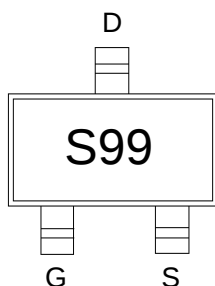


Features

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Application

- Battery protection
- Load switch
- Power management

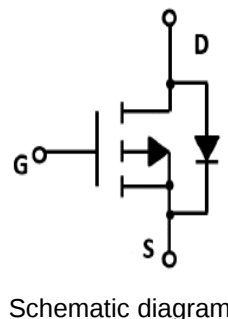
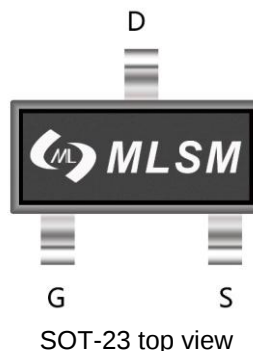


S99: Device code

Marking and pin assignment

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
-20V	28mΩ@-10V	-6A
	37mΩ@-4.5V	



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	Tc=25°C	-6	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	Tc=25°C	-25	A
I_D	Continuous Drain Current	Tc=25°C	-6	A
P_D	Maximum Power Dissipation	Tc=25°C	2.5	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		100	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS2399	SOT-23	S99	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 @ 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	--	--	-1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.6	--	-1.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-6A	--	28	34	mΩ
		V _{GS} =-4.5V, I _D =-3A	--	37	45	mΩ
		V _{GS} =-2.5V, I _D =-1A	--	55	67	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	--	1600	--	pF
C _{OSS}	Output Capacitance		--	350	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	300	--	pF
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-5.1A, V _{GS} =-2.5V	--	6.5	--	nC
Q _{gs}	Gate Source Charge		--	1.9	--	nC
Q _{gd}	Gate Drain Charge		--	3.5	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, I _D =-4.1A, V _{GEN} =-4.5V, R _G =1Ω	--	23	--	nS
t _r	Turn-on Rise Time		--	22	--	nS
t _{d(off)}	Turn-Off Delay Time		--	30	--	nS
t _f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =-6A	--	--	-1.2	V

