

Features

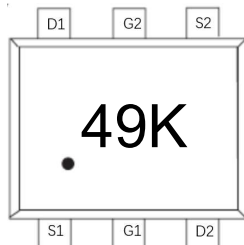
- Surface Mount Package
- Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- ESD Protected Gate

Application

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

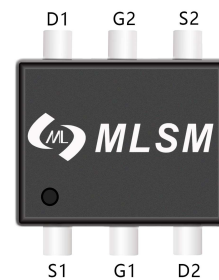
Product Summary

V_{DS}	$R_{DS(on)}$ MAX	I_D MAX
20V	380mΩ@4.5V	0.75A
	450mΩ@2.5V	
-20V	520mΩ@-4.5V	-0.66A
	700mΩ@-2.5V	

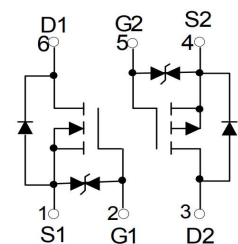


49K: Device code

Marking and pin assignment



SOT-563 top view



Schematic diagram



Pb-Free



Halogen-Free

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Unit
V_{DS}	Drain-Source Breakdown Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	±12	±12	V
T_J	Maximum Junction Temperature	150	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ 0.75	-0.66	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ 1.8	-1.2	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$ 0.75	-0.66	A
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	883	883	°C/W
E_{SD}	Gate-Source ESD Rating (HBM, Method 3015)	2000	-2000	V

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSX3439K	SOT-563	49K	3,000	45,000	180,000	7" reel

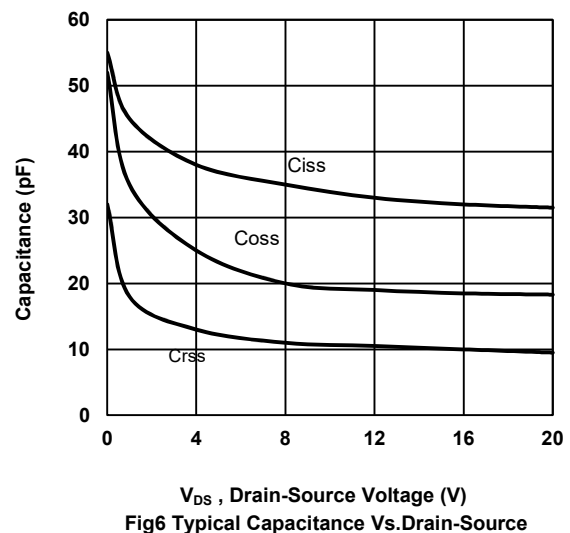
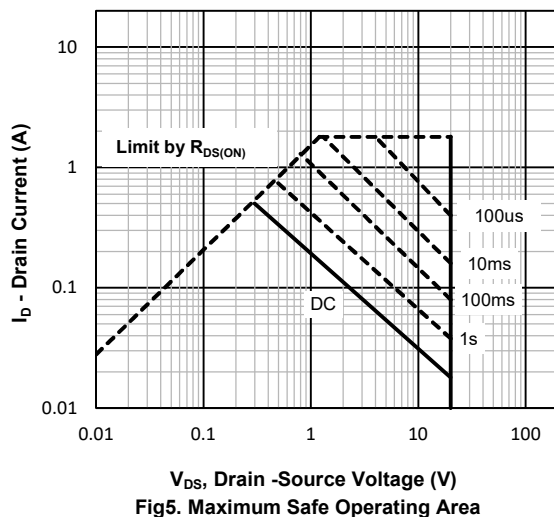
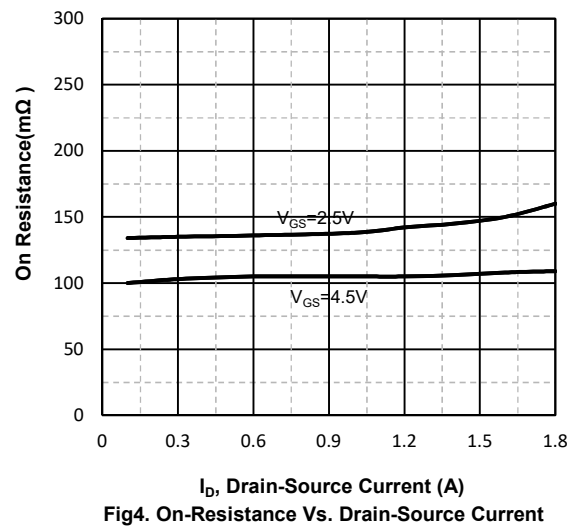
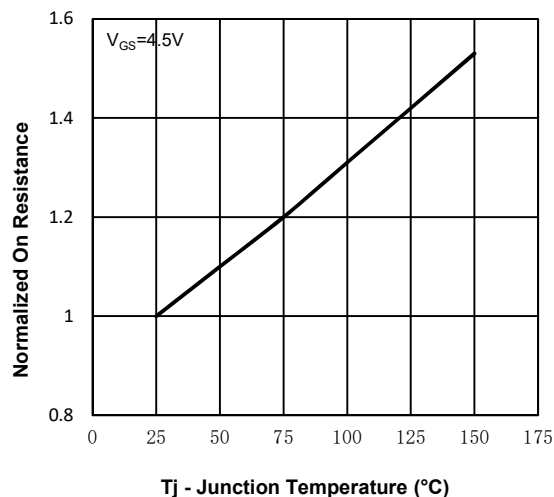
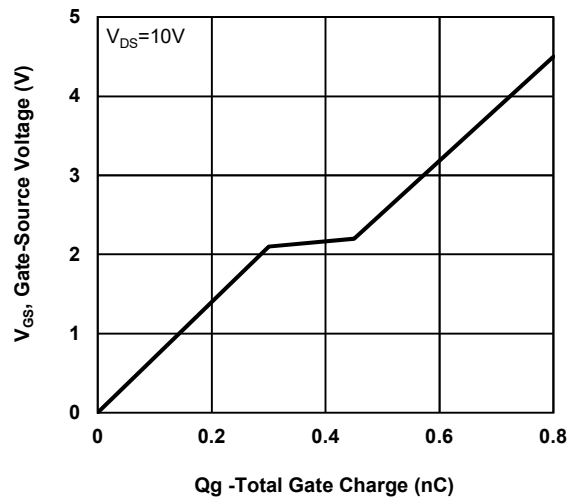
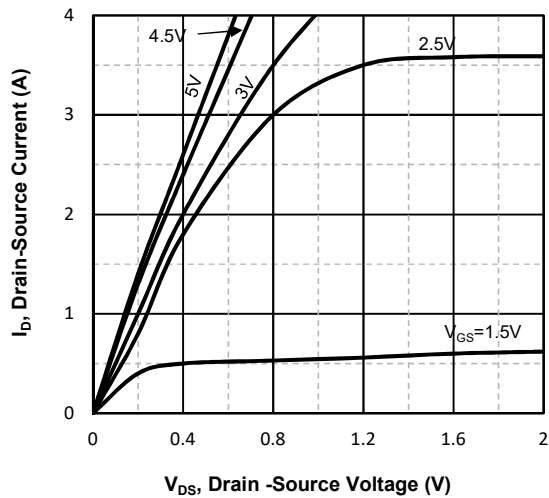


