MLSM
MICROELECTRONICS

BSS138T

50V/0.22A N-Channel MOSFET

Features

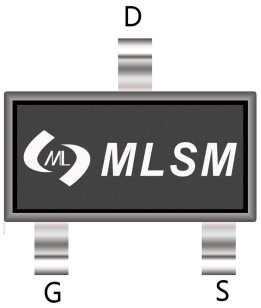
- Low on-resistance
- Fast switching speed
- Easily designed drive circuits
- Easy to parallel Portable equipment

Application

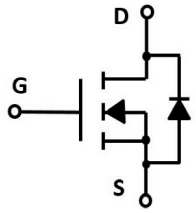
- Interfacing,Switching

Product Summary

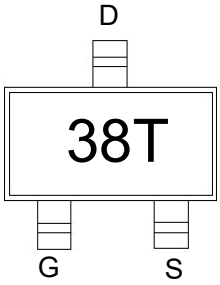
V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
50V	3.5Ω@10V	0.22A
	6.0Ω@5V	



SOT-523 top view



Schematic diagram



38T: Device code

Marking and pin assignment

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		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	0.22	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	1	A
I_D	Continuous Drain Current	Tc=25°C	0.22	A
P_D	Maximum Power Dissipation	Tc=25°C	0.15	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient		250	°C/W

Ordering Information (Example)						
Type	**Package**	**Marking**	**Minimum Package(pcs)**	**Inner Box Quantity(pcs)**	**Outer Carton Quantity(pcs)**	**Delivery Mode**
BSS138T	SOT-523	38T	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	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	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}，I_D=250μA	0.8	--	1.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V，I_D=0.22A	--	1	3.5	Ω
		V_{GS}=5V，I_D=0.22A	--	1.2	6	Ω
		V_{GS}=2.75V，I_D=0.2A	--	1.35	10	Ω
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=25V，V_{GS}=0V， f=1MHz	--	28.5	--	pF
C_{OSS}	Output Capacitance		--	2.7	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	1.78	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=25V，I_D=0.22A，V_{GS}=10V	--	1.7	--	nC
Q_{gs}	Gate Source Charge		--	0.4	--	nC
Q_{gd}	Gate Drain Charge		--	0.24	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=25V，I_D=0.22A，V_{GS}=10V，R_G=6Ω	--	2.6	--	nS
t_r	Turn-on Rise Time		--	18.8	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	9.7	--	nS
t_f	Turn-Off Fall Time		--	47	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=0.22A	--	--	1.2	V

