

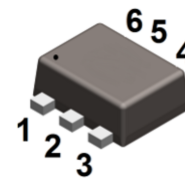
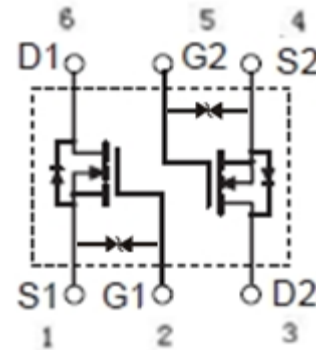


### Features

- 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.



**SOT-563**

### 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

### Ordering Information

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

### Maximum Ratings (@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	50	V
Gate-to-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (V <sub>GS</sub> = 4.5V) *1	I <sub>D</sub>	210	mA

### Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation *1	P <sub>D</sub>	0.25	W
Thermal Resistance Junction-to-Air *1	R <sub>θJA</sub>	248	°C/W
Thermal Resistance Junction-to-Lead *1	R <sub>θJL</sub>	143	°C/W
Thermal Resistance Junction-to-Case *1	R <sub>θJC</sub>	159	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C



### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

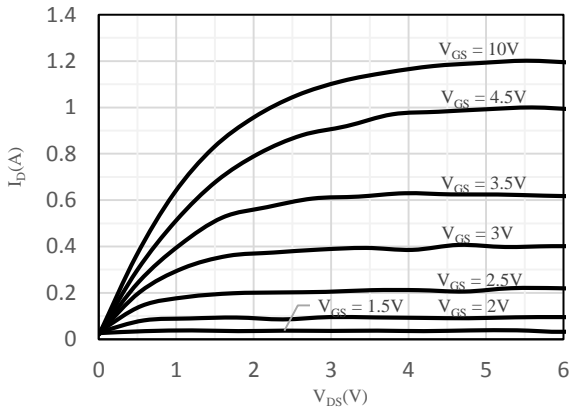
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$V_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	50	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 50V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 10$	$\mu A$
<b>On Characteristics <sup>*2</sup></b>						
$R_{DS(ON)}$	Static Drain-Source On-resistance	$V_{GS} = 10V, I_D = 0.5A$	-	1.55	2.5	$\Omega$
		$V_{GS} = 4.5V, I_D = 0.2A$	-	1.82	3	
		$V_{GS} = 2.5V, I_D = 0.1A$	-	4.36	5.5	
$V_{GS(TH)}$	Static Drain-Source On-resistance	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.8	1.0	1.5	V
<b>Dynamic Characteristics <sup>*3</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$	-	43	-	pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25V$	-	14	-	
$C_{rss}$	Reverse Transfer Capacitance	$f = 1.0MHz$	-	8	-	
<b>Switching Characteristics <sup>*3</sup></b>						
$Q_G$	Total Gate-Charge	$V_{DD} = 25V$	-	1.9	-	nC
$Q_{GS}$	Gate to Source Charge	$V_{GS} = 4.5V$	-	0.9	-	
$Q_{GD}$	Gate to Drain (Miller) Charge	$I_D = 0.2A$	-	0.3	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 30V, I_D = 0.2A$ $V_{GS} = 10V, R_G = 25\Omega$	-	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	-	
<b>Source-Drain Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage <sup>*2</sup>	$I_S = 0.5A, V_{GS} = 0V$	-	0.93	1.4	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 1A, V_{GS} = 0V$	-	21.1	-	ns
$Q_{rr}$	Reverse Recovery Charge	$di_{SD}/dt = 100A/\mu s$	-	9.48	-	nC

Notes:

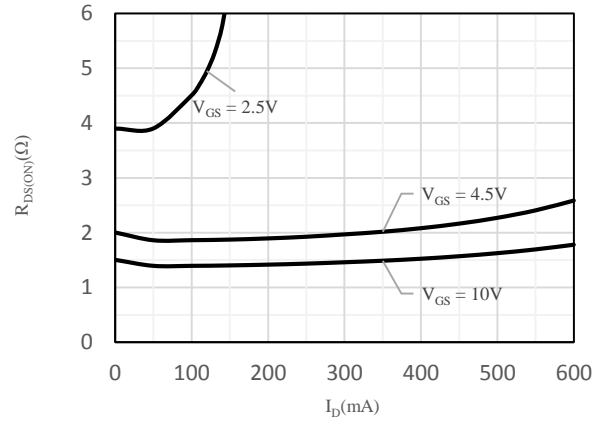
- 1、 The data tested by surface mounted on a 23mm \* 18mm \* 1mm FR4-epoxy P.C.B
- 2、 Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
- 3、 Guaranteed by design, not subject to production.



