BSS139

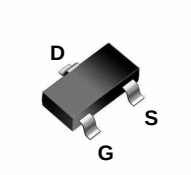
N-Channel Enhanceme Mode Field Effect Transistor

V_{DSS}	50 V
I_D	0.22 A
$R_{DS(ON)}$	1.7 mΩ

FEATURES

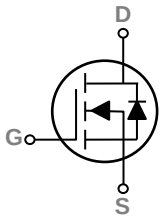
High density cell design for low $R_{DS(ON)}$
Voltage controlled small signal switch
Rugged and reliable
High saturation current capability

M8W



SOT23 top view

Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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	$R_{\theta JA}$	357	℃/W
Operating Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-55 ~+150	

Electrical Characteristics T_J=25°C unless otherwise noted

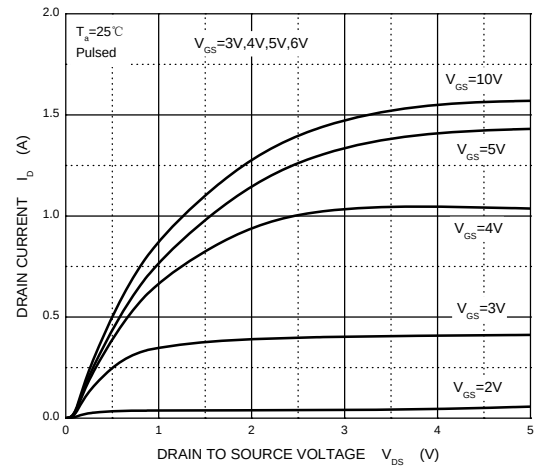
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	50			V
Gate-body leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±10	μA
Zero gate voltage drain current	I_{DSS}	V_{DS} =50V, V_{GS} =0V			0.5	μA
		V_{DS} =30V, V_{GS} =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:

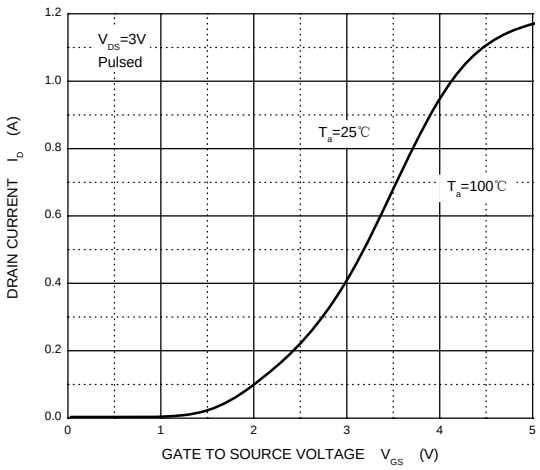
1. Pulse Test ; Pulse Width ≤300μs, Duty Cycle ≤2%.
2. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES

