



BSS138KW

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

* $R_{DS(ON)} \leq 1.8 \Omega$ @ $V_{GS}=10V$, $I_D=0.22A$

$R_{DS(ON)} \leq 2.4 \Omega$ @ $V_{GS}=4.5V$, $I_D=0.22A$

$R_{DS(ON)} \leq 6.5 \Omega$ @ $V_{GS}=2.5V$, $I_D=0.20A$

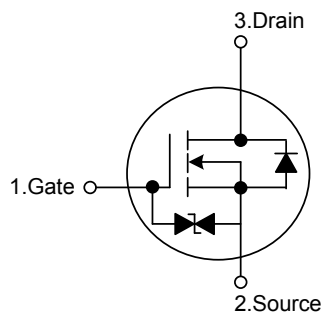
* Low Capacitance

* Low Gate Charge

* Fast Switching Capability

* Avalanche Energy Specified

SYMBOL



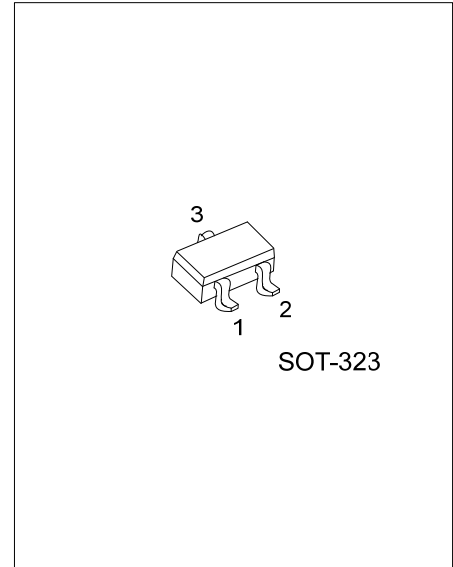
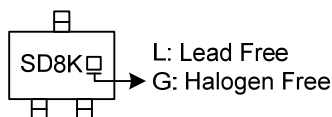
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BSS138KWL-AL3-R	BSS138KWG-AL3-R	SOT-323	G	S	D	Tape Reel

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

BSS138KWG-AL3-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) AL3: SOT-323
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	DC	0.22	A
	Pulse	0.88	A
Peak Diode Recovery dv/dt	dv/dt	4.8	V/ns
Power Dissipation	P_D	0.2	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}	625 (Note)	$^\circ\text{C/W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, 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	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
		V _{DS} =30V, V _{GS} =0V			0.5	μA
Gate-Body Leakage, Forward	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	uA
ON CHARACTERISTICS (Note)						
Gate-Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =1mA	0.5	0.9	1.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =0.22A		1.3	1.8	Ω
		V _{GS} =4.5V, I _D =0.22A		1.5	2.4	Ω
		V _{GS} =2.5V, I _D =0.20A		2.2	6.5	Ω
On-State Drain Current	I _{D(ON)}	V _{GS} =10 V, V _{DS} =5V	0.2			A
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		16.7		pF
Output Capacitance	C _{OSS}			10.2		pF
Reverse Transfer Capacitance	C _{RSS}			4.5		pF
SWITCHING PARAMETERS (Note)						
Total Gate Charge	Q _G	V _{DS} =40V, V _{GS} =10V, I _D =0.22A		8.2		nC
Gate Source Charge	Q _{GS}			1.1		nC
Gate Drain Charge	Q _{GD}			0.3		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =30V, I _D =0.22A,V _{GS} =10V, R _G =6Ω		0.8		ns
Turn-ON Rise Time	t _R			16		ns
Turn-OFF Delay Time	t _{D(OFF)}			6.4		ns
Turn-OFF Fall-Time	t _F			13		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		0.8	1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =0.22A,		18		ns
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μs		12		nC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

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