GOOD-ARK SEMICONDUCTOR

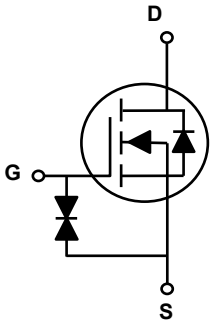
BSS123

100V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	100V
$R_{DS(ON)}$	3.5Ω @10V (Typ)
	4Ω @4.5V (Typ)
I_D	190mA

SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The BSS123 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_A=25°C)	I_D	190	mA
Drain Current-Continuous (T_A=70°C)		150	
Drain Current-Pulsed (T_A=25°C)[1]	I_{DM}	760	mA
Power Dissipation (T_A=25°C)	P_D	0.3	W
Power Dissipation (T_A=70°C)		0.2	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	400	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	100	-	-	V
Zero Gate Voltage Drain Current, T_A=25°C	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	uA
Zero Gate Voltage Drain Current, T_A=125°C		V_{DS}=80V, V_{GS}=0V	-	-	100	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±10	uA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1.0	2.0	3.0	V
Drain-Source On-State Resistance[2]	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.15A	-	3.5	5	Ω
		V_{GS}=4.5V, I_D=0.1A	-	4	6	Ω
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=50V, V_{GS}=10V, I_D=0.2A	-	0.74	-	nC
Gate-Source Charge	Q_{gs}		-	0.08	-	
Gate-Drain Charge	Q_{gd}		-	0.26	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=50V, V_{GS}=10V, R_G=3.3Ω, I_D=0.2A	-	2	-	nS
Rise Time	T_r		-	3.1	-	
Turn-Off Delay Time	$T_{d(off)}$		-	6.5	-	
Fall Time	T_f		-	15	-	
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, F=1MHz	-	31.6	-	pF
Output Capacitance	C_{oss}		-	2.8	-	
Reverse Transfer Capacitance	C_{rss}		-	2	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Source Drain Current (Body Diode)	I_{SD}	T_A=25°C	-	-	0.1	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_{SD}=0.2A, T_J=25°C	-	0.85	1.2	V

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.