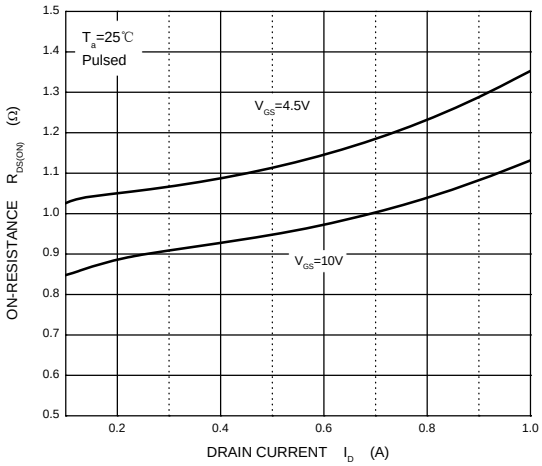
Output Characteristics



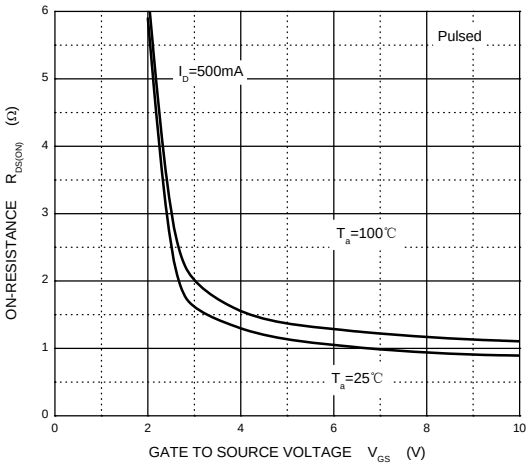
Transfer Characteristics



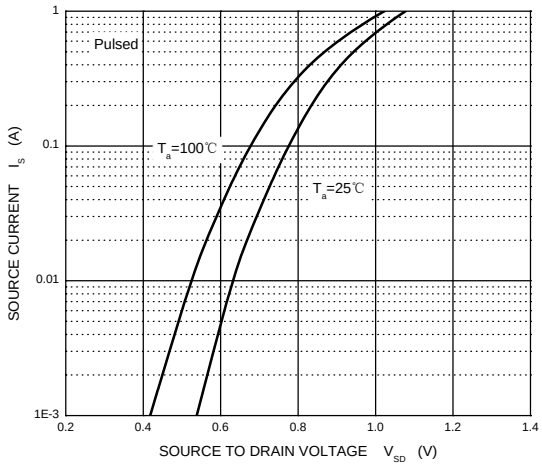
$R_{DS(ON)}$ — I_D



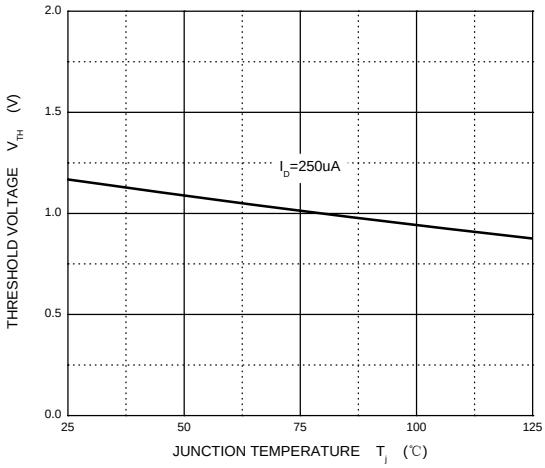
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



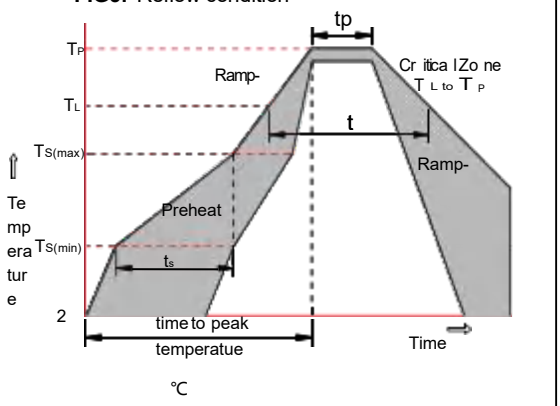
Threshold Voltage



Soldering parameters

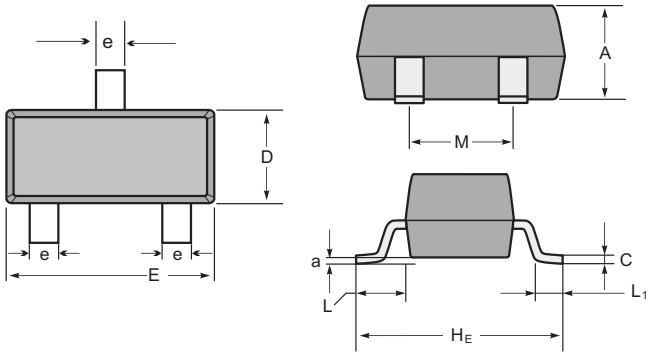
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

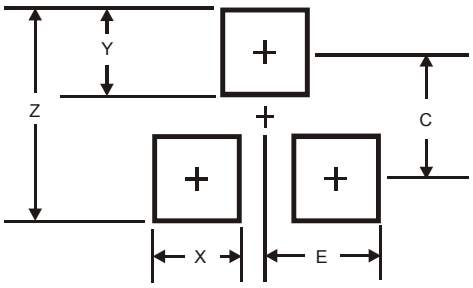
FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOT23





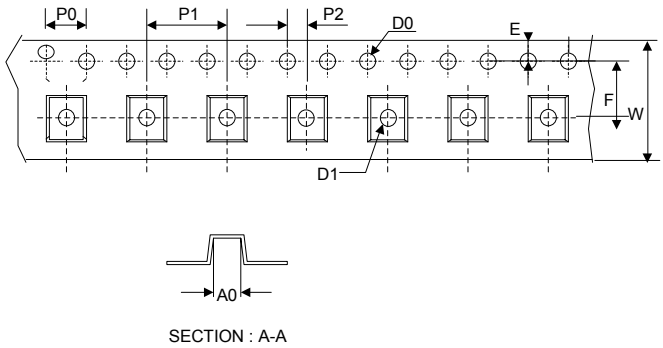
SOT-23 mechanical data

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

Dimensions	SOT23
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

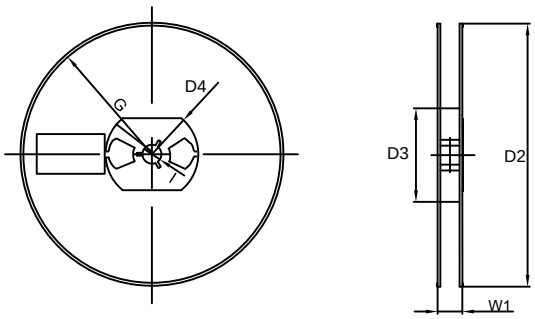
Tape & rell specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	1.55±0.10
D1	1.05±0.10
E	1.55±0.10
F	3.60±0.10
W	8.00±0.10
A0	3.80±0.20
B0	3.25±0.20
K0	1.45±0.10
T	0.25±0.05

7” Reel



D2	178.0±3.0
D3	55Min.
D4	R24.0±3.0
G	R82.0±3.0
I	13.0±2.0
W1	11.0±3.0

Quantity: 3000PCS

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