

**BSS308Z**

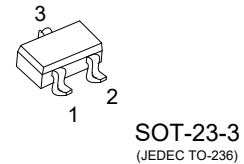
Preliminary

Power MOSFET

**-2.0A, -30V P-CHANNEL
ENHANCEMENT MODE
FIELD-EFFECT
TRANSISTOR(FET)****DESCRIPTION**

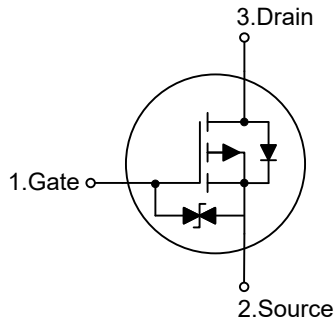
This device employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

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

**FEATURES**

- * $R_{DS(ON)} \leq 88 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -2.0\text{A}$
- * $R_{DS(ON)} \leq 140 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -1.7\text{A}$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * With ESD Protected

- * Avalanche Energy Specified
- * Enhancement mode
- * Logic level
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

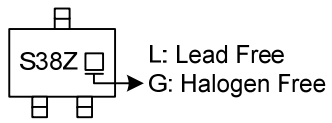
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BSS308ZL-AE2-R	BSS308ZG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

BSS308ZG-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 RATING ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	DC	I_D	-2	A
	Pulsed (Note 2)	I_{DM}	-4	A
Peak Diode Recovery dv/dt (Note 3)		dv/dt	0.9	V/ns
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	32.5	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)		P_D	0.5	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		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.

3. $L = 5\text{mH}$, $I_{AS} = -3.6\text{A}$, $V_{DD} = -25\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$.

4. $I_{SD} \leq -2.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J = 25^{\circ}\text{C}$.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	250 (Note)	$^{\circ}\text{C}/\text{W}$

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

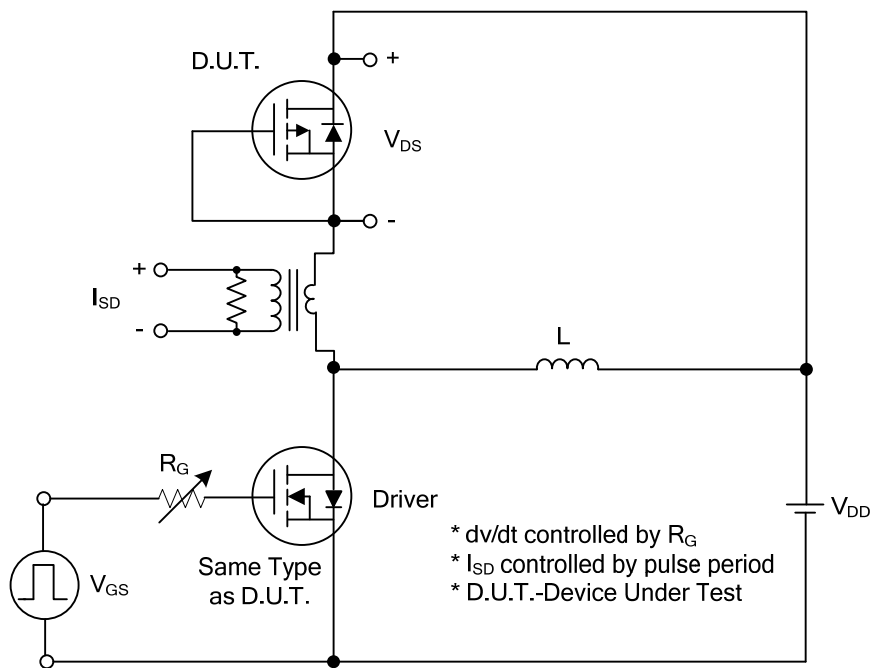
■ **ELECTRICAL CHARACTERISTICS** ($T_A=25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+10	μA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D =-250μA	-1.0		-2.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-2.0A			88	mΩ
			V _{GS} =-4.5V, I _D =-1.7A			140	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		332		pF
Output Capacitance		C _{OSS}			57		pF
Reverse Transfer Capacitance		C _{RSS}			36		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-24V, V _{GS} =-10V, I _D =-2.0A (Note 1, 2)		11		nC
Gate to Source Charge		Q _{GS}			2		nC
Gate to Drain Charge		Q _{GD}			2		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-15V, V _{GS} =-10V, I _D =-2.0A, R _G =3Ω (Note 1, 2)		1		ns
Rise Time		t _R			15		ns
Turn-OFF Delay Time		t _{D(OFF)}			47		ns
Fall-Time		t _F			35		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-2	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				-4	A
Diode Forward Voltage (Note 1)		V _{SD}	I _F =-2.0A, V _{GS} =0V			-1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =-2.0A, V _{GS} =0V,		104		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dl _F /dt =100A/μs		106		nC