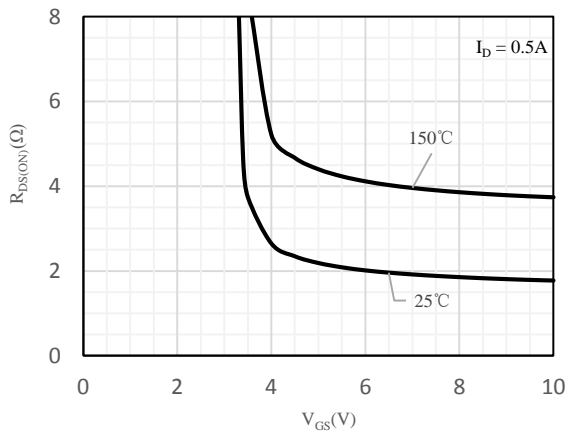
### Ratings and Characteristic Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)



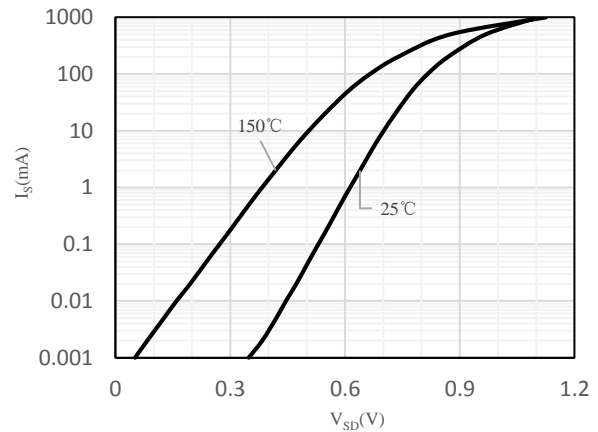
**Fig 1 Output Characteristics**



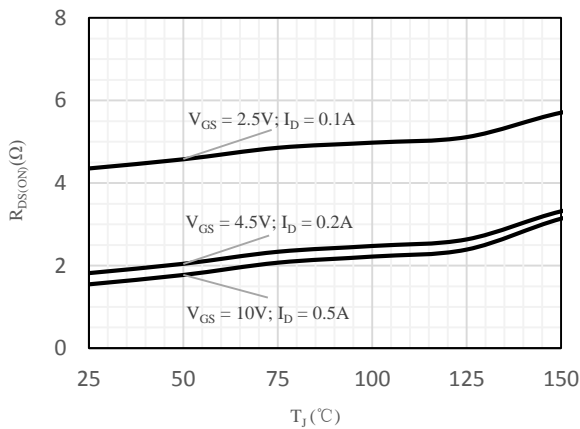
**Fig 2 On-Resistance vs. Drain Current and Gate Voltage**



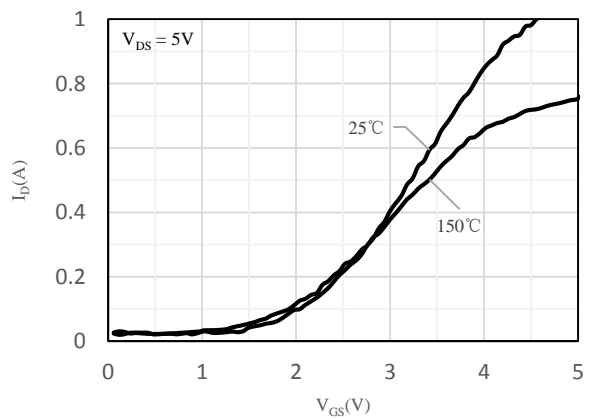
**Fig 3 On-Resistance vs. Gate-Source Voltage**



