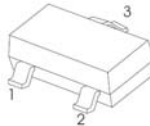


FEATURE

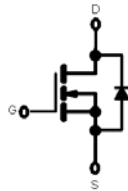
- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

SOT-23

1. GATE
2. SOURCE
3. DRAIN

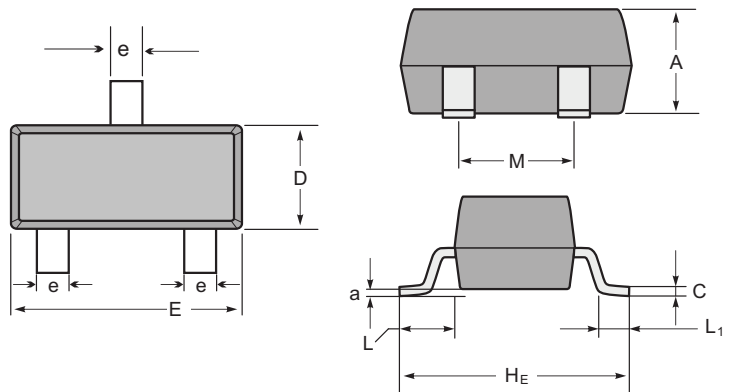


Equivalent Circuit



Marking

Type number	Marking code
BSS138	SS



SOT-23 mechanical data

UNIT		A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

Maximum ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	
Continuous Drain Current	I_D	0.22	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Operating Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 ~ +150	

BSS138

T_a=25 °C unless otherwise specified

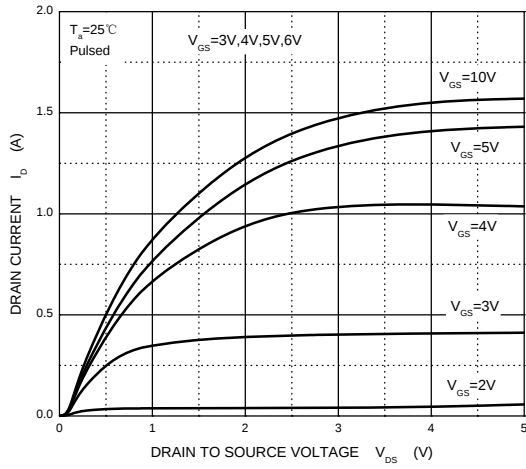
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	50			V
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} =50V, V _{GS} =0V			0.5	μA
		V _{DS} =30V, V _{GS} =0V			100	nA
On characteristics						
Gate-threshold voltage (note 1)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =1mA	0.80		1.50	V
Static drain-source on-resistance (note 1)	R _{DS(on)}	V _{GS} =10V, I _D =0.22A		1.7	3.50	Ω
		V _{GS} =4.5V, I _D =0.22A			6	
Forward transconductance (note 1)	g _{FS}	V _{DS} =10V, I _D =0.22A	0.12			S
Dynamic characteristics (note 2)						
Input capacitance	C _{iSS}	V _{DS} =25V,V _{GS} =0V, f=1MHz		27		pF
Output capacitance	C _{oSS}			13		
Reverse transfer capacitance	C _{rSS}			6		
Switching characteristics						
Turn-on delay time (note 1,2)	t _{d(on)}	V _{DD} =30V, V _{DS} =10V, I _D =0.29A,R _{GEN} =6Ω			5	ns
Rise time (note 1,2)	t _r				18	
Turn-off delay time (note 1,2)	t _{d(off)}				36	
Fall time (note 1,2)	t _f				14	
Drain-source body diode characteristics						
Body diode forward voltage (note 1)	V _{SD}	I _S =0.44A, V _{GS} = 0V			1.4	V

Notes:

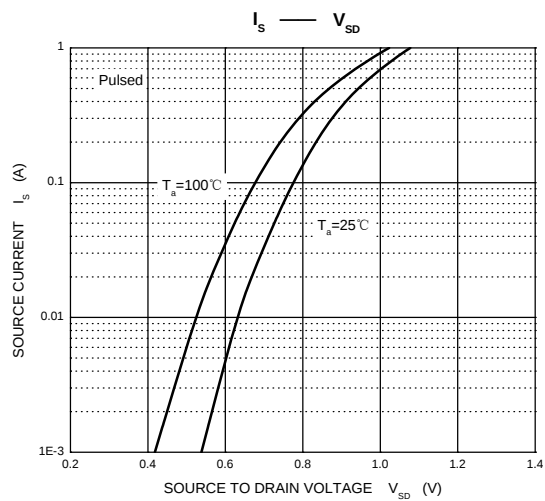
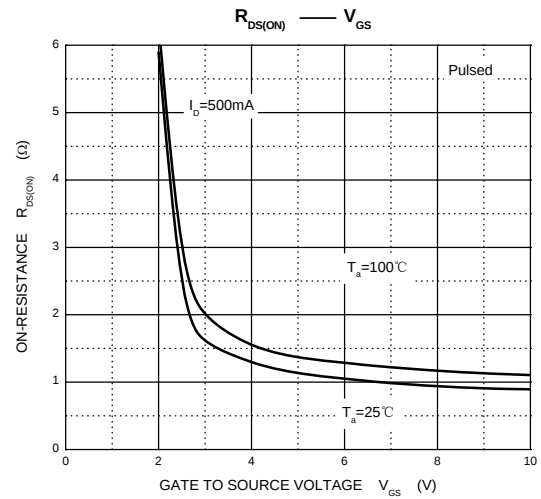
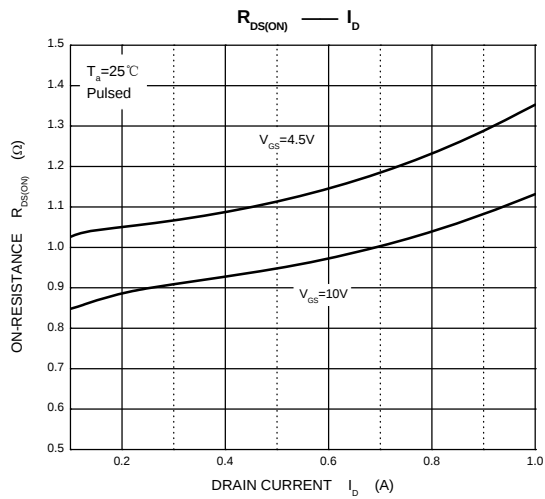
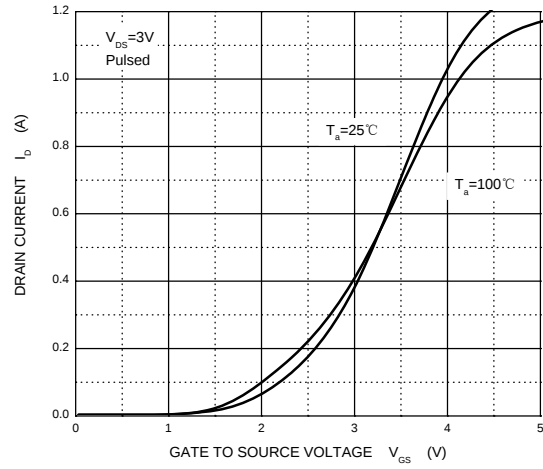
1. Pulse Test ; Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES (BSS138)

Output Characteristics



Transfer Characteristics



Threshold Voltage