Typical Operating Characteristics

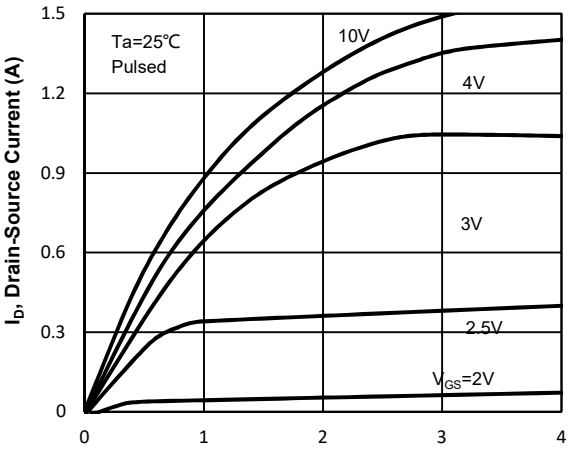


Fig1. Typical Output Characteristics

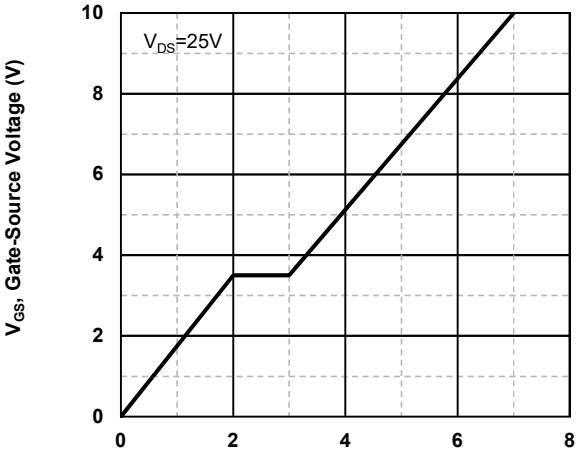


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

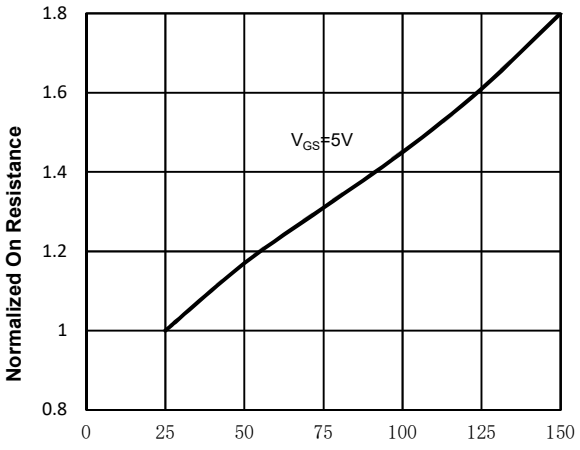


Fig3. Normalized On-Resistance Vs. Temperature

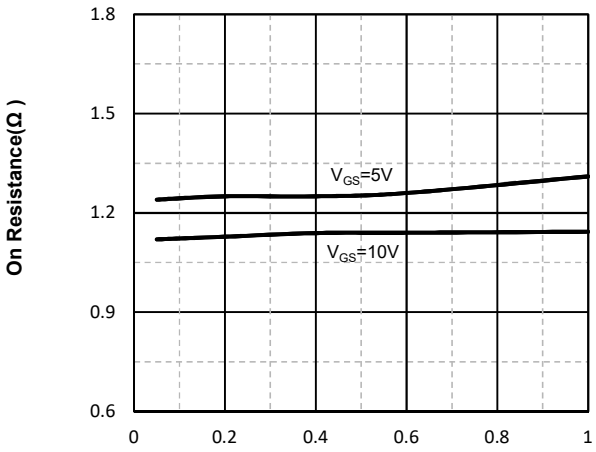


Fig4. On-Resistance Vs. Drain-Source Current