N-Ch Electrical Characteristics (TJ=25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	--	--	V
I _{DSS}	Zero Gate Voltage 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	0.7	1.1	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =0.65A	--	100	380	mΩ
		V _{GS} =2.5V, I _D =0.55A	--	135	450	mΩ
		V _{GS} =1.8V, I _D =0.45A	--	200	800	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	--	33	--	pF
C _{OSS}	Output Capacitance		--	21	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	10	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =10V, I _D =0.75A, V _{GS} =4.5V	--	0.8	--	nC
Q _{gs}	Gate Source Charge		--	0.3	--	nC
Q _{gd}	Gate Drain Charge		--	0.17	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V, I _D =0.75A, V _{GS} =4.5V, R _G =10Ω	--	4.2	--	nS
t _r	Turn-on Rise Time		--	19.1	--	nS
t _{d(off)}	Turn-Off Delay Time		--	10.3	--	nS
t _f	Turn-Off Fall Time		--	24	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	TJ=25°C, Is=0.75A	--	--	1.2	V

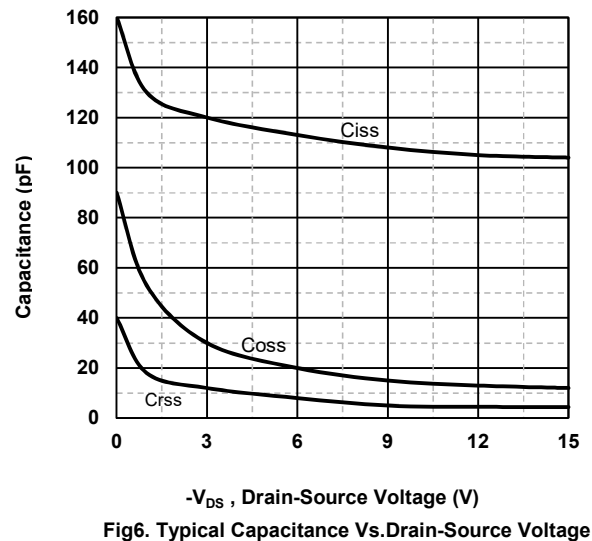
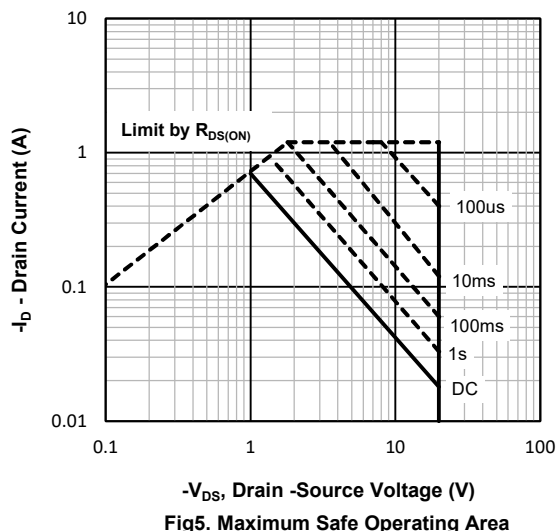
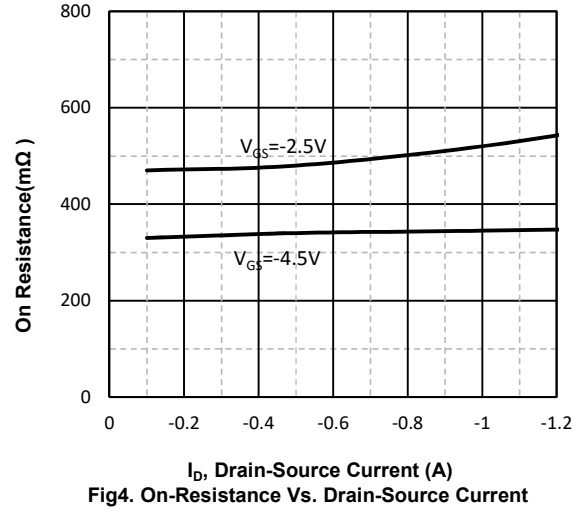
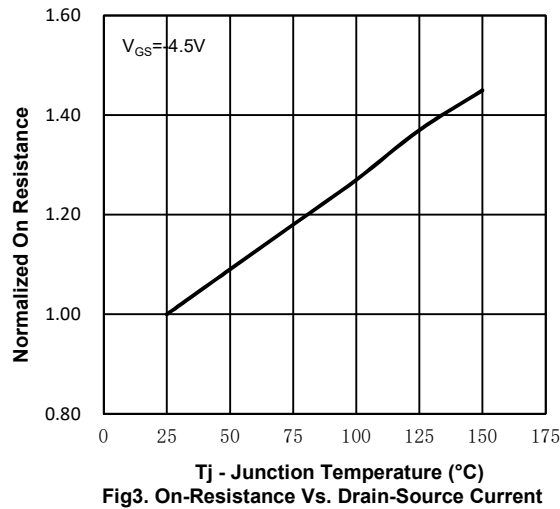
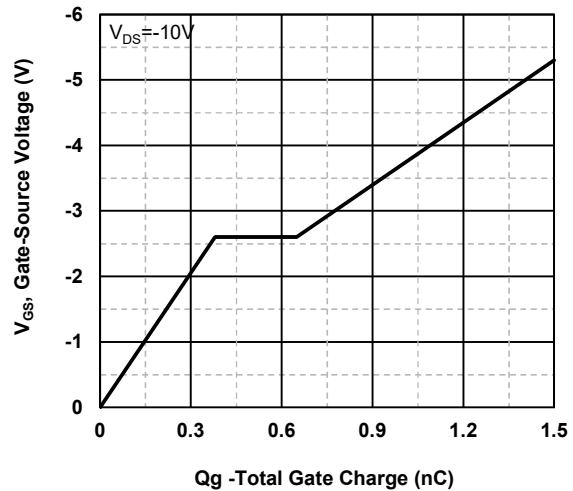
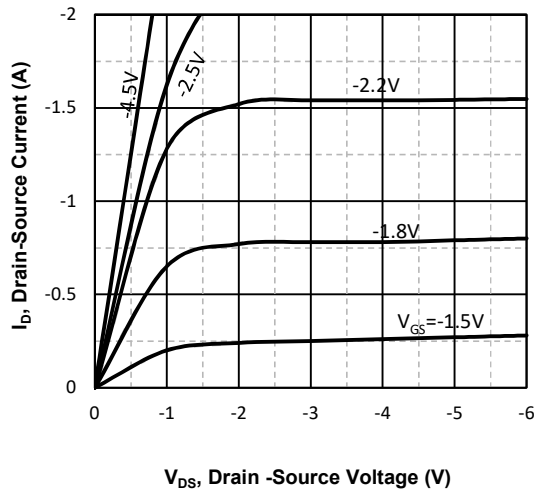


