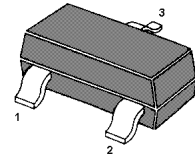


SOT-23 Plastic-Encapsulate MOSFETS

BSS138 N-Channel 50-V(D-S) MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
50 V	3.5Ω@10V	220mA
	6Ω@4.5V	



1.Gate 2.Source 3.Drain
SOT-23 Plastic Package

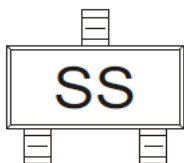
FEATURE

- High density cell design for extremely low $R_{DS(on)}$
- Rugged and Reliable

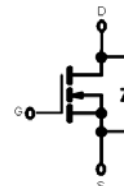
APPLICATION

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers; Display, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

MARKING



Equivalent Circuit



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	-55 ~ +150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 ~ +150	

ELECTRICAL CHARACTERISTICS

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

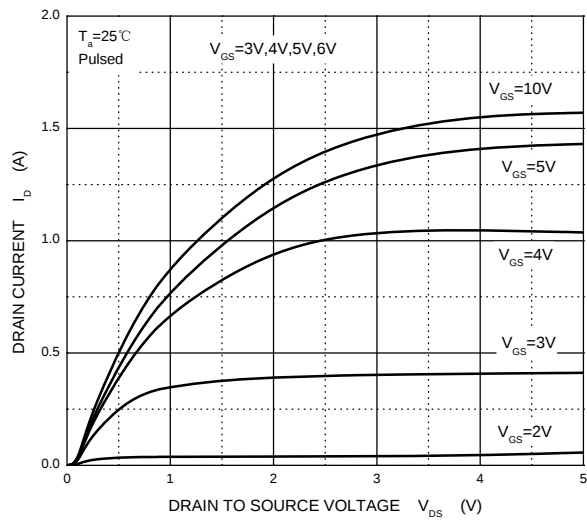
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	50			V
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} =50V, V _{GS} =0V			0.5	μA
		V _{DS} =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			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:

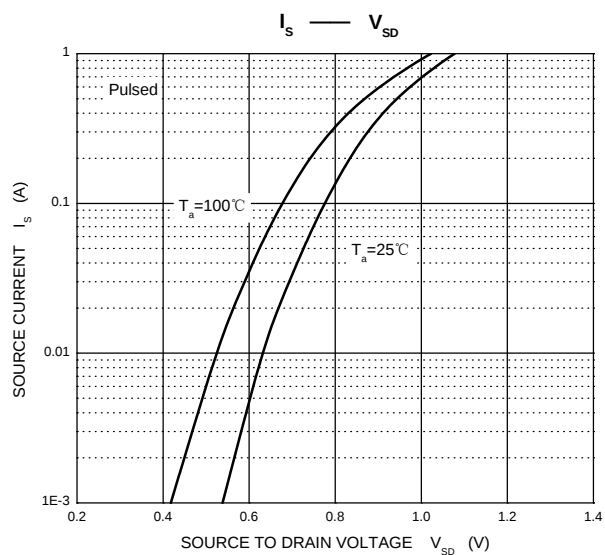
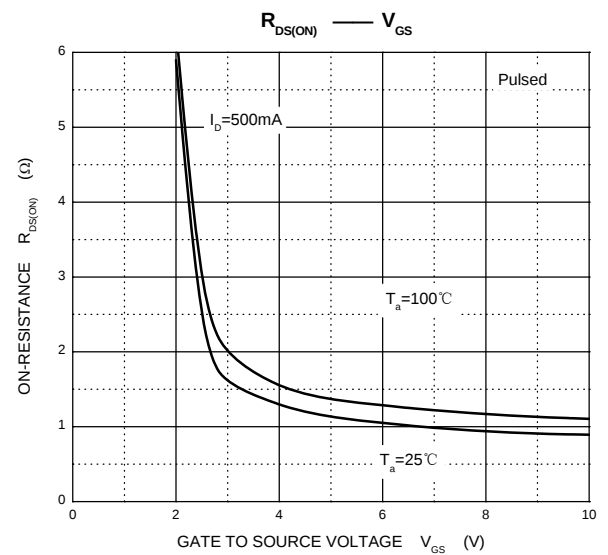
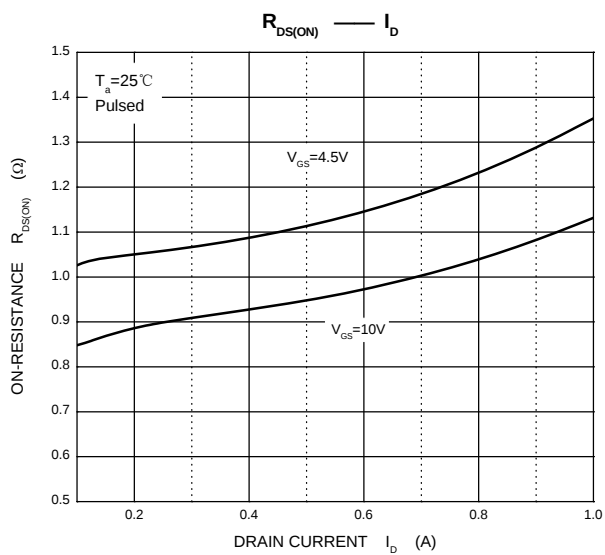
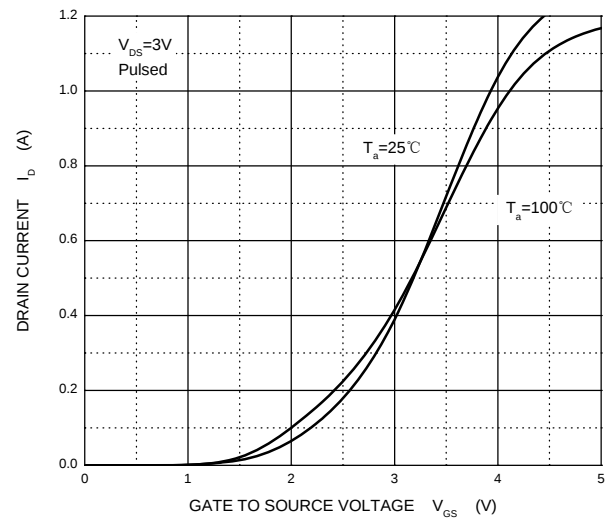
1. Pulse Test ; Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
2. These parameters have no way to verify.

