N-Channel Enhancement Mode MOSFET

BSS138LV

Features

HF

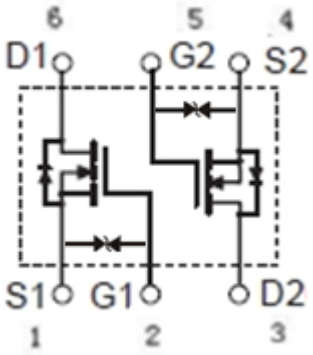
- Low on-resistance
- Low input capacitance
- Fast switching speed
- ESD protection up to 1.5kV (Human body mode)

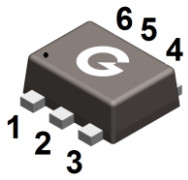
Typical Applications

- DC-DC converters
- Power management functions
- Battery operated systems and solid-state relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Mechanical Data

- Case: SOT-563
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin-Plated Leads, Solderability-per MIL-STD-202, Method 208





SOT-563

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BSS138LV	SOT-563	3000 pcs / Tape & Reel	MM5.

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	50	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (V_{GS} = 4.5V) *1	I_D	210	mA

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation *1	P_D	0.25	W
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	248	°C/W
Thermal Resistance Junction-to-Lead *1	$R_{\theta JL}$	143	°C/W
Thermal Resistance Junction-to-Case *1	$R_{\theta JC}$	159	°C/W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{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	-	-	±10	μA
On Characteristics *2						
$R_{DS(ON)}$	Static Drain-Source On-resistance	V_{GS} = 10V, I_D = 0.5A	-	1.55	2.5	Ω
		V_{GS} = 4.5V, I_D = 0.2A	-	1.82	3	
		V_{GS} = 2.5V, I_D = 0.1A	-	4.36	5.5	
$V_{GS(TH)}$	Static Drain-Source On-resistance	V_{DS} = V_{GS}, I_D = 250μA	0.8	1.0	1.5	V
Dynamic Characteristics *3						
Ciss	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	43	-	pF
Coss	Output Capacitance		-	14	-	
Crss	Reverse Transfer Capacitance		-	8	-	
Switching Characteristics *3						
Q_G	Total Gate-Charge	V_{DD} = 25V V_{GS} = 4.5V I_D = 0.2A	-	1.9	-	nC
Q_{GS}	Gate to Source Charge		-	0.9	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	0.3	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 30V, I_D = 0.2A V_{GS} = 10V, R_G = 25Ω	-	2.7	-	ns
t_r	Turn-on Rise Time		-	2.5	-	
$t_{d(off)}$	Turn-Off Delay Time		-	19	-	
t_f	Turn-Off Fall Time		-	11	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_S = 0.5A, V_{GS} = 0V	-	0.93	1.4	V
trr	Reverse Recovery Time	I_{SD} = 1A, V_{GS} = 0V dI_{SD}/d_t = 100A/μs	-	21.1	-	ns
Qrr	Reverse Recovery Charge		-	9.48	-	nC

Notes:

1、 The data tested by surface mounted on a 23mm * 18mm * 1mm FR4-epoxy P.C.B

2、 Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

3、 Guaranteed by design, not subject to production.

Ratings and Characteristic Curves (@ T_A = 25℃ unless otherwise specified)

