MLSM
MICROELECTRONICS

MLS1012

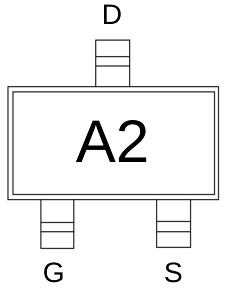
20V/0.5A N-Channel MOSFET

Features

- Low On-Resistance
- Low Threshold
- Fast Switching Speed
- ESD protected up to 2KV

Application

- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

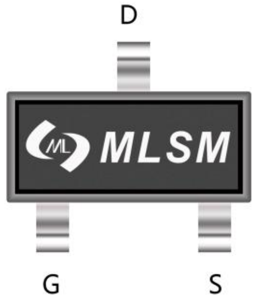


A2: Device code

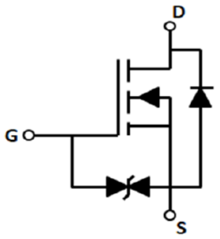
Marking and pin assignment

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
20V	150mΩ@4.5V	0.5A
	200mΩ@2.5V	



SOT-23 top view



Schematic diagram

Pb-Free RoHS Halogen-Free

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		±10	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	0.5	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	1.5	A
I_D	Continuous Drain Current	Tc=25°C	0.5	A
P_D	Maximum Power Dissipation	Tc=25°C	225	W
ESD	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**
MLS1012	SOT-23	A2	3,000	45,000	180,000	7"reel

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	--	--	1.0	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	0.5	0.7	1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V，I_D=1.0A	--	95	150	mΩ
		V_{GS}=2.5V，I_D=0.5A	--	125	200	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=10V，V_{GS}=0V， f=1MHz	--	--	110	pF
C_{OSS}	Output Capacitance		--	--	18	pF
C_{RSS}	Reverse Transfer Capacitance		--	--	15	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=10V，I_D=0.5A，V_{GS}=4.5V	--	1.1	--	nC
Q_{gs}	Gate Source Charge		--	0.19	--	nC
Q_{gd}	Gate Drain Charge		--	0.27	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V，I_D=0.5A，V_{GS}=4.5V，R_G=10Ω	--	6.7	--	nS
t_r	Turn-on Rise Time		--	4.8	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	17.3	--	nS
t_f	Turn-Off Fall Time		--	7.4	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=0.5A	--	--	1.2	V