Typical Characteristics

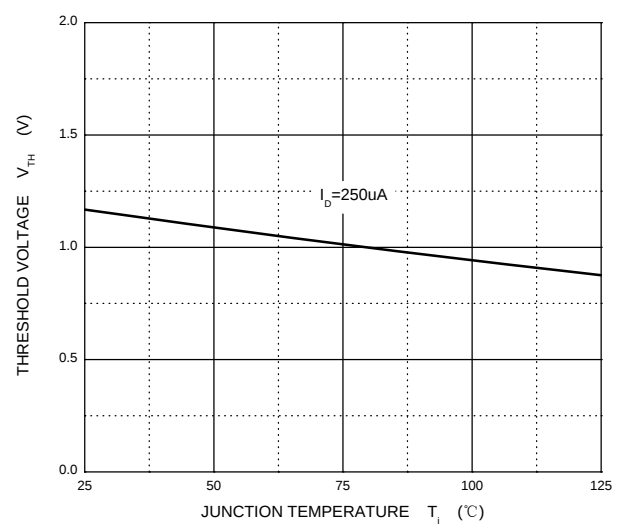
Output Characteristics



Transfer Characteristics

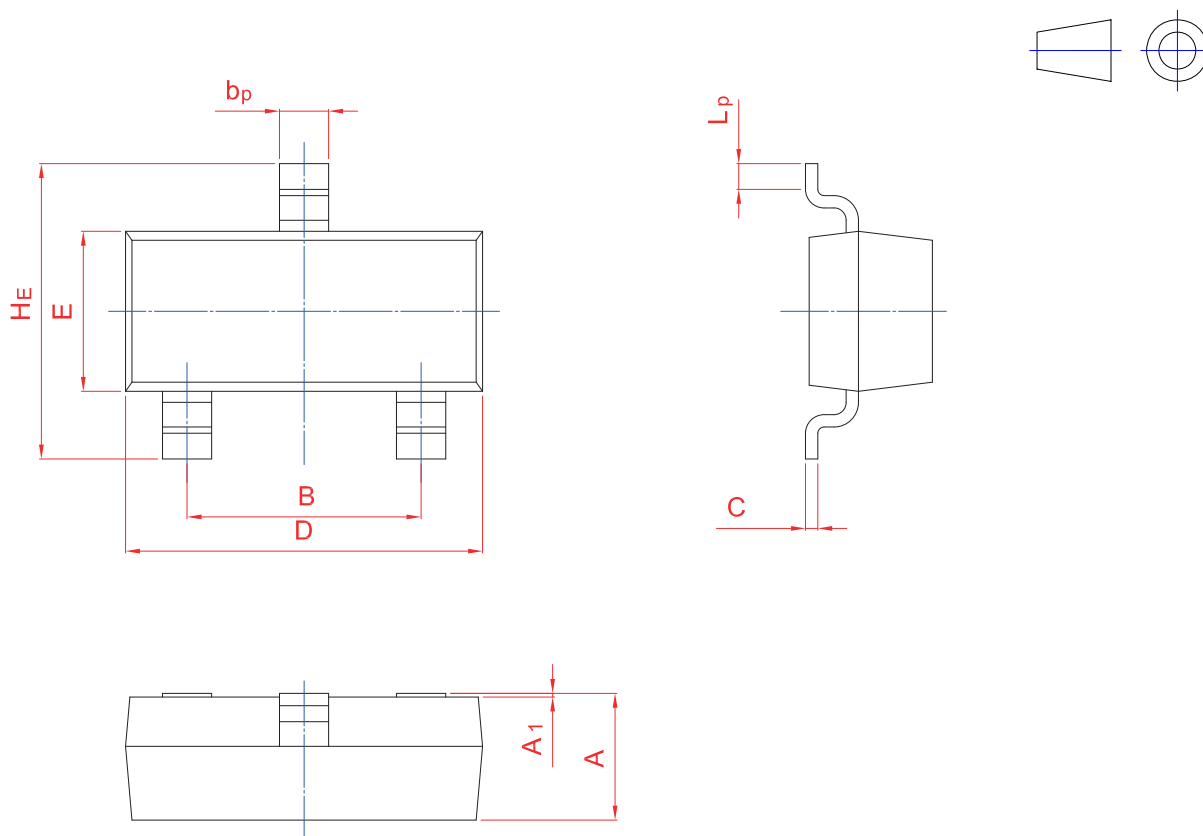


Threshold Voltage



Package Outline

SOT-23



UNIT	A	B	b_p	C	D	E	H_E	A_1	L_p
mm	1.40 0.89	2.04 1.78	0.51 0.30	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20