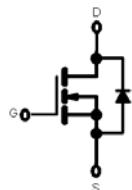


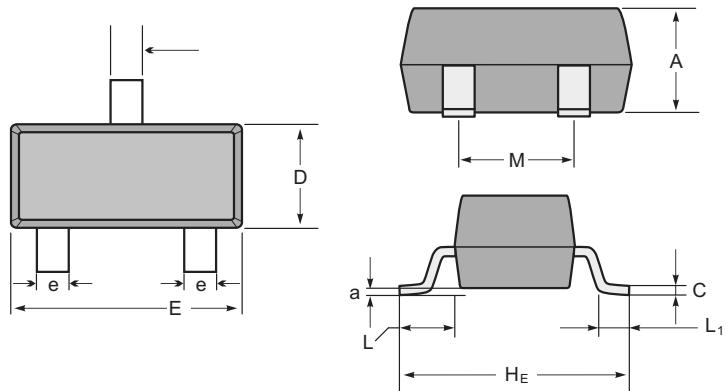
FEATURE

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

SOT-23

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	± 20	V
Continuous Gate-Source Voltage	V_{GSS}			
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		$^\circ\text{C}/\text{W}$
Operating Temperature	T_j	150		$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 ~ +150		

BSS138

$T_a=25^\circ\text{C}$ unless otherwise specified

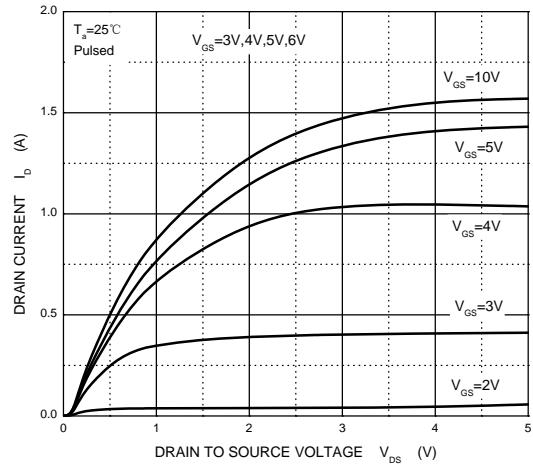
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	50			V
Gate-body leakage	I_{GSS}	$V_{\text{DS}} = 0\text{V}, V_{\text{GS}} = \pm 20\text{V}$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}} = 50\text{V}, V_{\text{GS}} = 0\text{V}$			0.5	μA
		$V_{\text{DS}} = 30\text{V}, V_{\text{GS}} = 0\text{V}$			100	nA
On characteristics						
Gate-threshold voltage (note 1)	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 1\text{mA}$	0.80		1.50	V
Static drain-source on-resistance (note 1)	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 0.22\text{A}$		1.7	3.50	Ω
		$V_{\text{GS}} = 4.5\text{V}, I_D = 0.22\text{A}$			6	
Forward transconductance (note 1)	g_{FS}	$V_{\text{DS}} = 10\text{V}, I_D = 0.22\text{A}$	0.12			S
Dynamic characteristics (note 2)						
Input capacitance	C_{iss}	$V_{\text{DS}} = 25\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$		27		pF
Output capacitance	C_{oss}			13		
Reverse transfer capacitance	C_{rss}			6		
Switching characteristics						
Turn-on delay time (note 1,2)	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 30\text{V}, V_{\text{DS}} = 10\text{V}, I_D = 0.29\text{A}, R_{\text{GEN}} = 6\Omega$			5	ns
Rise time (note 1,2)	t_r				18	
Turn-off delay time (note 1,2)	$t_{\text{d}(\text{off})}$				36	
Fall time (note 1,2)	t_f				14	
Drain-source body diode characteristics						
Body diode forward voltage (note 1)	V_{SD}	$I_s = 0.44\text{A}, V_{\text{GS}} = 0\text{V}$			1.4	V

Notes:

1. Pulse Test ; Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
2. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES (BSS138)

Output Characteristics



Transfer Characteristics

