CHONGQING CLOUDCHILD TECHNOLOGY CO., LTD

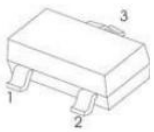
SOT-23 Plastic-Encapsulate MOSFETS

BSS138K

N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
50 V	0.9Ω@10V	0.34A
	1.0Ω@4.5V	

SOT-23



1. GATE
2. SOURCE
3. DRAIN

DESCRIPTION

The BSS138K provides excellent $R_{DS(ON)}$ with low gate charge.

It can be used in a wide variety of applications.

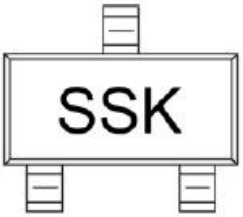
FEATURE

- High density cell design for extremely low RDS(on)
- Rugged and Relaible
- AEC Q101 Qualified

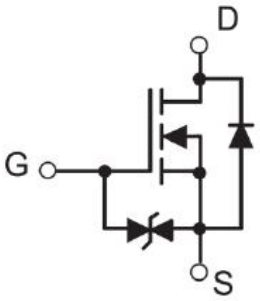
APPLICATION

- 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℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	I_D	0.34	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25 ℃ unless otherwise specified

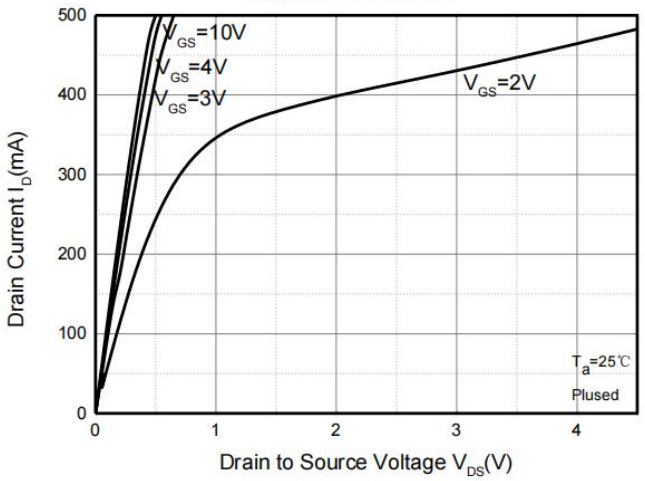
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	50			V
Zero gate voltage drain current	I_{DSS1}	V_{DS} =50V,V_{GS} = 0V			0.5	μA
	I_{DSS2}	V_{DS} =30V,V_{GS} = 0V			100	nA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±10	μA
Gate threshold voltage[1]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.8	1.1	1.5	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =10V, I_D =0.22A		0.9	2.5	Ω
		V_{GS} =4.5V, I_D =0.22A		1.0	6.0	
Forward tranconductance[1]	g_{FS}	V_{DS} =10V, I_D =0.22A		0.13		S
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHz		26.5		pF
Output Capacitance	C_{oss}			12.9		
Reverse Transfer Capacitance	C_{rss}			5.9		
Switching Characteristics[1,2]						
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,I_D=0.29A, V_{GS}=10V,R_G=6Ω			5	nS
Turn-on rise time	t_r				18	
Turn-off delay time	$t_{d(off)}$				36	
Turn-off fall time	t_f				14	
Source-Drain Diode characteristics[1]						
Diode Forward voltage	V_{SD}	I_S=0.44A, V_{GS} = 0V		1.15	1.4	V

Notes:

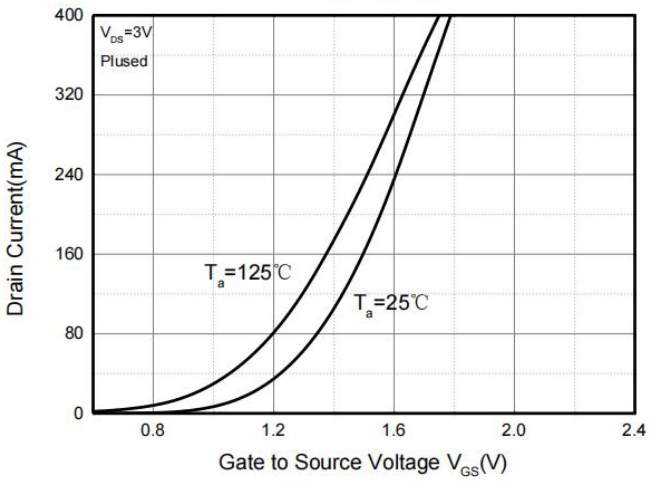
1. Pulse Test ; Pulse Width ≤300μs, Duty Cycle ≤2%.
2. These parameters have no way to verify.

