

**BSS138-Q**

Preliminary

Power MOSFET

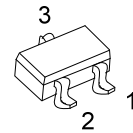
**N-CHANNEL LOGIC LEVEL
ENHANCEMENT MODE****DESCRIPTION**

This device employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

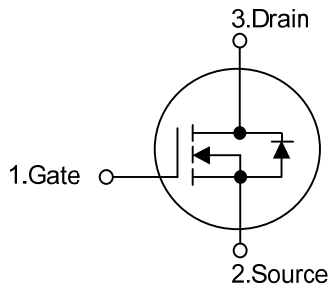
Optimized for switching applications, this device improves the overall efficiency of DC/DC converters and allows operation to higher switching frequencies.

FEATURES

- * $R_{DS(ON)} \leq 3.5 \Omega$ @ $V_{GS}=10V$, $I_D=0.22A$
- * $R_{DS(ON)} \leq 6.0 \Omega$ @ $V_{GS}=4.5V$, $I_D=0.22A$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified



SOT-23-3
(JEDEC TO-236)

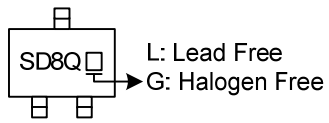
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BSS138L-AE2-R	BSS138G-AE2-R	SOT-23-3	G	S	D	Tape Reel

Note: Pin Assignment: G: Gate S: Source D: Drain

BSS138G-AE2-R		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) AE2: SOT-23-3
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ **ABSOLUTE MAXIMUM RATINGS** ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	50	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	DC	I_D	0.22	A
	Pulse		0.88	A
Peak Diode Recovery dv/dt		dv/dt	3	V/ns
Power Dissipation		P_D	0.36	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	350	$^\circ\text{C/W}$

■ **ELECTRICAL CHARACTERISTICS** ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	50			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =50V, V _{GS} =0V			0.5	μA
		V _{DS} =30V, V _{GS} =0V			0.1	
Gate-Body Leakage, Forward	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
ON CHARACTERISTICS (Note)						
Gate-Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =1m A	0.5		2.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10 V, I _D =0.22A			3.5	Ω
		V _{GS} =4.5 V, I _D =0.22A			6.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		17		pF
Output Capacitance	C _{OSS}			9		pF
Reverse Transfer Capacitance	C _{RSS}			4		pF
SWITCHING PARAMETERS (Note)						
Total Gate Charge	Q _G	V _{DS} =25V, V _{GS} =10V, I _D =0.22A		7.8		nC
Gate Source Charge	Q _{GS}			1.6		nC
Gate Drain Charge	Q _{GD}			0.4		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =30V, I _D =0.29A, V _{GS} =10V, R _G =6Ω,		1.6		ns
Turn-ON Rise Time	t _R			16		ns
Turn-OFF Delay Time	t _{D(OFF)}			5		ns
Turn-OFF Fall-Time	t _F			14		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Max. Diode Forward Current	I _S				0.22	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S =0.44A (Note)		0.9	1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =0.22A,		36		ns
Reverse Recovery Charge	Q _{rr}	d _i /d _t =100A/μs		5.5		nC

Note: Pulse test, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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