P-Ch Electrical Characteristics (TJ=25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage 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	-1.1	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	--	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 =-0.66A, 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 =-0.66A, 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	TJ=25°C, I _S =-0.66A	--	--	-1.2	V

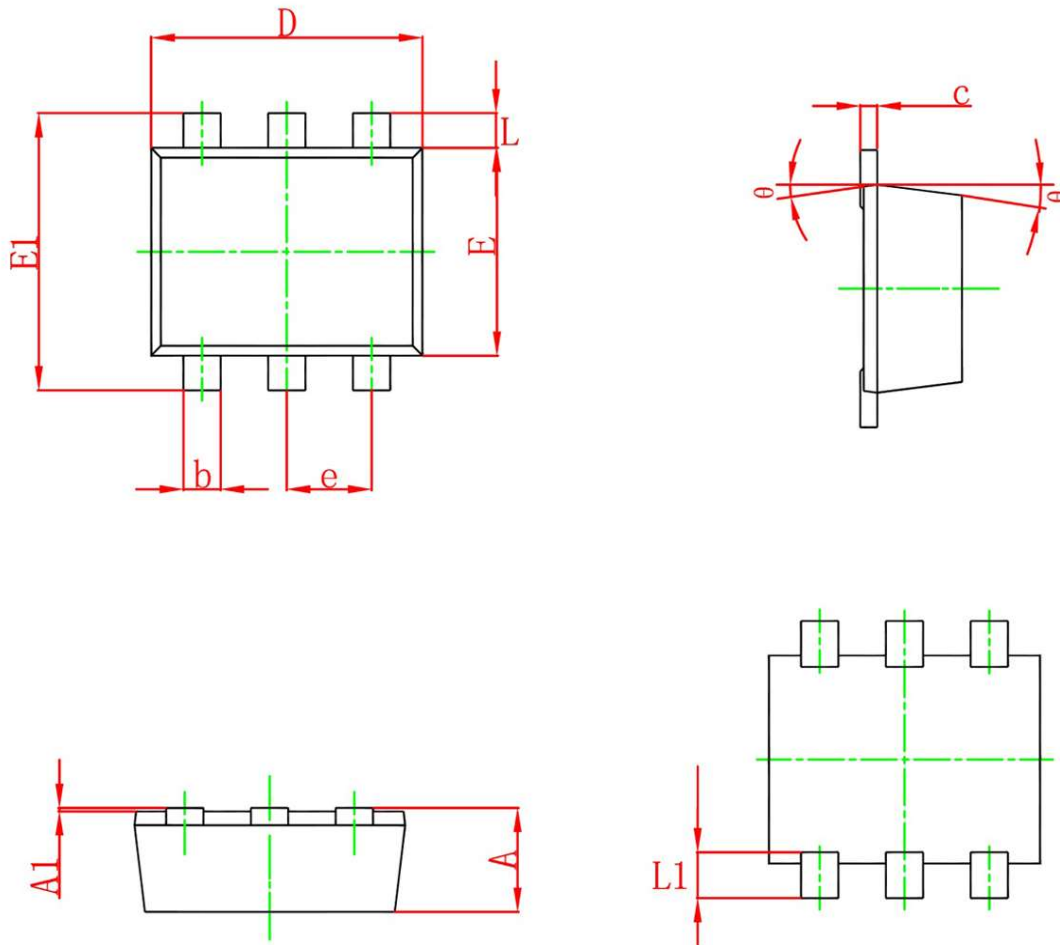
N-Ch Typical Operating Characteristics



P-Ch Typical Operating Characteristics



SOT-563 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
e	0.450	0.550	0.018	0.022
c	0.090	0.180	0.004	0.007
D	1.500	1.700	0.059	0.067
b	0.170	0.270	0.007	0.011
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
L	0.100	0.300	0.004	0.012
L1	0.200	0.400	0.008	0.016
θ	10° REF.		10° REF.	