Typical Electrical and Thermal Characteristic Curves

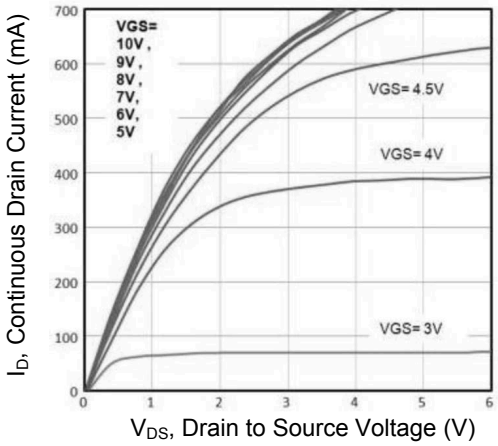


Figure 1. Typical Output Characteristics

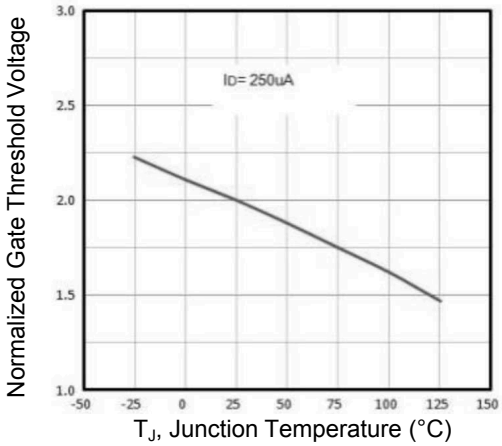


Figure 2. Normalized V_{th} vs. T_J

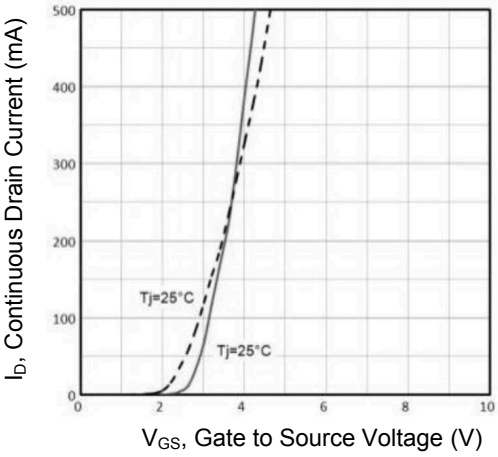


Figure 3. Typical Transfer Characteristics

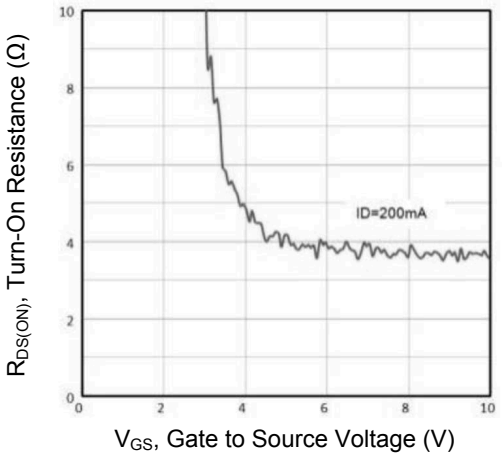


Figure 4. Turn-On Resistance vs. V_{GS}

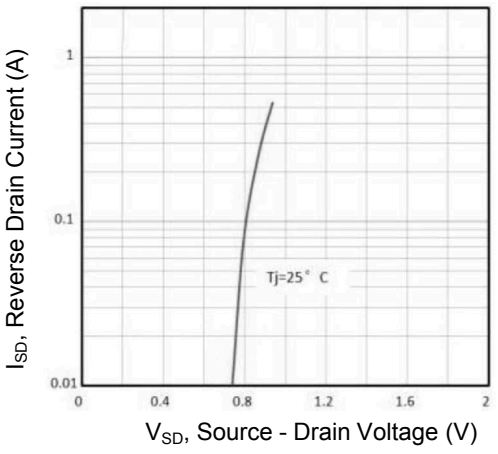


Figure 5. Typical Source - Drain Diode Forward Voltage