Typical Characteristics

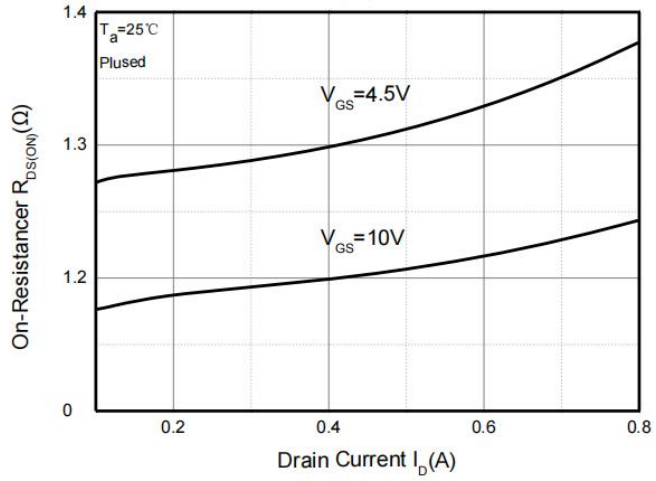
Output Characteristics



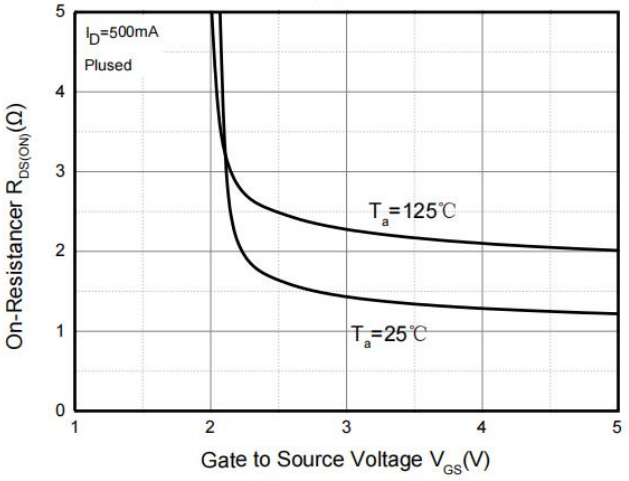
Transfer Characteristics



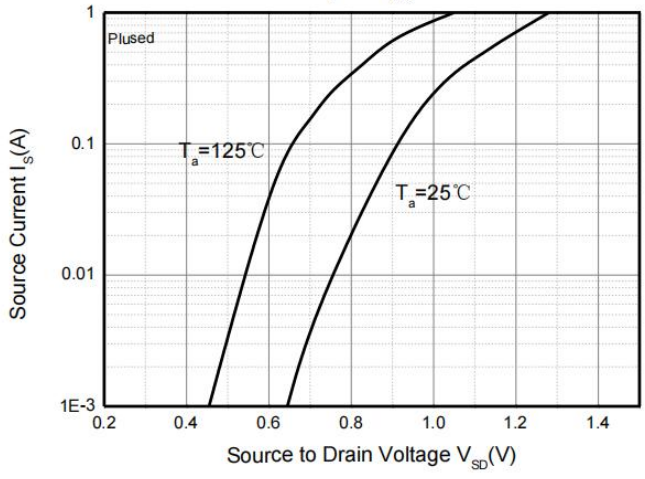
$R_{DS(ON)}$——I_D



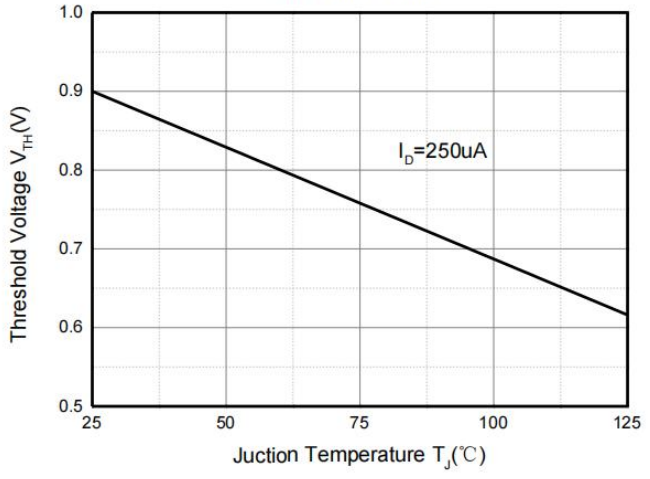
$R_{DS(ON)}$——V_{GS}



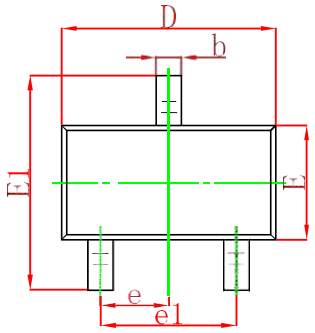
I_S——V_{SD}

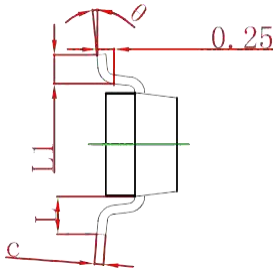


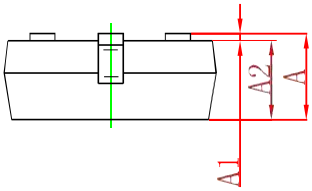
Threshold Voltage



SOT-23 Package Outline Dimensions

