



BSS169

Power MOSFET

N-CHANNEL DEPLETION-MODE SMALL SIGNAL TRANSISTOR

DESCRIPTION

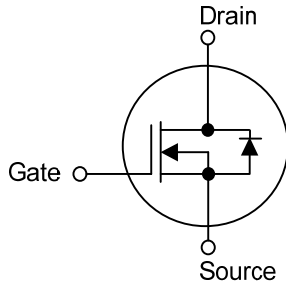
This device employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

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

FEATURES

- * $R_{DS(ON)} \leq 20 \Omega$ @ $V_{GS}=0V$, $I_D=0.05A$
- $R_{DS(ON)} \leq 10 \Omega$ @ $V_{GS}=10V$, $I_D=0.2A$
- * Depletion mode
- * dv/dt rated

SYMBOL

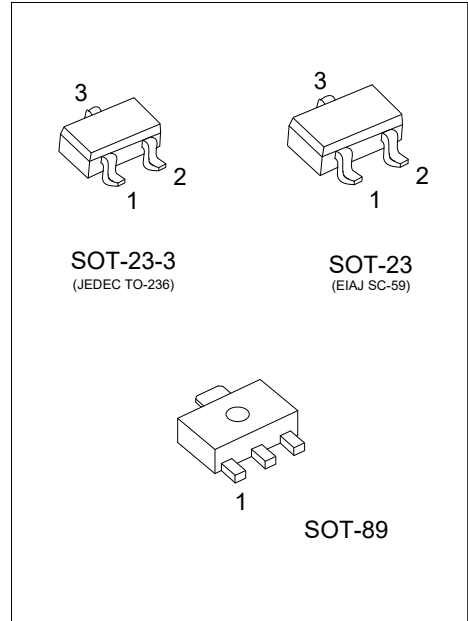


ORDERING INFORMATION

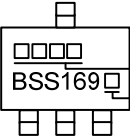
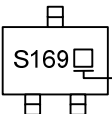
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BSS169L-AB3-R	BSS169G-AB3-R	SOT-89	G	D	S	Tape Reel
BSS169L-AE2-R	BSS169G-AE2-R	SOT-23-3	G	S	D	Tape Reel
BSS169L-AE3-R	BSS169G-AE3-R	SOT-23	G	S	D	Tape Reel

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

	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AB3: SOT-89, AE2: SOT-23-3, AE3: SOT-23
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING

SOT-89	SOT-23-3 / SOT-23
 <p>Diagram of SOT-89 package marking. The package is a small rectangle with a notch on the top edge. The marking 'BSS169' is printed on the top surface. To the right of the package, there are three arrows pointing to the marking: the top arrow points to 'BSS169', the middle arrow points to 'L: Lead Free', and the bottom arrow points to 'G: Halogen Free'. Above the package, there are three small squares representing the date code.</p> <p>→ Date Code → L: Lead Free → G: Halogen Free</p>	 <p>Diagram of SOT-23-3 / SOT-23 package marking. The package is a small rectangle with a notch on the top edge. The marking 'S169' is printed on the top surface. To the right of the package, there are two arrows pointing to the marking: the top arrow points to 'L: Lead Free' and the bottom arrow points to 'G: Halogen Free'.</p> <p>→ L: Lead Free → G: Halogen Free</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 25	V
Continuous Drain Current	DC	I_D	0.17	A
	Pulse		0.68	A
Power Dissipation	SOT-89	P_D	1	W
	SOT-23-3		0.3	W
	SOT-23			
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 1. 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.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-89	θ_{JA}	125	$^\circ\text{C/W}$
	SOT-23-3		625	$^\circ\text{C/W}$
	SOT-23			

