



Micro Commercial Components



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# BSS138

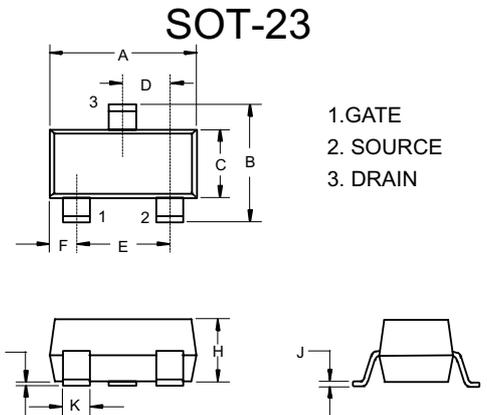
## N-Channel Enhancement Mode Field Effect Transistor

### Features

- Halogen free available upon request by adding suffix "-HF"
- High dense cell design for extremely low  $R_{DS(ON)}$
- Rugged and reliable
- Lead free product is acquired
- SOT-23 Package
- Marking Code: SS
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

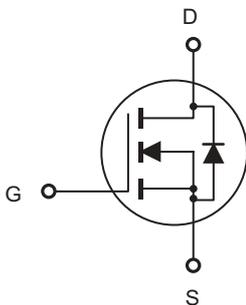
### Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	50	V
$I_D$	Drain Current-Continuous	0.22	A
$V_{GS}$	Gate-source Voltage	$\pm 20$	V
$P_D$	Total Power Dissipation	0.35	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient <sup>b</sup>	357	°C/W
$T_J$	Operating Junction Temperature	-55 to +150	°C
$T_{STG}$	Storage Temperature	-55 to +150	°C

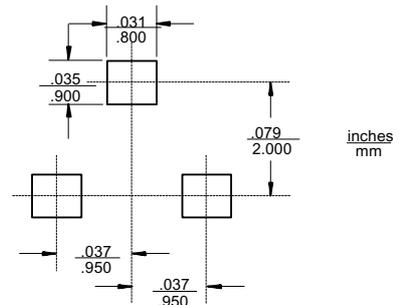


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.098	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Internal Block Diagram