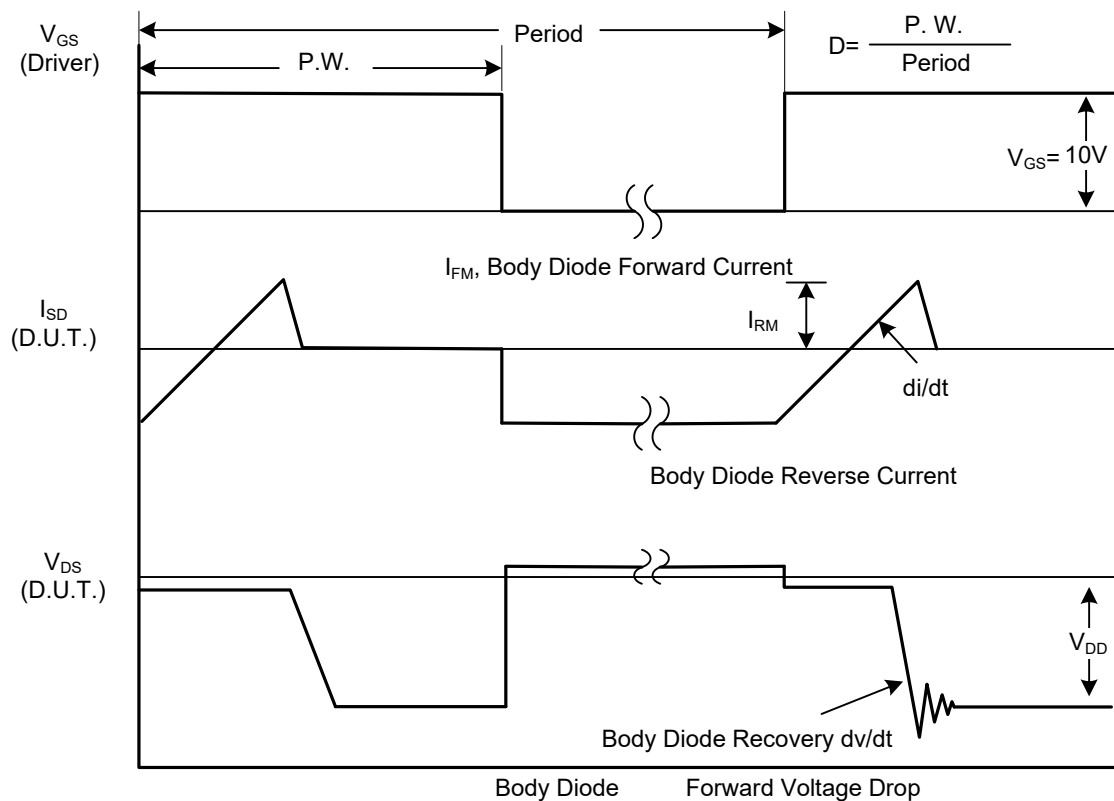
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