Typical Operating Characteristics

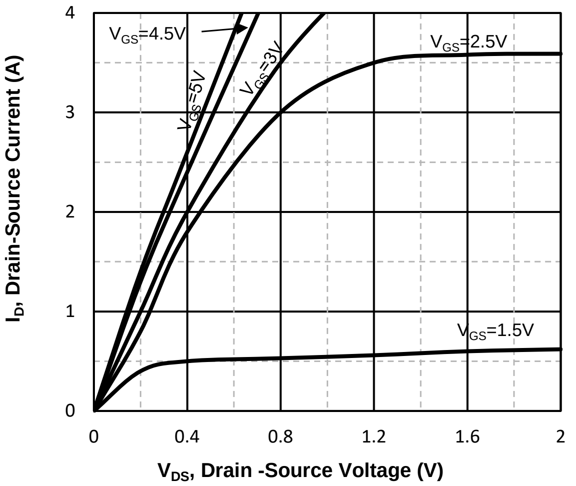


Fig1. Typical Output Characteristics

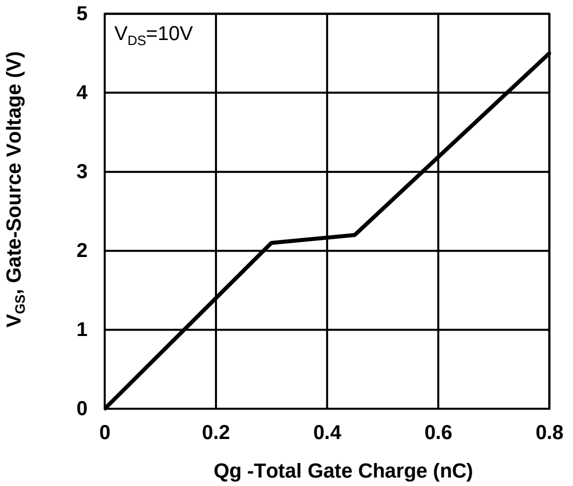


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

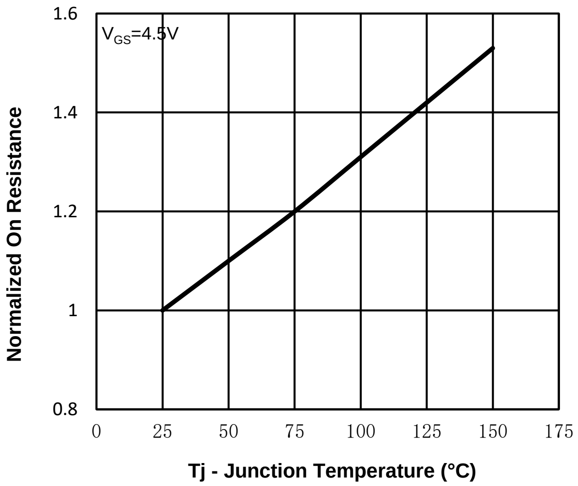


Fig3. Normalized On-Resistance Vs. Temperature

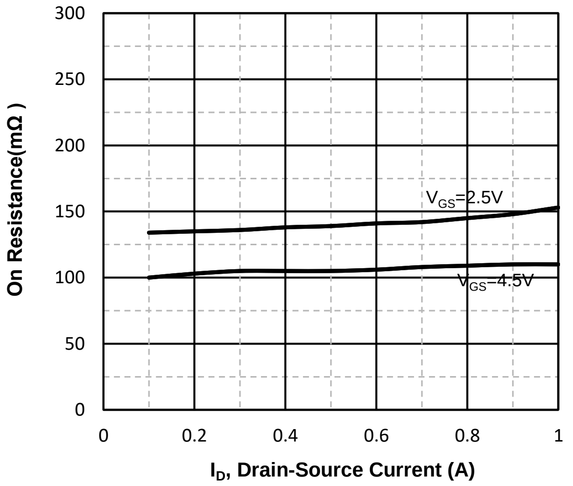


Fig4. On-Resistance Vs. Drain-Source Current

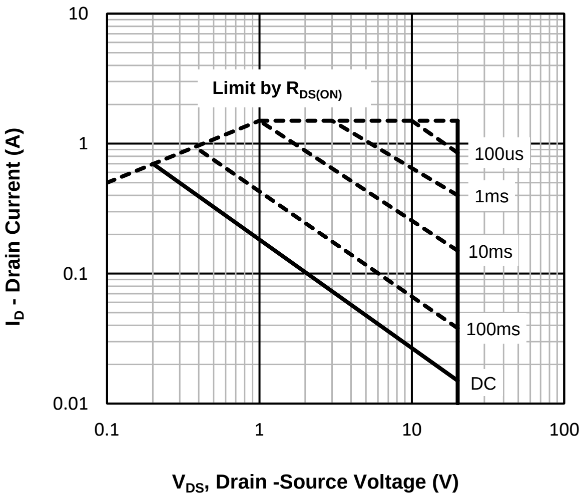


Fig5. Maximum Safe Operating Area

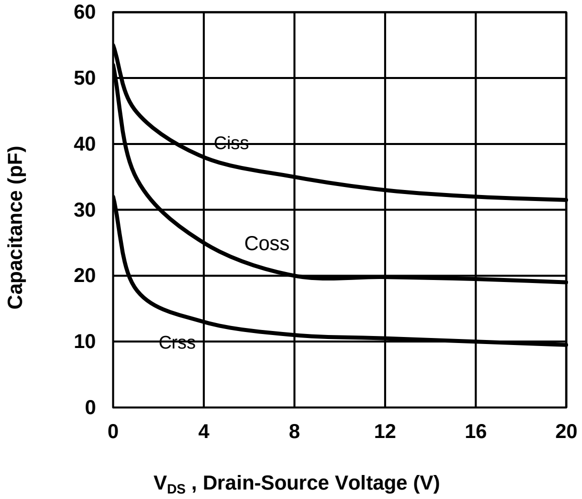
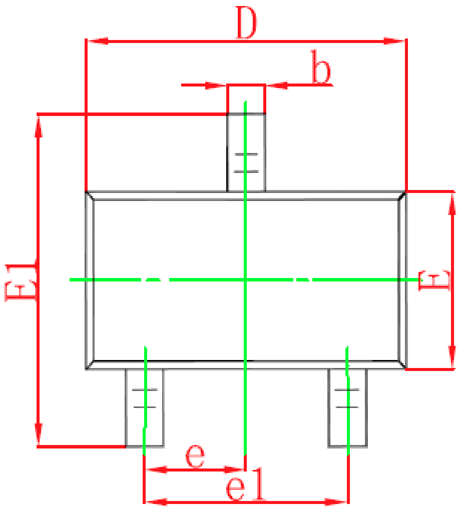
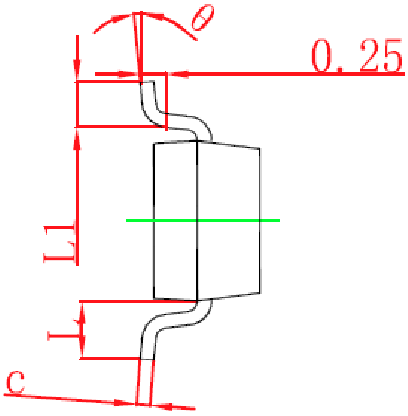
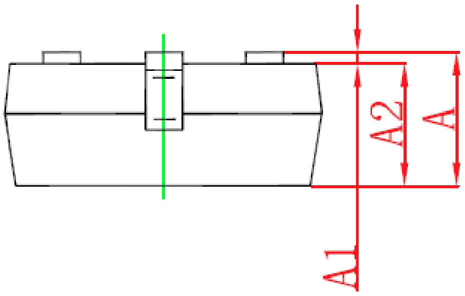


Fig6 Typical Capacitance Vs.Drain-Source Voltage

SOT-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°