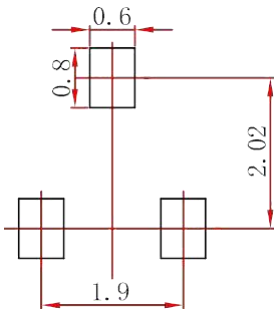






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

NOTICE

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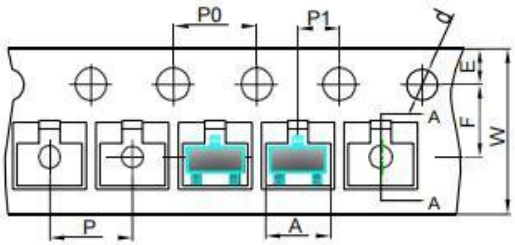
SOT-23 Tape and reel

SOT-23 Embossed Carrier Tape

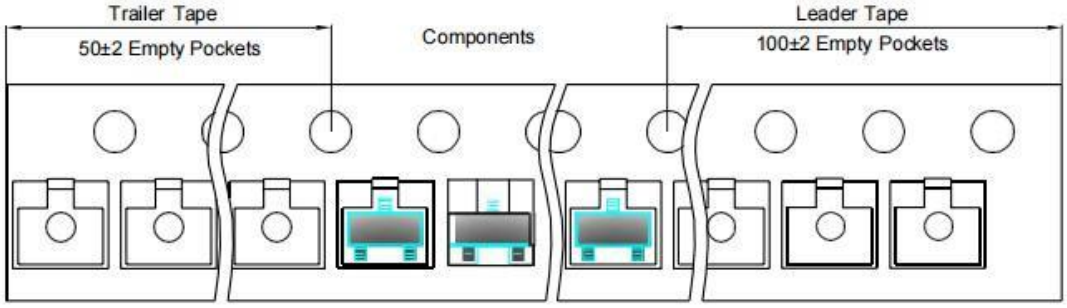


Packaging Description:

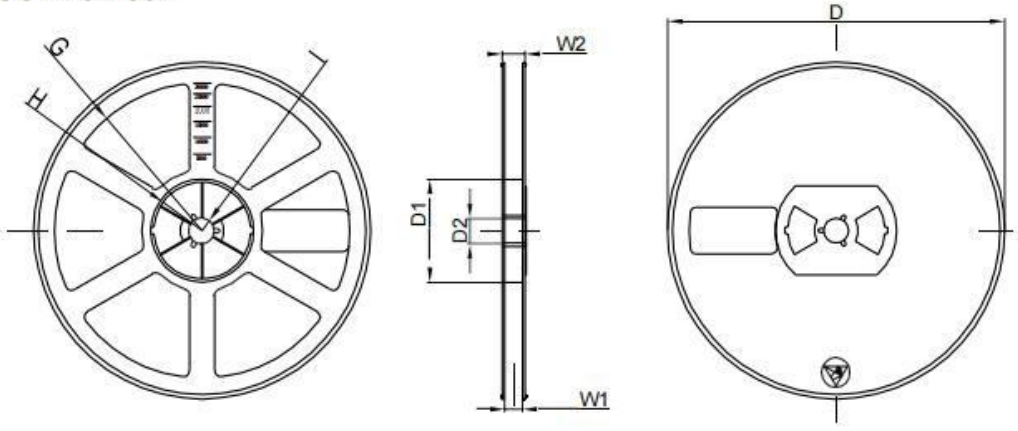
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	

Date of change	Rev #	revise content
2023/07/31	A/0	/