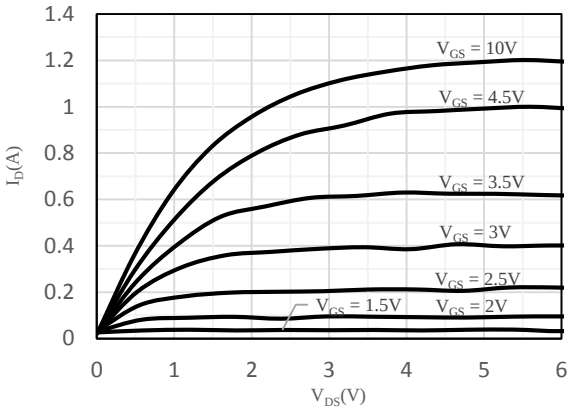


Fig 1 Output Characteristics

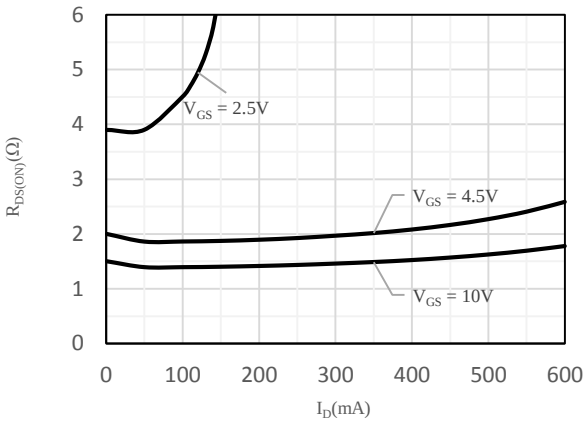


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

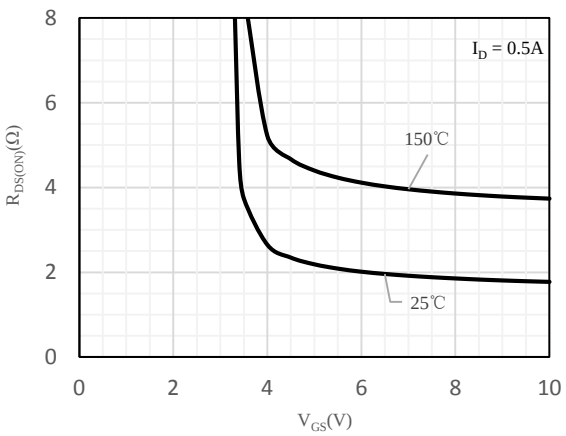


Fig 3 On-Resistance vs. Gate-Source Voltage

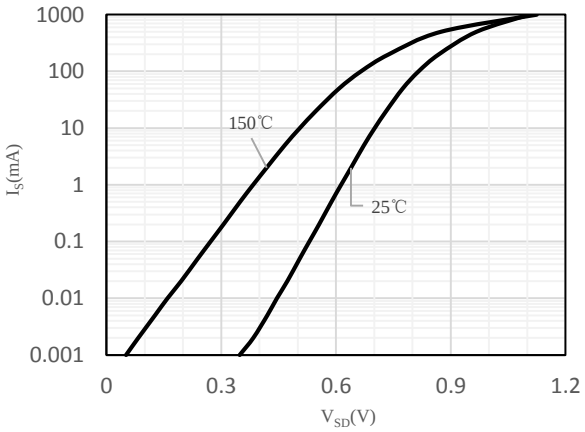


Fig 4 Body-Diode Characteristics

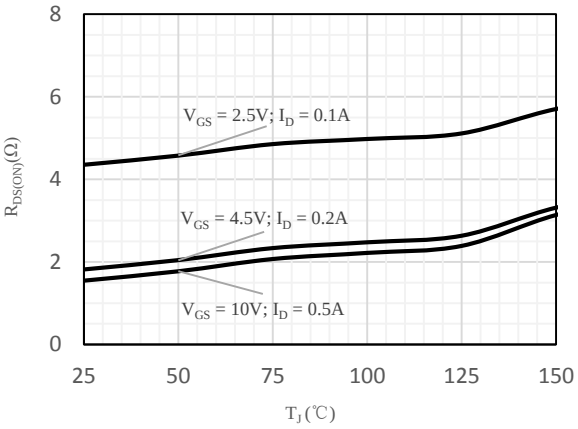


Fig 5 On-Resistance vs. Junction Temperature

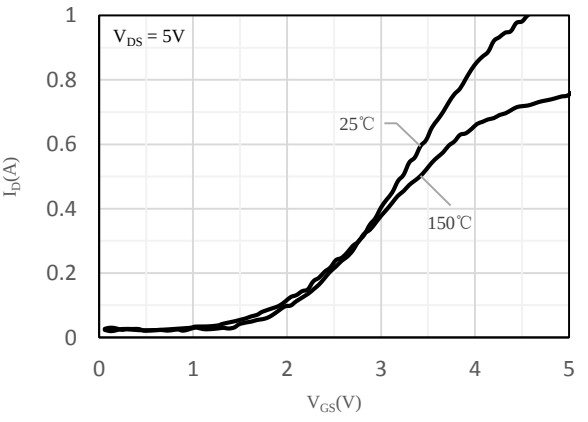


Fig 6 Transfer Characteristics

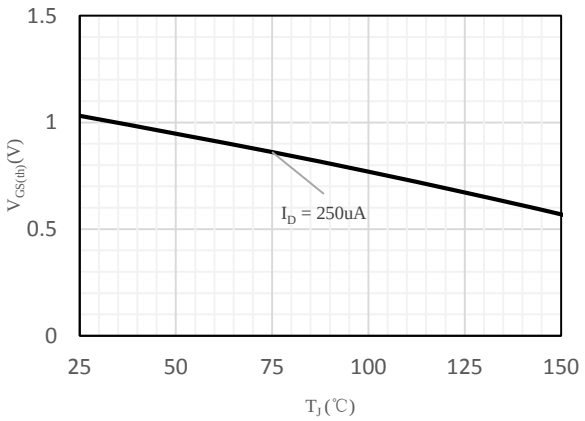


Fig 7 Gate Voltage vs. Junction Temperature

