MLSM MICROELECTRONICS

MLSL3900H

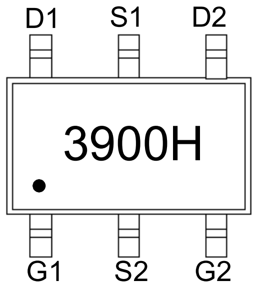
20V/1A Dual N-Channel MOSFET

Features

- Dual N-Channel
- TrenchFET Power MOSFET
- Low Gate Charge
- Low On-resistance
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management

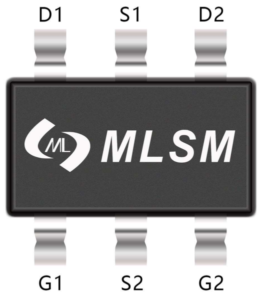


3900H: Device code

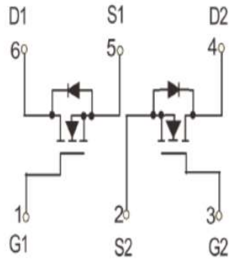
Marking and pin assignment

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
20V	500mΩ@4.5V 800mΩ@2.5V	1A



SOT-23-6L top view



Schematic diagram

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		-50 to 155	°C
I_S	Diode Continuous Forward Current	Tc=25°C	1	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	3.2	A
I_D	Continuous Drain Current	Tc=25°C	1	A
P_D	Maximum Power Dissipation	Tc=25°C	0.75	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
MLSL3900H	SOT-23-6L	3900H	3,000	45,000	180,000	7"reel

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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}=±12V, V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.8	1.0	1.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=0.5A	--	360	500	mΩ
		V_{GS}=2.5V, I_D=0.2A	--	540	800	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1MHz	--	38	--	pF
C_{OSS}	Output Capacitance		--	11	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	10	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=10V, I_D=1A, V_{GS}=4.5V	--	0.76	--	nC
Q_{gs}	Gate Source Charge		--	0.37	--	nC
Q_{gd}	Gate Drain Charge		--	0.16	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V, I_D=0.5A, V_{GS}=4.5V, R_G=3Ω	--	4.5	--	nS
t_r	Turn-on Rise Time		--	3.1	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	15	--	nS
t_f	Turn-Off Fall Time		--	3.3	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃, Is=1A	--	--	1.2	V

