SOT-23 Plastic-Encapsulate MOSFETS

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

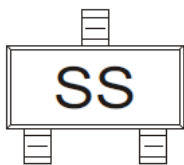| V$_{(BR)DSS}$	R$_{DS(on)}$MAX	I$_D$
50 V	3.5Ω@10V	220mA
	6Ω@4.5V	

1.Gate 2.Source 3.Drain

SOT-23 Plastic Package
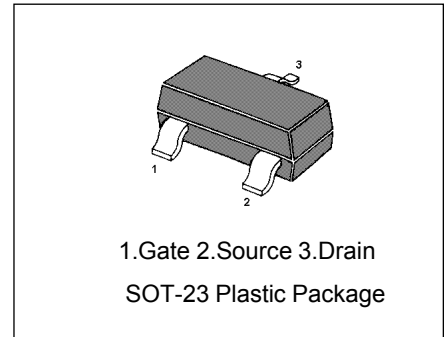
FEATURE

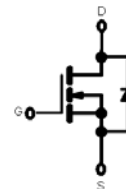- High density cell design for extremely low R$_{DS(on)}$
- Rugged and Relaible

APPLICATION

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

MARKING

SS

Equivalent Circuit

Maximum ratings (T$_a$=25℃ 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$_{θJA}$	357	℃/W
Operating Temperature	T$_j$	150	℃
Storage Temperature	T$_{stg}$	-55 ~+150	

ELECTRICAL CHARACTERISTICS

T_a=25℃ 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:
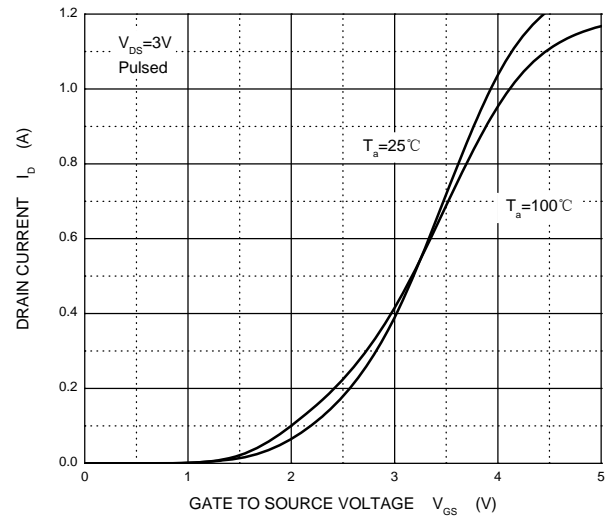
1. Pulse Test ; Pulse Width ≤300µs, Duty Cycle ≤2%.

2. These parameters have no way to verify.
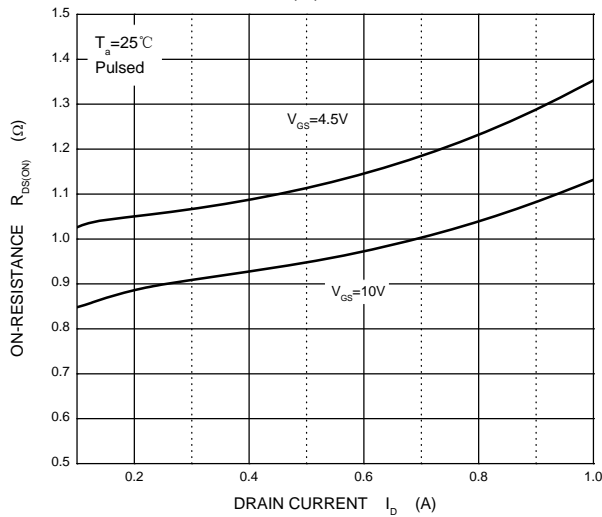
Typical Characteristics
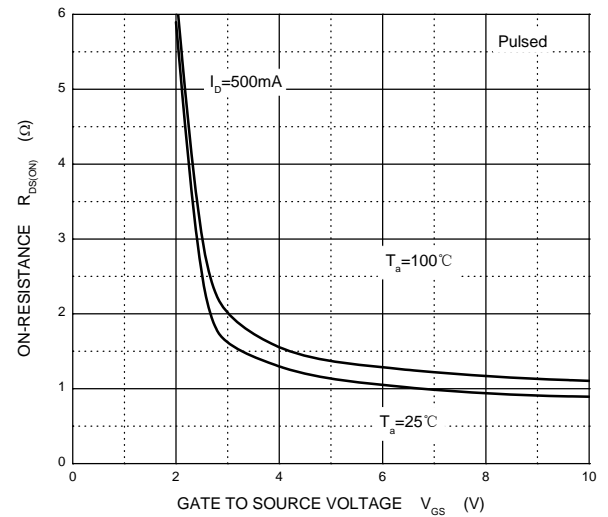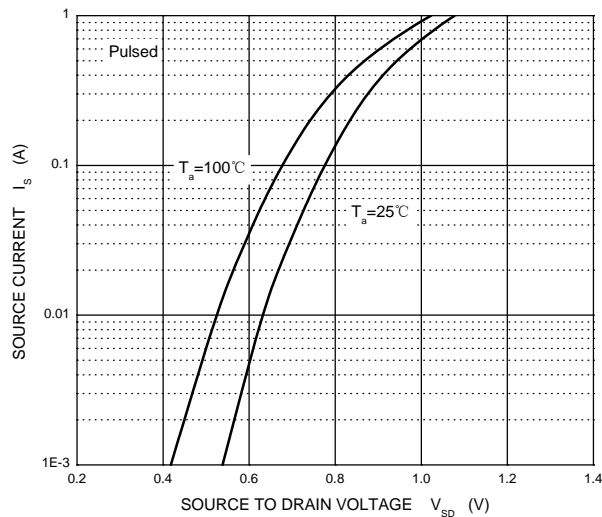
Output Characteristics
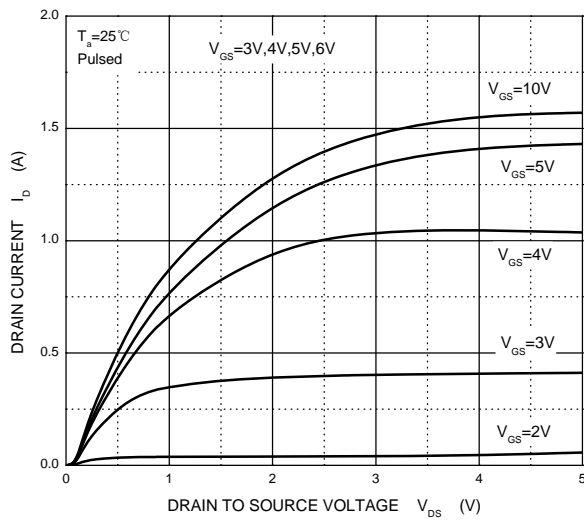
Transfer Characteristics