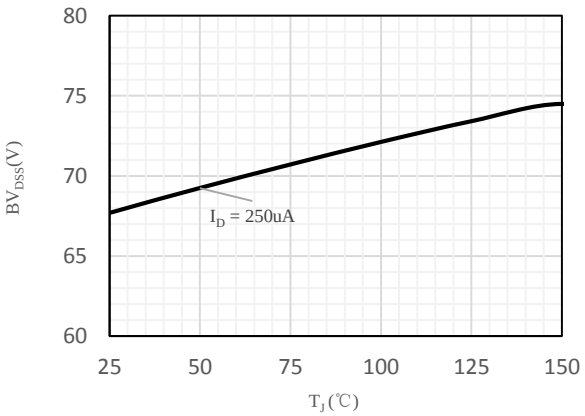


Fig 8 Drain-Source vs. Junction Temperature

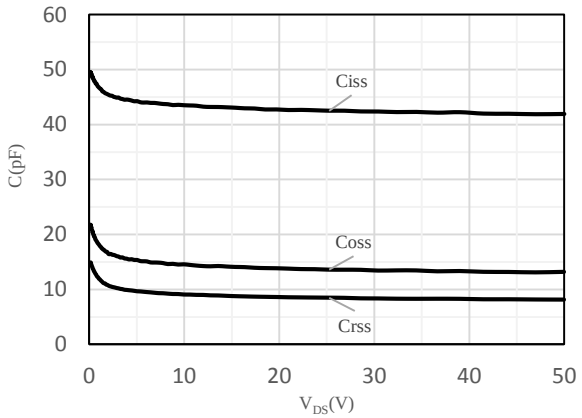


Fig 9 Capacitance Characteristics

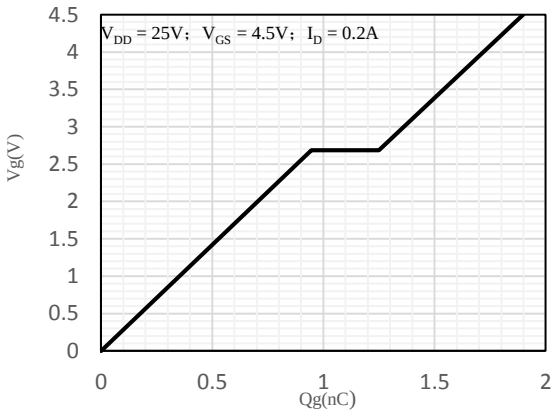
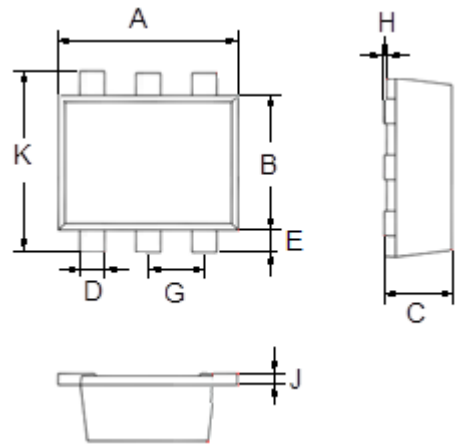


Fig 10 Gate-Charge Characteristics

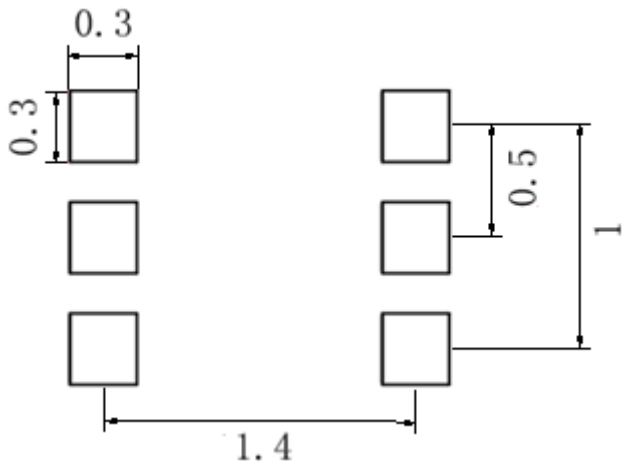
Package Outline Dimensions (Unit: mm)



SOT-563		
Dimension	**Min.**	**Max.**
A	1.500	1.700
B	1.100	1.300
C	0.525	0.600
D	0.170	0.270
E	0.100	0.300
G	0.450	0.550
H	0.000	0.050
J	0.090	0.160
K	1.500	1.700

Mounting Pad Layout (Unit: mm)

SOT-563



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