Typical Operating Characteristics

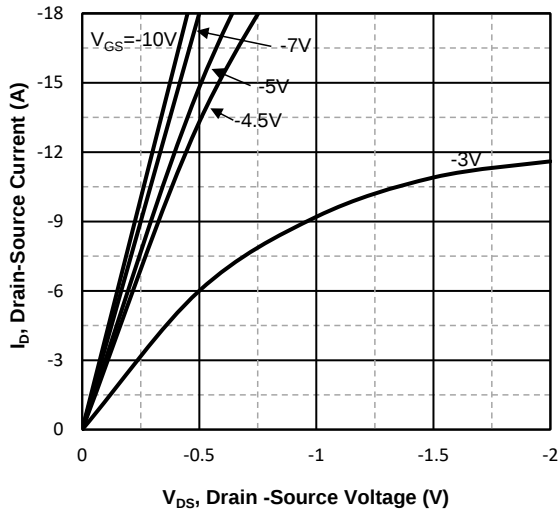


Fig1. Typical Output Characteristics

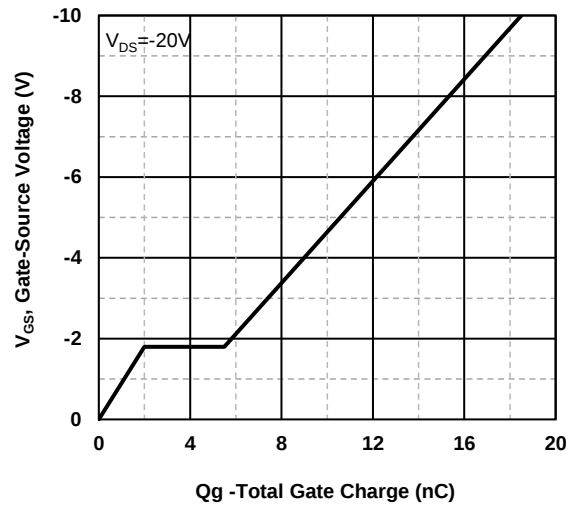


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

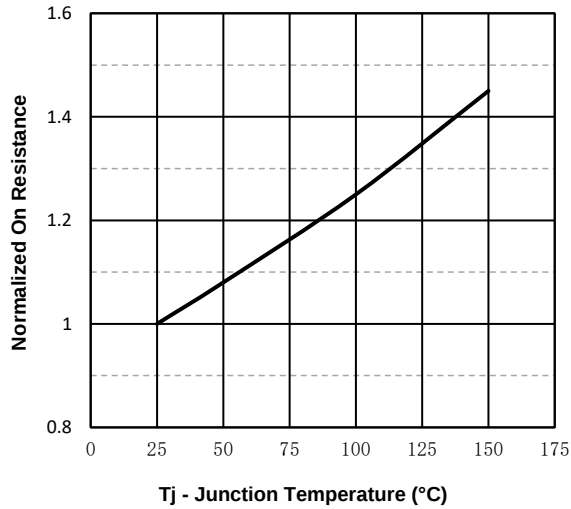


Fig3. Normalized On-Resistance Vs. Temperature

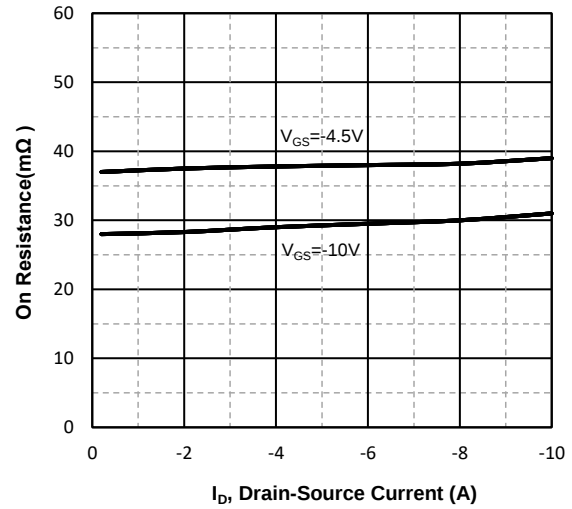


Fig4. On-Resistance Vs. Drain-Source Current

