	A
P _D	Maximum Power Dissipation	Tc=25°C	0.15	W
R _{θJA}	Thermal Resistance Junction-to-Ambient		833	°C/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
MLS502KM	SOT-723	KH	8,000	12,000	480,000	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	-50	–	–	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-50V, V _{GS} =0V	–	–	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	–	–	±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.4	-2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-0.18A	–	4.1	8	Ω
		V _{GS} =-5V, I _D =-0.15A	–	5.5	10	Ω
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	–	43	–	pF
C _{OSS}	Output Capacitance		–	2.9	–	pF
C _{RSS}	Reverse Transfer Capacitance		–	1.8	–	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-0.18A, V _{GS} =-4.5V	–	9.5	–	nC
Q _{gs}	Gate Source Charge		–	1.1	–	nC
Q _{gd}	Gate Drain Charge		–	2	–	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =-10V, R _L =2.5Ω, V _{GS} =-4.5V, R _G =2.8Ω	–	12.8	–	nS
t _r	Turn-on Rise Time		–	8.9	–	nS
t _{d(off)}	Turn-Off Delay Time		–	18.8	–	nS
t _f	Turn-Off Fall Time		–	30	–	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =-0.18A	–	–	-1.2	V

Typical Operating Characteristics

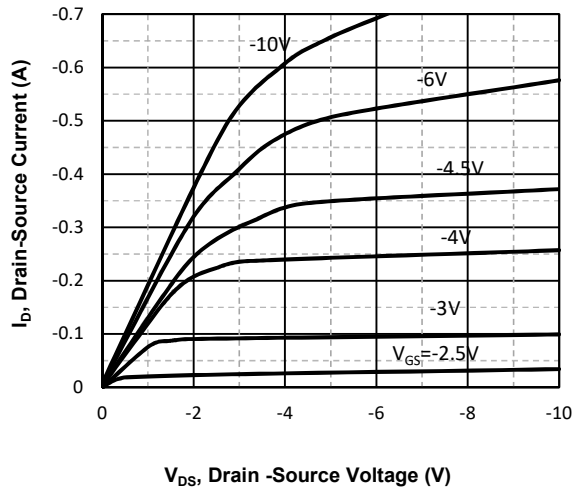


Fig1. Typical Output Characteristics

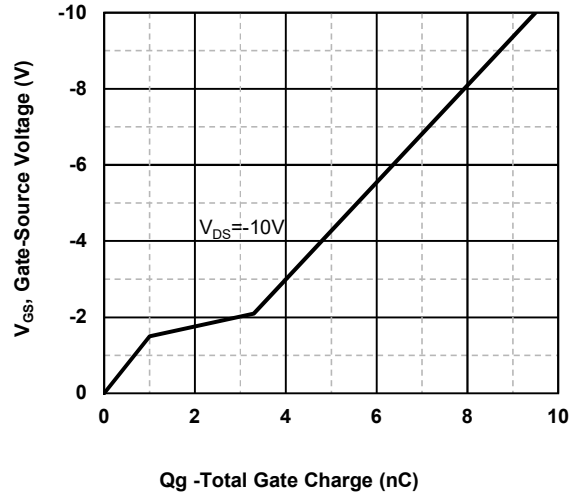


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

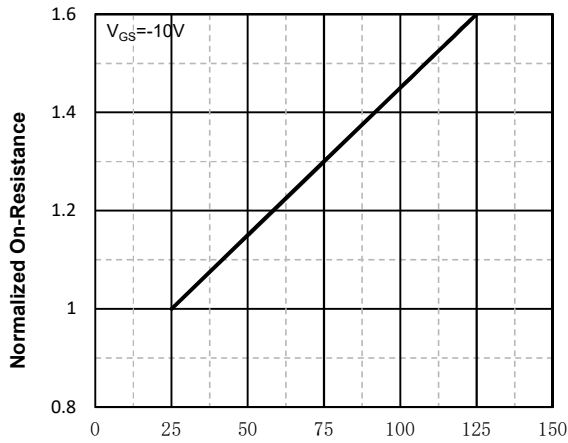


Fig3. Normalized On-Resistance Vs. Temperature

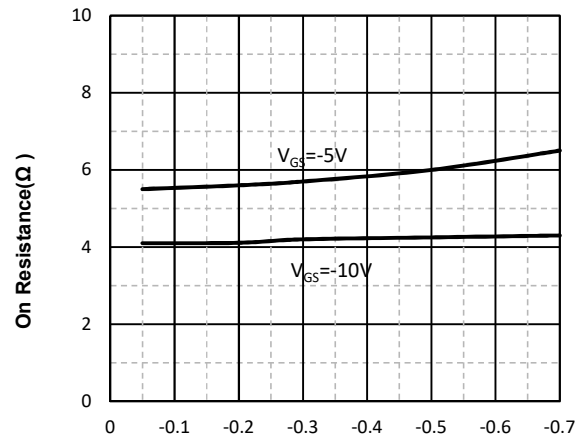


Fig4. On Resistance Vs. Drain-Source Current

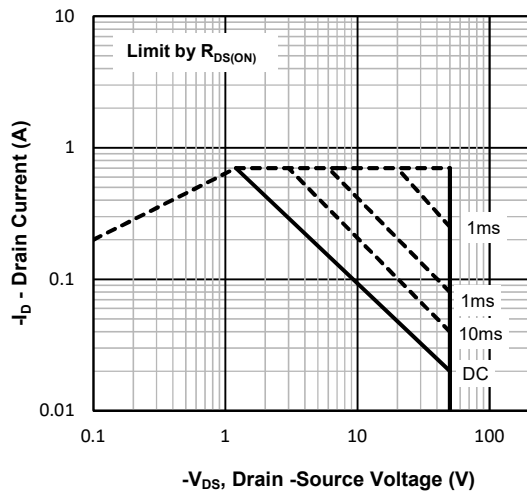


Fig5. Maximum Safe Operating Area

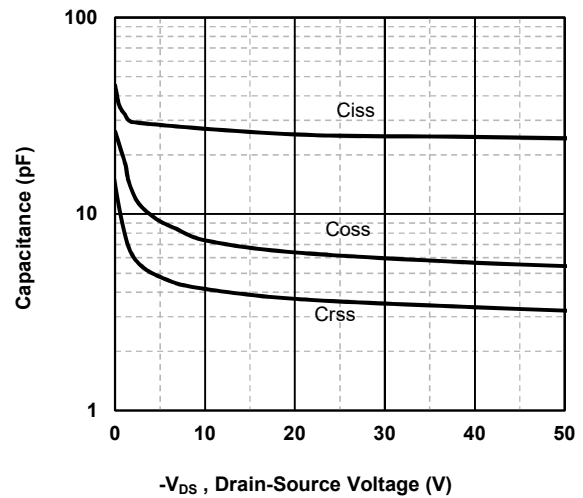
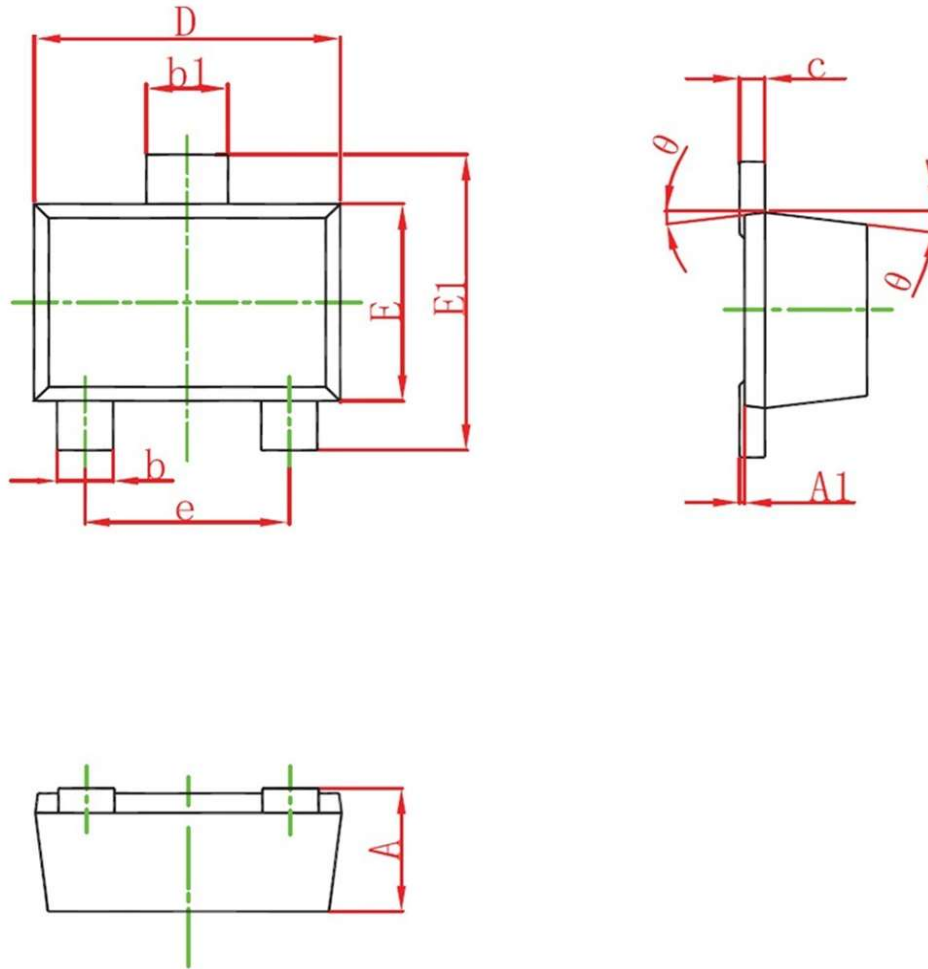


Fig6 Typical Capacitance Vs. Drain-Source Voltage

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	