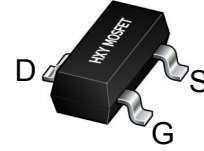




## Description

The BSN20 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

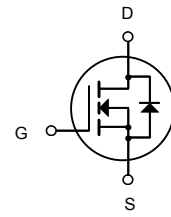


**SOT-23**

## General Features

$V_{DS} = 50V$   $I_D = 0.5A$

$R_{DS(ON)} < 2\Omega @ V_{GS}=10V$



N-Channel MOSFET

## Application

Battery protection

Load switch

Uninterruptible power supply

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
BSN20	SOT-23	M8W	3000

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	50	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current ( $T_J = 150^\circ\text{C}$ )	$T_A = 25^\circ\text{C}$	0.5
		$T_A = 100^\circ\text{C}$	0.29
$I_{DM}$	Drain Current-Pulsed (Note 1)	1.2	A
$P_D$	Maximum Power Dissipation	0.6	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	200	$^\circ\text{C/W}$



**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

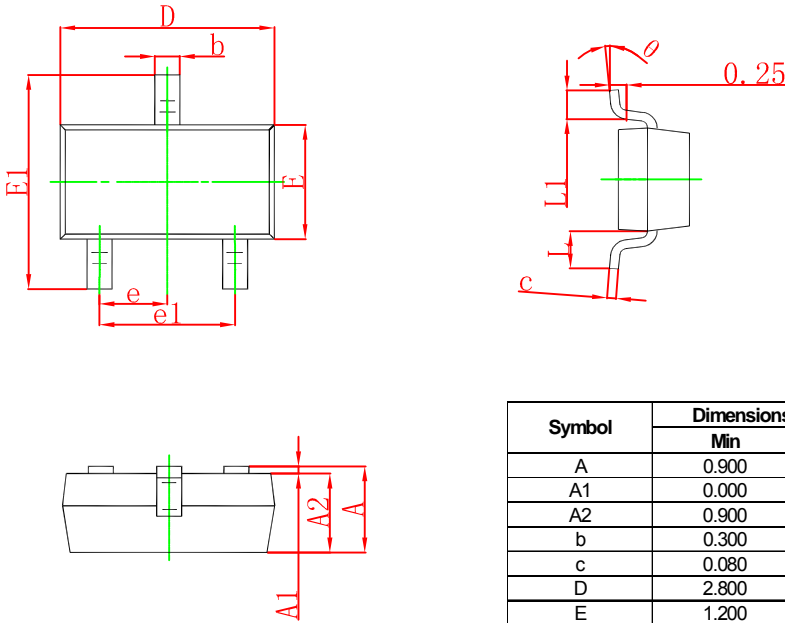
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source breakdown voltage	<b>V(BR)DSS</b>	VGS = 0V, ID = 250μA	50			V
Gate-source threshold voltage	<b>VGS(th)</b>	VDS = VGS, ID = 250μA	1.0		3	V
Gate-source leakage	<b>IGSS</b>	VDS = 0V, VGS = ±20V			±100	nA
Zero gate voltage drain current	<b>IDSS</b>	VDS = 50V, VGS = 0V			0.5	μA
Drain-source on-state resistance	<b>RDS(on)</b>	VGS = 10V, ID = 500mA		1.2	2	Ω
		VGS = 4.5V, ID = 200mA		1.3	2.2	Ω
Forward transconductance	<b>gfs</b>	VDS = 10V, ID = 0.2A	80			mS
Diode forward voltage	<b>VSD</b>	IS=0.5A, VGS=0V		0.85	1.5	V
<b>Dynamic</b>						
Input capacitance	<b>Ciss</b>	VDS = 10V, VGS = 0V, f=1MHz		22		pF
Output capacitance	<b>Coss</b>			6		pF
Reverse transfer capacitance	<b>Crss</b>			4		pF
Total gate charge	<b>Qg</b>	VDS = 25V, VGS = 10V, ID = 0.5A		800		nC
Gate-source charge	<b>Qgs</b>			100		nC
Gate-drain charge	<b>Qgd</b>			100		nC
Gate resistance	<b>Rg</b>	f=1MHz		49		Ω
<b>Switching</b>						
Turn-on delay time	<b>td(on)</b>	VDD= 25V RL=25Ω, ID =0.5A, VGEN= 10V, Rg=50Ω		3		ns
Rise time	<b>tr</b>			3.1		ns
Turn-off delay time	<b>td(off)</b>			9.5		ns
Fall time	<b>tf</b>			8.3		ns
<b>Drain-source body diode characteristics</b>						
Continuous Source-Drain Diode Current	<b>IS</b>	Tc=25°C			0.194	A
Pulsed Diode forward Current	<b>ISM</b>				1.2	A

**Note :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

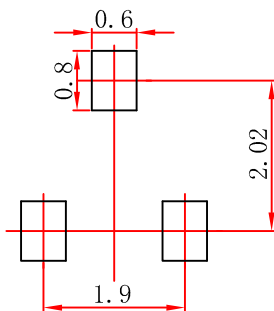


## SOT-23 Package Outline Dimensions



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:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.



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