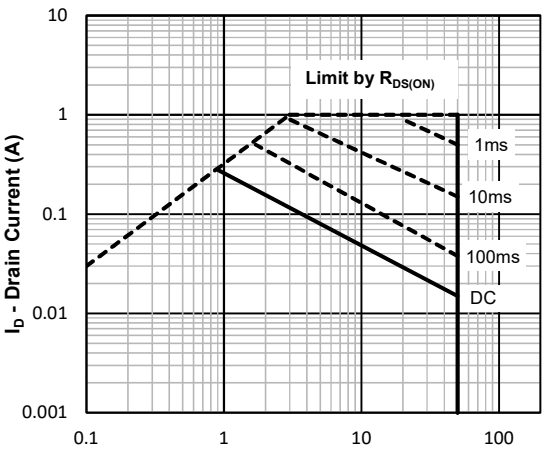


Fig5. Maximum Safe Operating Area

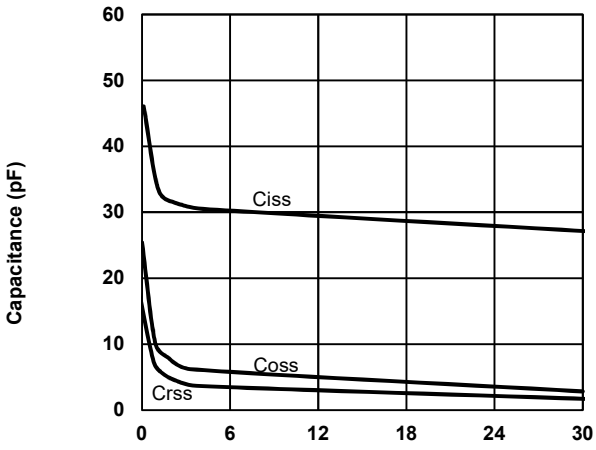
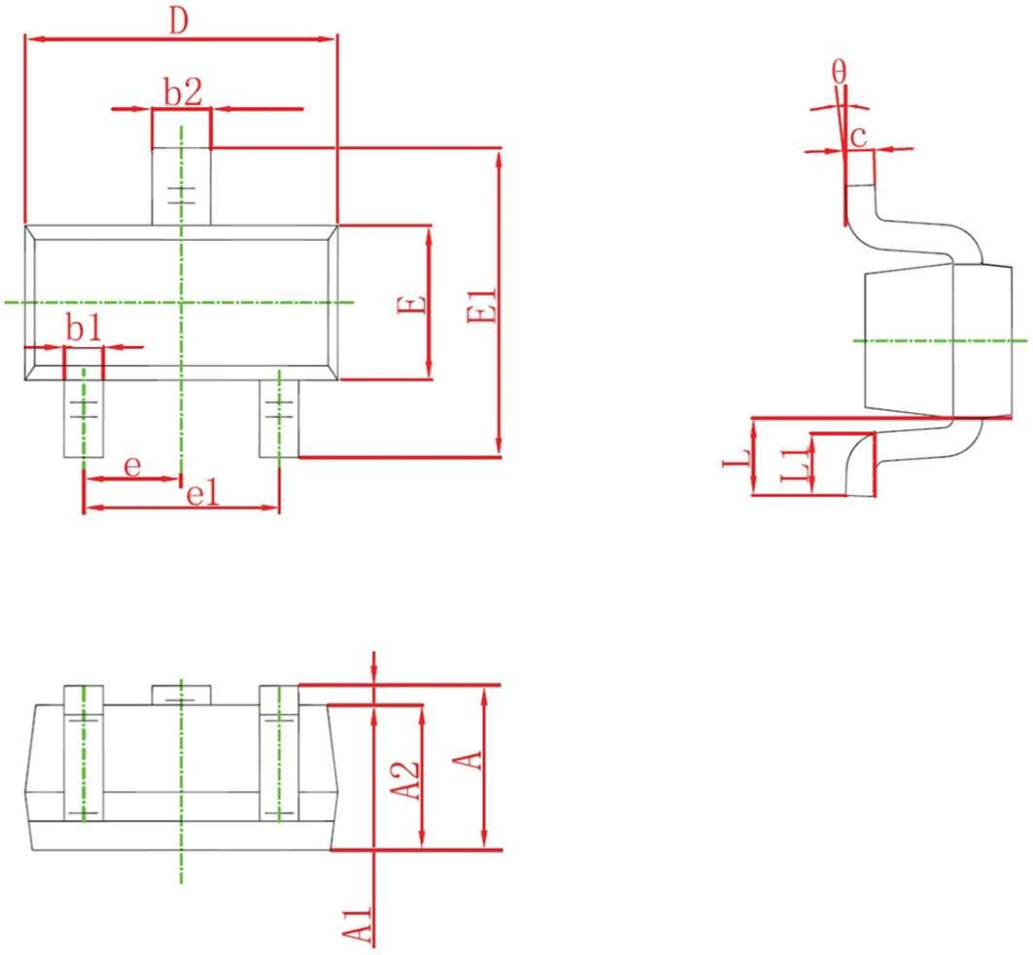


Fig6 Typical Capacitance Vs.Drain-Source Voltage

SOT-523 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500TYP		0.020TYP	
e1	0.900	1.100	0.035	0.043
L	0.400REF		0.016REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°