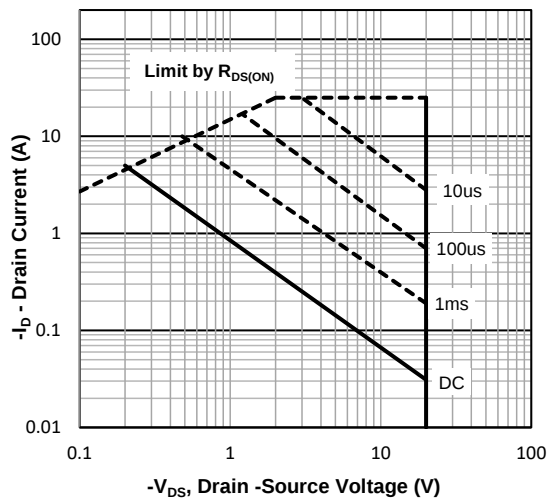


Fig5. Maximum Safe Operating Area

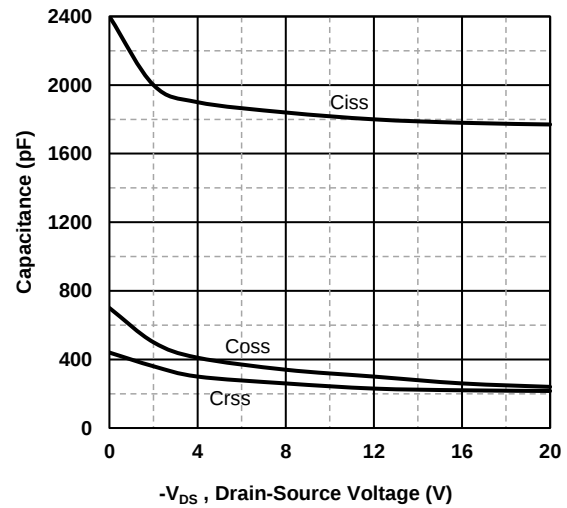
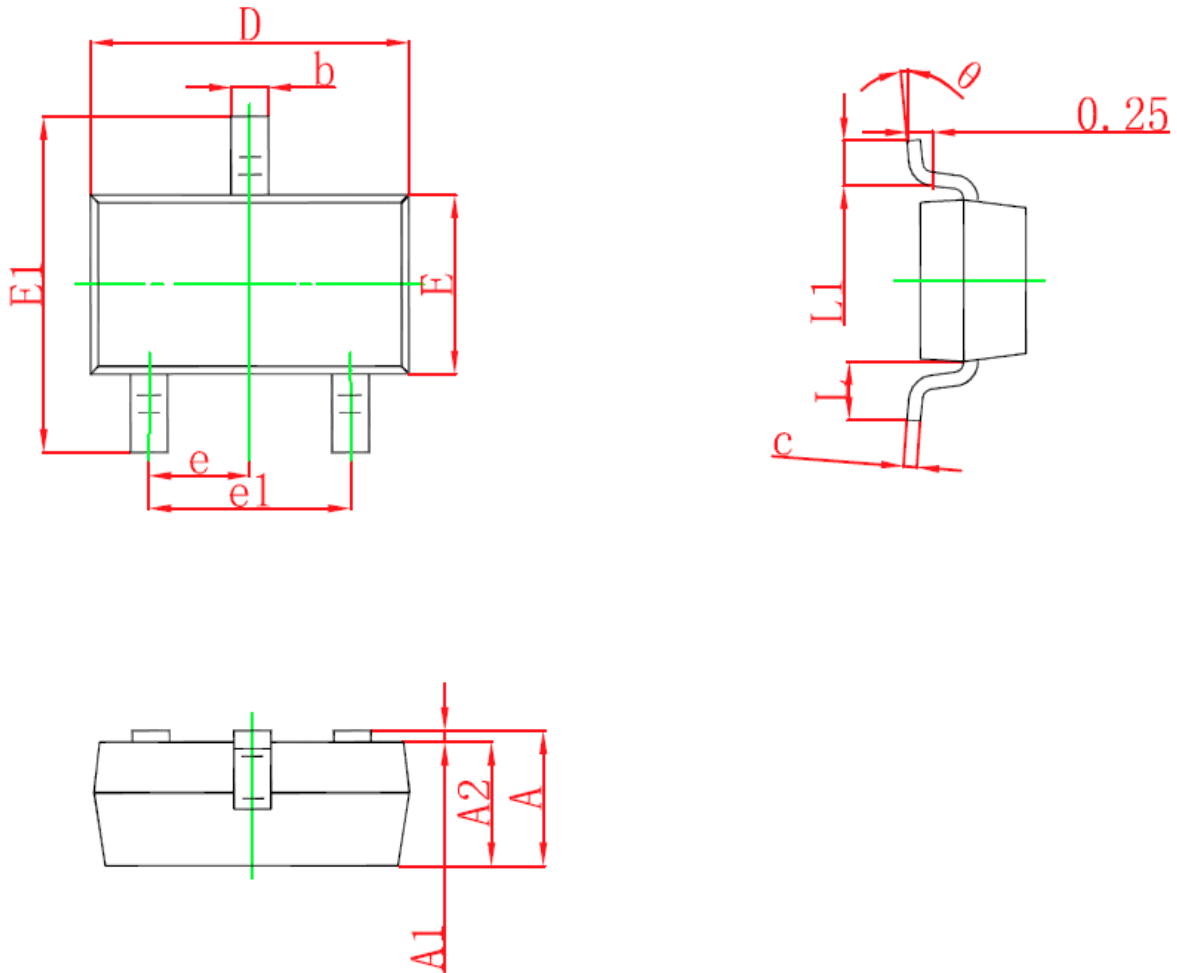


Fig6 Typical Capacitance Vs. Drain-Source

SOT-23 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E1	2.250	2.550	0.088	0.100
E	1.200	1.400	0.047	0.055
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°