### Suggested Solder Pad Layout



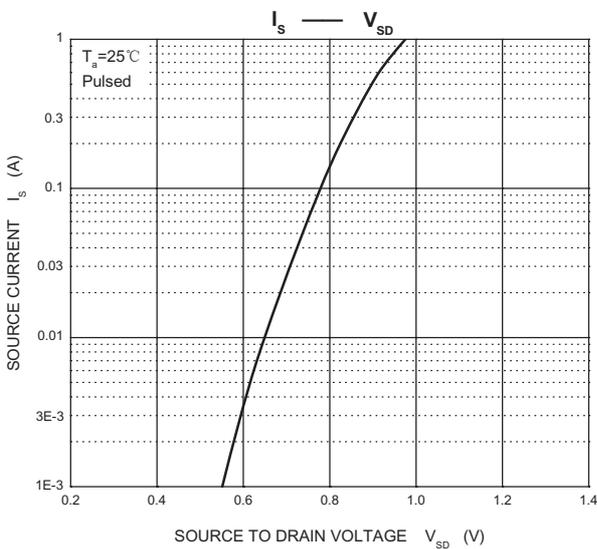
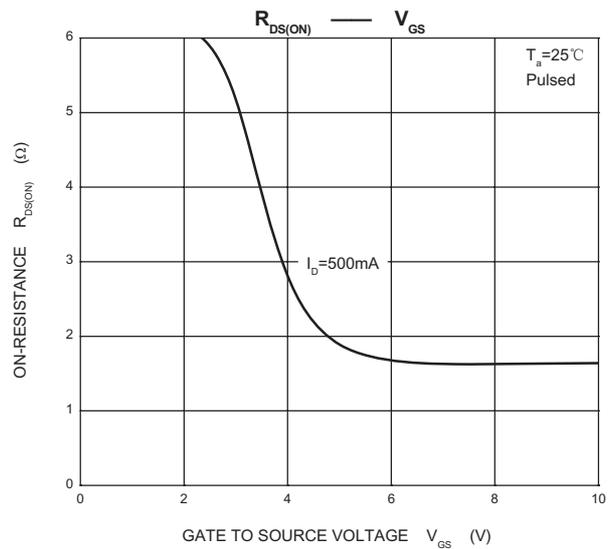
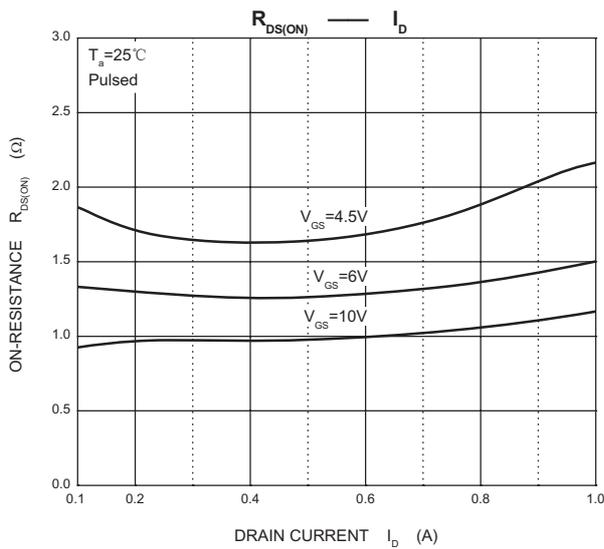
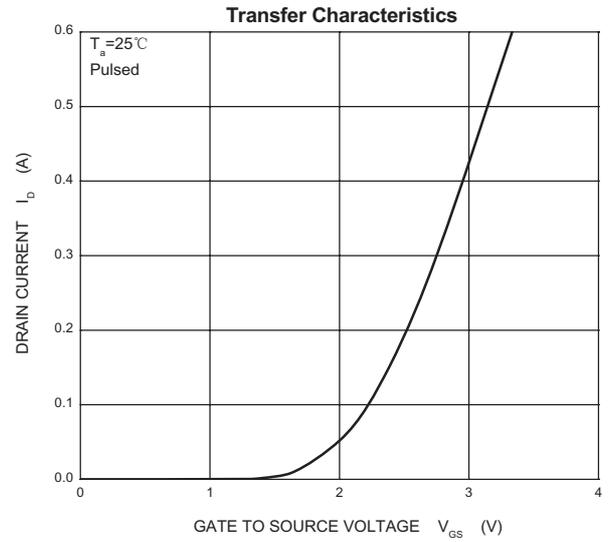
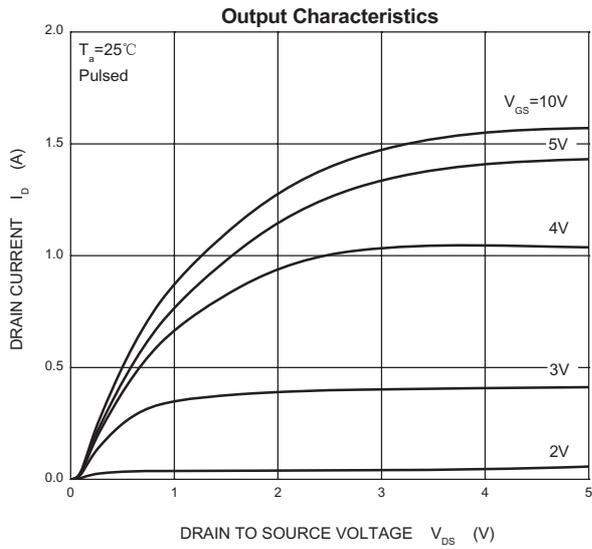
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## Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Off characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	50			V
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V			0.5	μA
		V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			100	nA
<b>On characteristics</b>						
Gate-threshold voltage (note 1)	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA	0.80		1.50	V
Static drain-source on-resistance (note 1)	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.22A			3.50	Ω
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.22A			6	
Forward transconductance (note 1)	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.22A	0.12			S
<b>Dynamic characteristics (note 2)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz		27	60	pF
Output capacitance	C <sub>oss</sub>			13	20	
Reverse transfer capacitance	C <sub>rss</sub>			6	15	
<b>Switching characteristics</b>						
Turn-on delay time (note 1,2)	t <sub>d(on)</sub>	V <sub>DD</sub> = 30V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.29A, R <sub>GEN</sub> = 6Ω			5	ns
Rise time (note 1,2)	t <sub>r</sub>				18	
Turn-off delay time (note 1,2)	t <sub>d(off)</sub>				36	
Fall time (note 1,2)	t <sub>f</sub>				14	
<b>Drain-source body diode characteristics</b>						
Body diode forward voltage (note 1)	V <sub>SD</sub>	I <sub>S</sub> = 0.44A, V <sub>GS</sub> = 0V			1.4	V

### Notes:

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





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### Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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