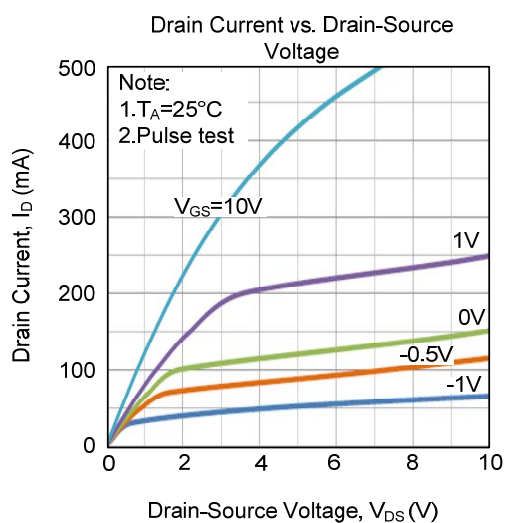
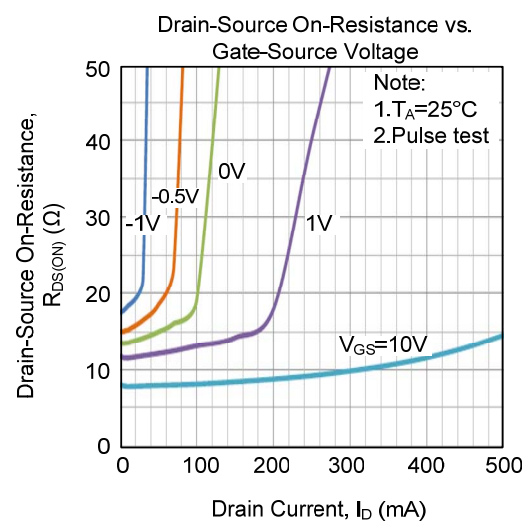
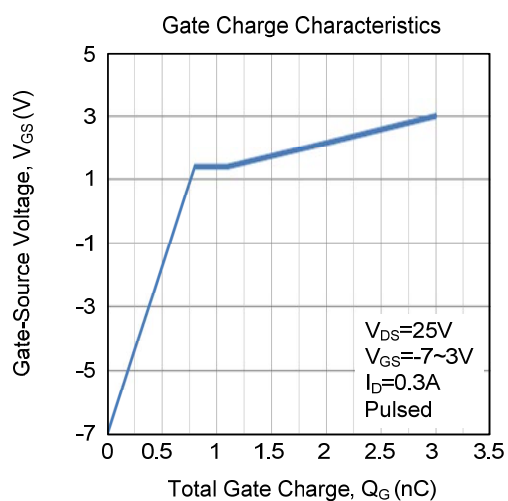
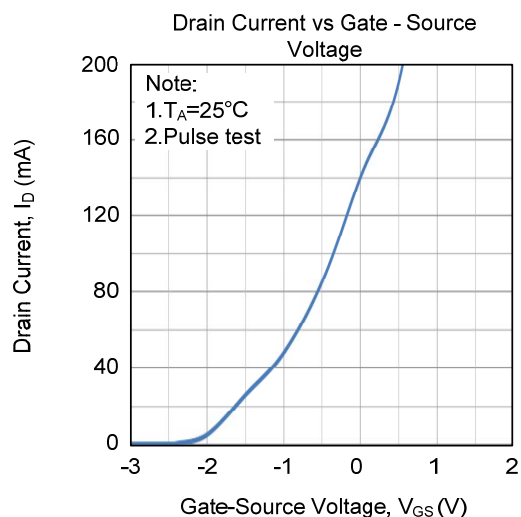
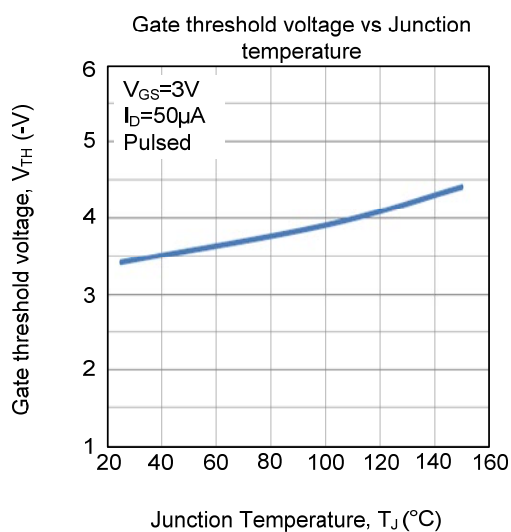
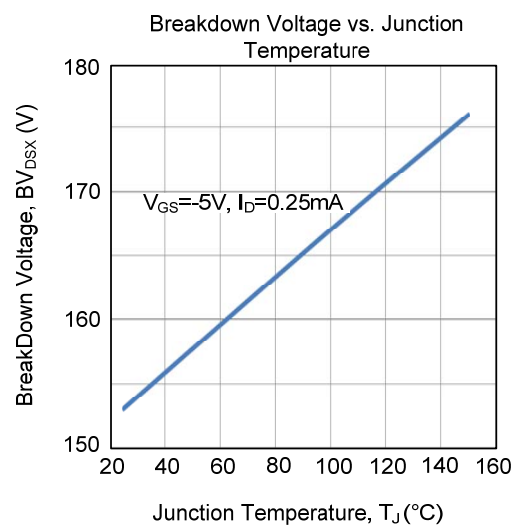
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

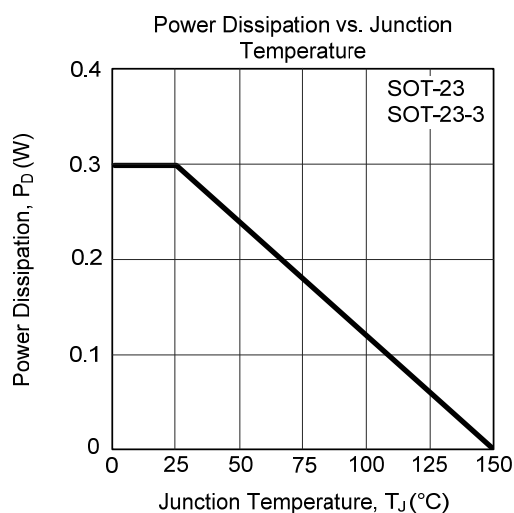
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =-5V, I _D =250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =5V, V _{GS} =0V	70			mA
Gate-Body Leakage, Forward	I _{GSS}	V _{DS} =0V, V _{GS} =25V			100	nA
Drain-source cutoff current	I _{D(OFF)}	V _{DS} =100V, V _{GS} =-10V			1	μA
ON CHARACTERISTICS (Note)						
Gate to Source Cut Off Voltage	V _{GS(OFF)}	V _{DS} =3V, I _D =50μA	-2.0		-4.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =0V, I _D =0.05A		10	20	Ω
		V _{GS} =10V, I _D =0.2A		5.0	10	Ω
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =0.15A		0.2		S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =-10V, f=1MHz		28		pF
Output Capacitance	C _{OSS}			18		pF
Reverse Transfer Capacitance	C _{RSS}			8		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =25V, V _{GS} =3~ -7V, I _D =0.3A		3		nC
Gate Source Charge	Q _{GS}			0.8		nC
Gate Drain Charge	Q _{GD}			0.3		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =30V, V _{GS} =3~ -7V, I _D =0.3A, R _G =6Ω		3.2		ns
Turn-ON Rise Time	t _R			6		ns
Turn-OFF Delay Time	t _{D(OFF)}			26		ns
Turn-OFF Fall-Time	t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Max. Diode Forward Current	I _S				0.17	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =-10V, I _S =0.2A (Note)			1.2	V

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

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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