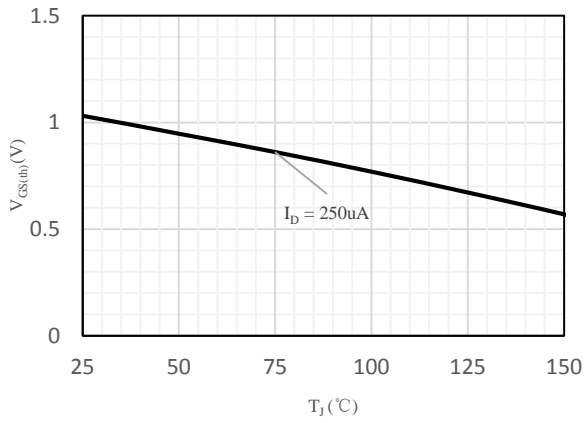
**Fig 4 Body-Diode Characteristics**



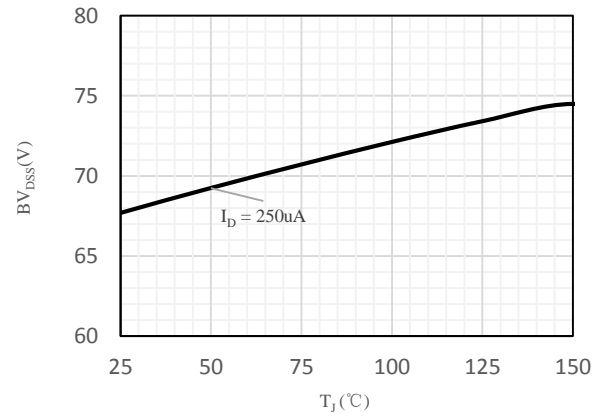
**Fig 5 On-Resistance vs. Junction Temperature**



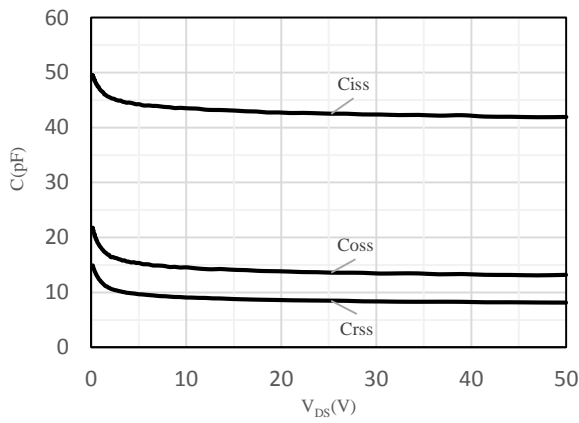
**Fig 6 Transfer Characteristics**



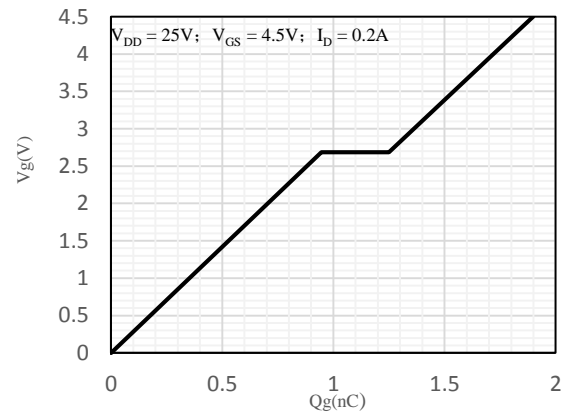
**Fig 7 Gate Voltage vs. Junction Temperature**



**Fig 8 Drain-Source vs. Junction Temperature**



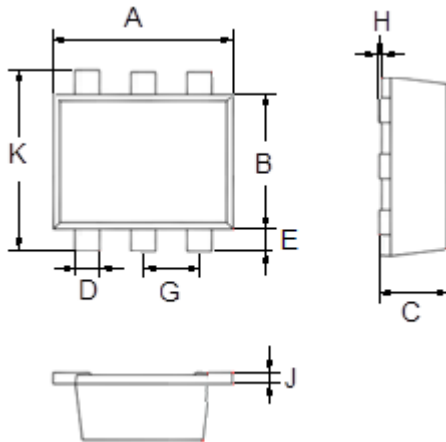
**Fig 9 Capacitance Characteristics**



**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