Typical Operating Characteristics

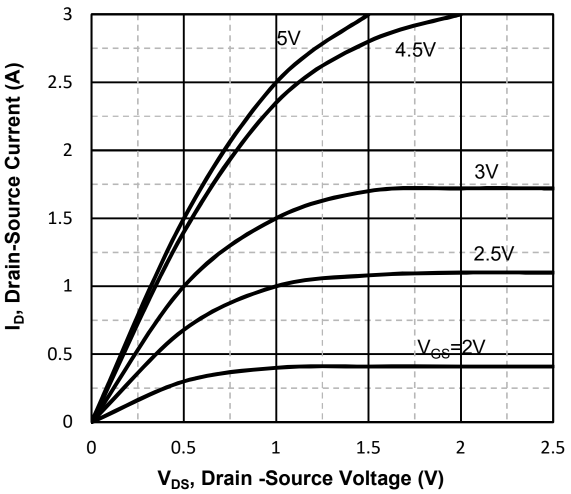

Fig1. Typical Output Characteristics

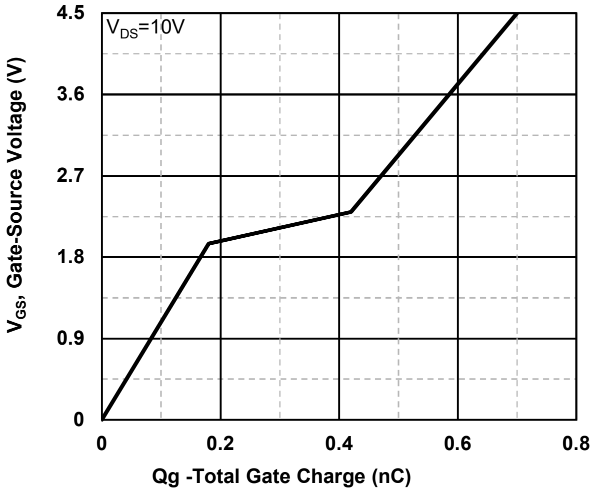

Fig2. Typical Gate Charge Vs.Gate-Source Voltage

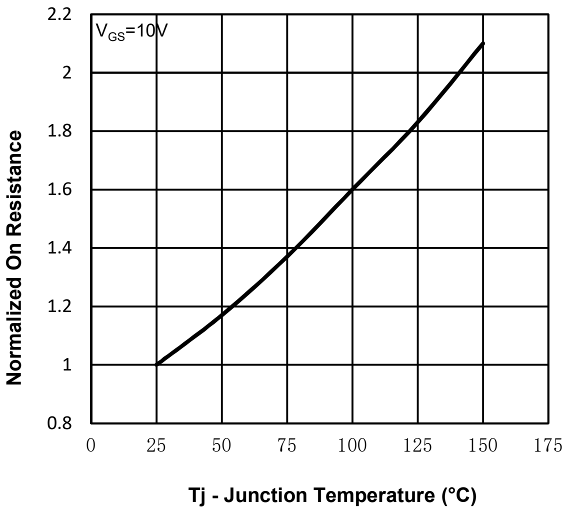

Fig3. Normalized On-Resistance Vs. Temperature

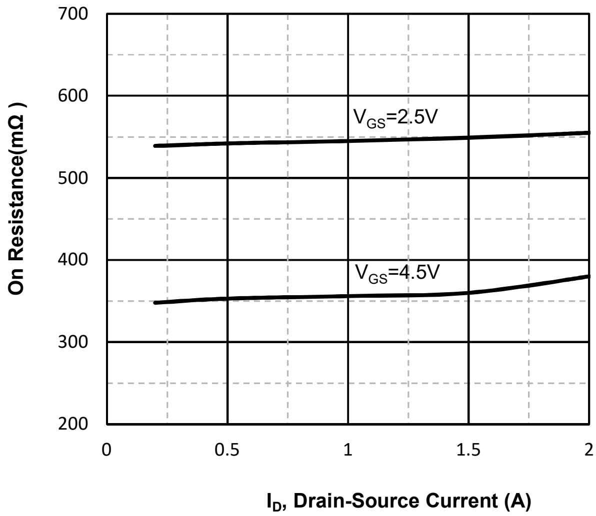

Fig4. On-Resistance Vs. Drain-Source Current

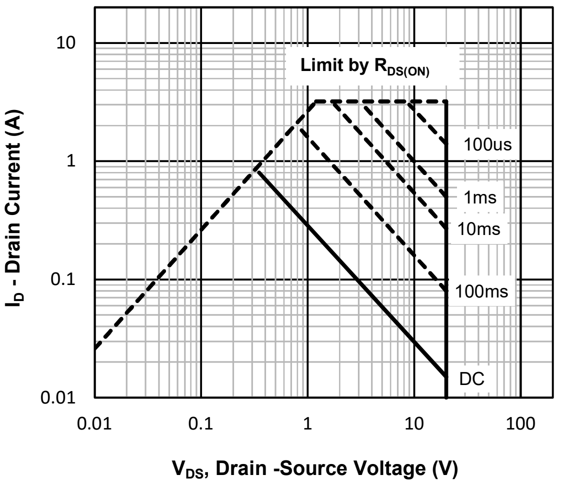

Fig5. Maximum Safe Operating Area

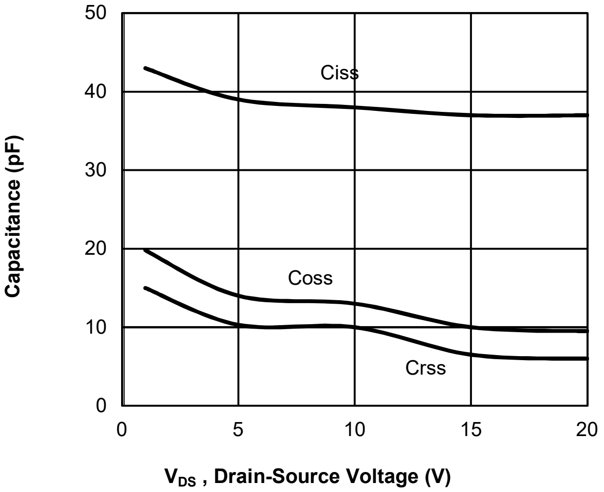

Fig6 Typical Capacitance Vs.Drain-Source Voltage

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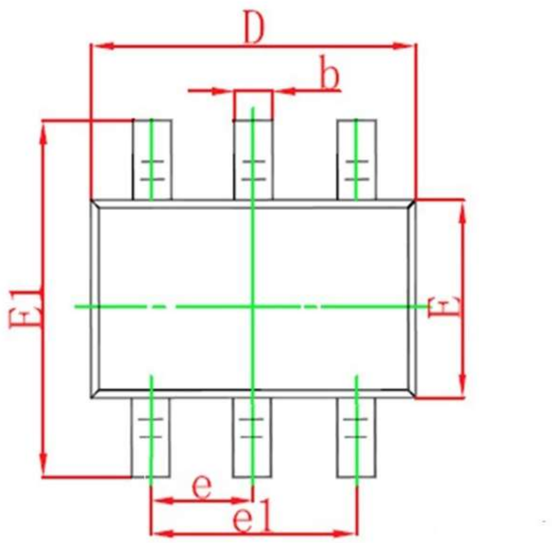
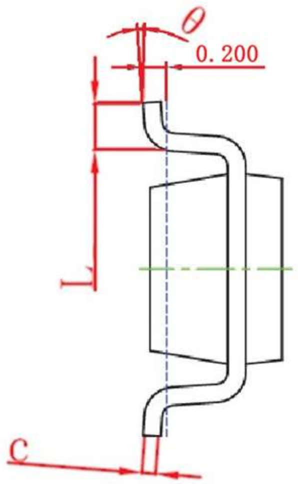
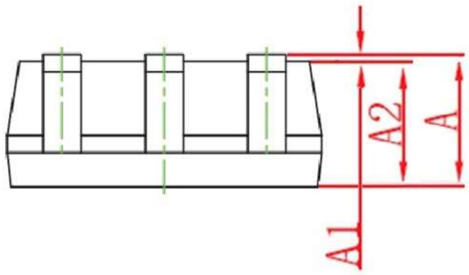
SOT-23-6L Package information







Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.039	0.047
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.600	3.000	0.102	0.118
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
K	0°	8°	0°	8°