

**BSS138**

Preliminary

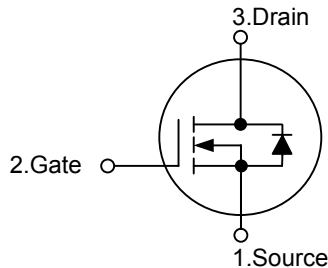
Power MOSFET**N-CHANNEL LOGIC LEVEL
ENHANCEMENT MODE****DESCRIPTION**

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

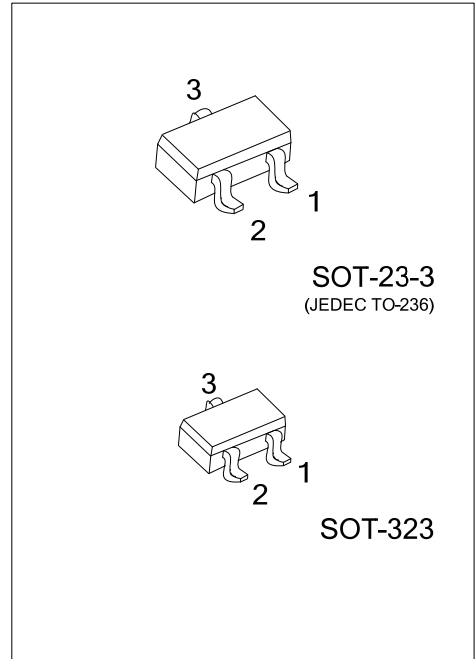
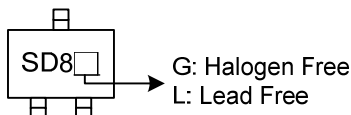
- * $R_{DS(ON)}=0.7\Omega$ @ $V_{GS}=10V$
- * $R_{DS(ON)}=1\Omega$ @ $V_{GS}=4.5V$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BSS138L-AE2-R	BSS138G-AE2-R	SOT-23-3	S	G	D	Tape Reel
BSS138L-AL3-R	BSS138G-AL3-R	SOT-323	S	G	D	Tape Reel

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

	(1) Packing Type
	(2) Package Type
	(3) Lead Free
(1) R: Tape Reel (2) AE2: SOT-23-3. AL3: SOT-323 (3) G: Halogen 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}	50	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	DC	I_D	0.22	A
	Pulse		0.88	
Power Dissipation	SOT-23-3	P_D	0.36	W
	SOT-323		0.15	
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	SOT-23-3	θ_{JA}	350	$^\circ\text{C/W}$
	SOT-323		833	

■ 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	50			V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		72		mV/°C
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	0.8	1.3	1.5	V
Gate Threshold Voltage Temperature Coefficient	ΔV _{GS(TH)} /ΔT _J	I _D =1mA, Referenced to 25°C		-2		mV/°C
Static Drain–Source On–Resistance	R _{DS(ON)}	V _{GS} =10 V, I _D =0.22A		0.7	3.5	Ω
		V _{GS} =4.5 V, I _D =0.22A		1.0	6.0	
On-State Drain Current	I _{D(ON)}	V _{GS} =10 V, V _{DS} =5V	0.2			A
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =0.22A	0.12	0.5		S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		27		pF
Output Capacitance	C _{OSS}			13		pF
Reverse Transfer Capacitance	C _{RSS}			6		pF
SWITCHING PARAMETERS (Note)						
Total Gate Charge	Q _G	V _{DS} =25V, V _{GS} =10V, I _D =0.22A		1.7	2.4	nC
Gate Source Charge	Q _{GS}			0.1		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,		2.5	5	ns
Turn-ON Rise Time	t _R			9	18	ns
Turn-OFF Delay Time	t _{D(OFF)}			20	36	ns
Turn-OFF Fall-Time	t _F			7	14	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S =0.44A (Note)		0.8	1.4	V
Max. Diode Forward Current	I _S				0.22	A

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

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.