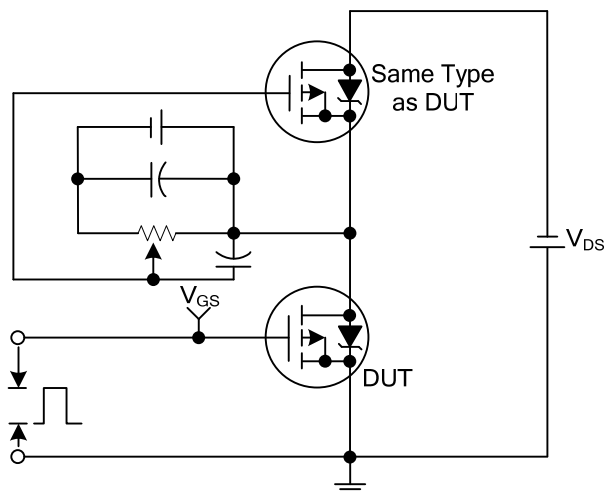


Peak Diode Recovery dv/dt Test Circuit

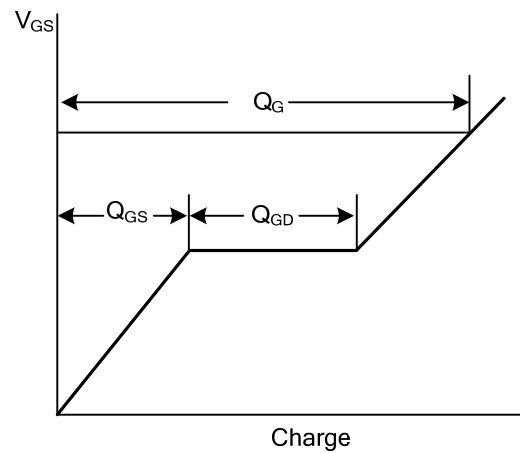


Peak Diode Recovery dv/dt Waveforms

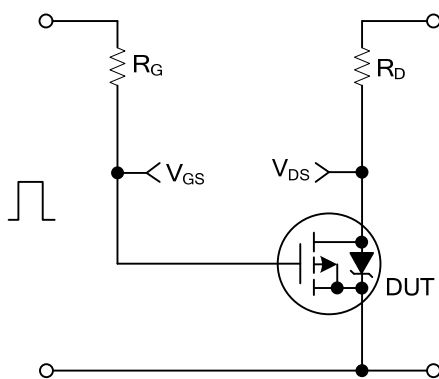
■ TEST CIRCUITS AND WAVEFORMS



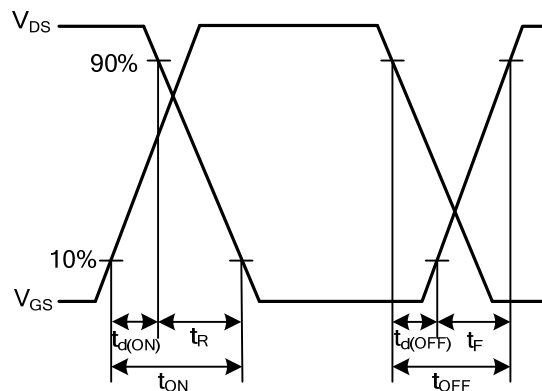
Gate Charge Test Circuit



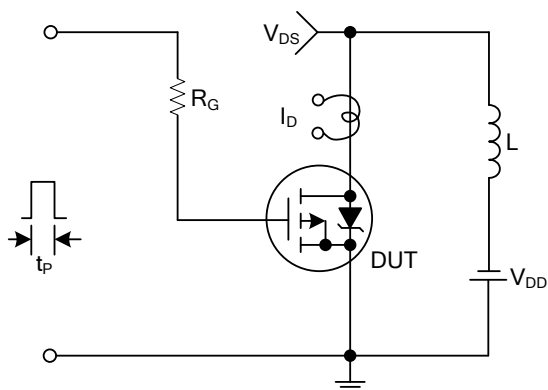
Gate Charge Waveforms



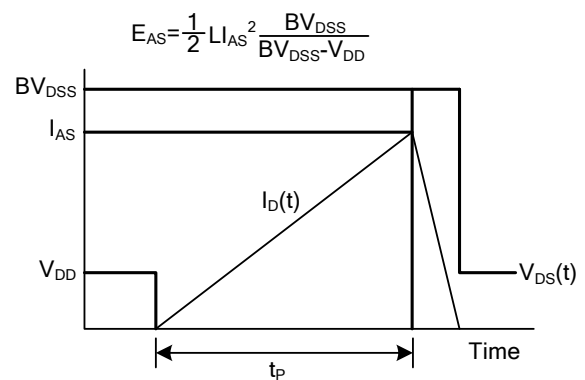
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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