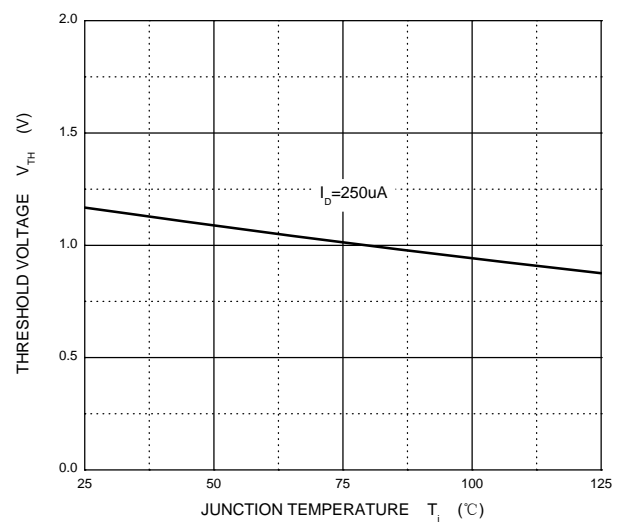### $R_{DS(ON)}$ —— I_D

$R_{DS(ON)}$ —— V_{GS}

I_S —— V_{SD}

Threshold Voltage

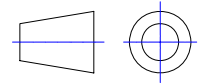# PACKAGE OUTLINE

Plastic surface mounted package; 3 leads   **SOT-23**
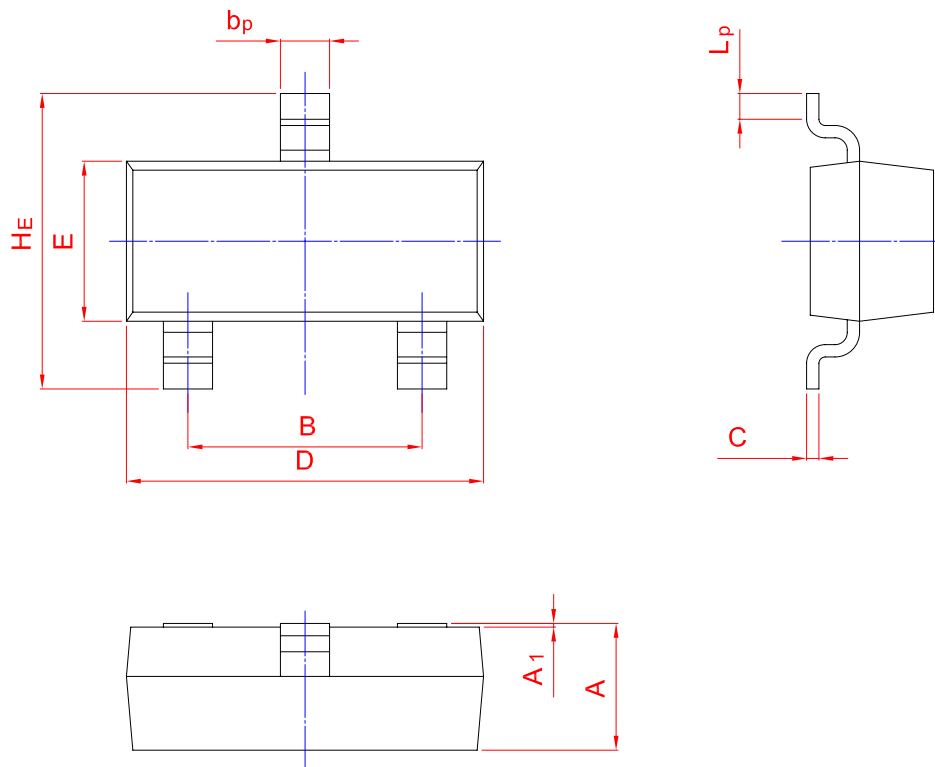
UNIT	A	B	b_p	C	D	E	H_E	A_1	L_p
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20