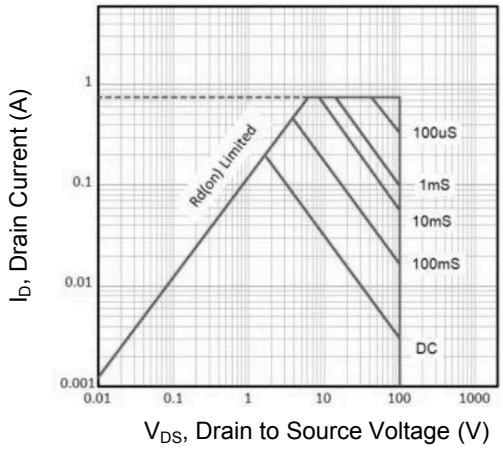


Figure 6. Maximum Safe Operating Area

Typical Electrical and Thermal Characteristic Curves

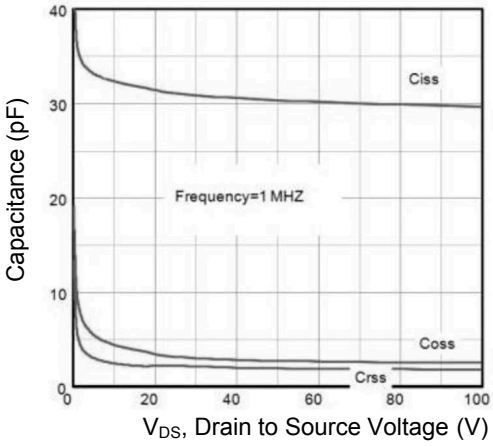


Figure 7. Capacitance Characteristics

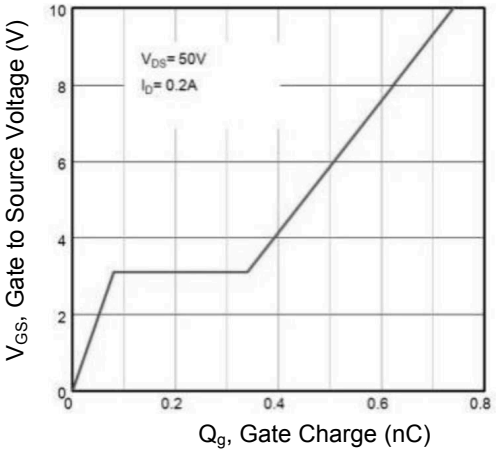


Figure 8. Gate Charge Characteristics

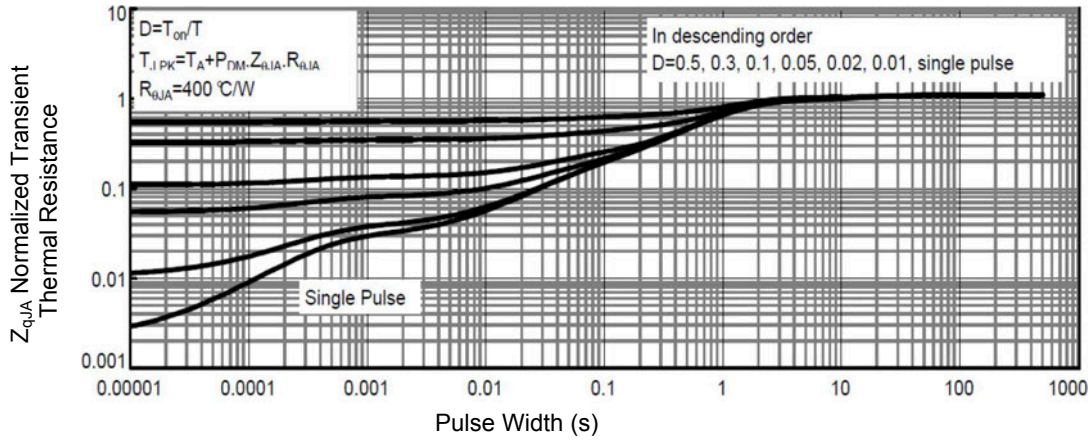


Figure 9. Normalized Maximum Transient Thermal Impedance

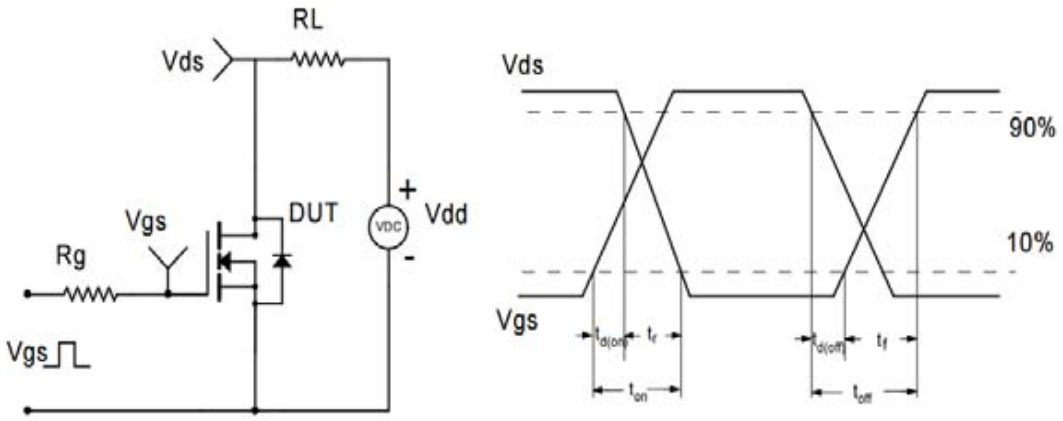
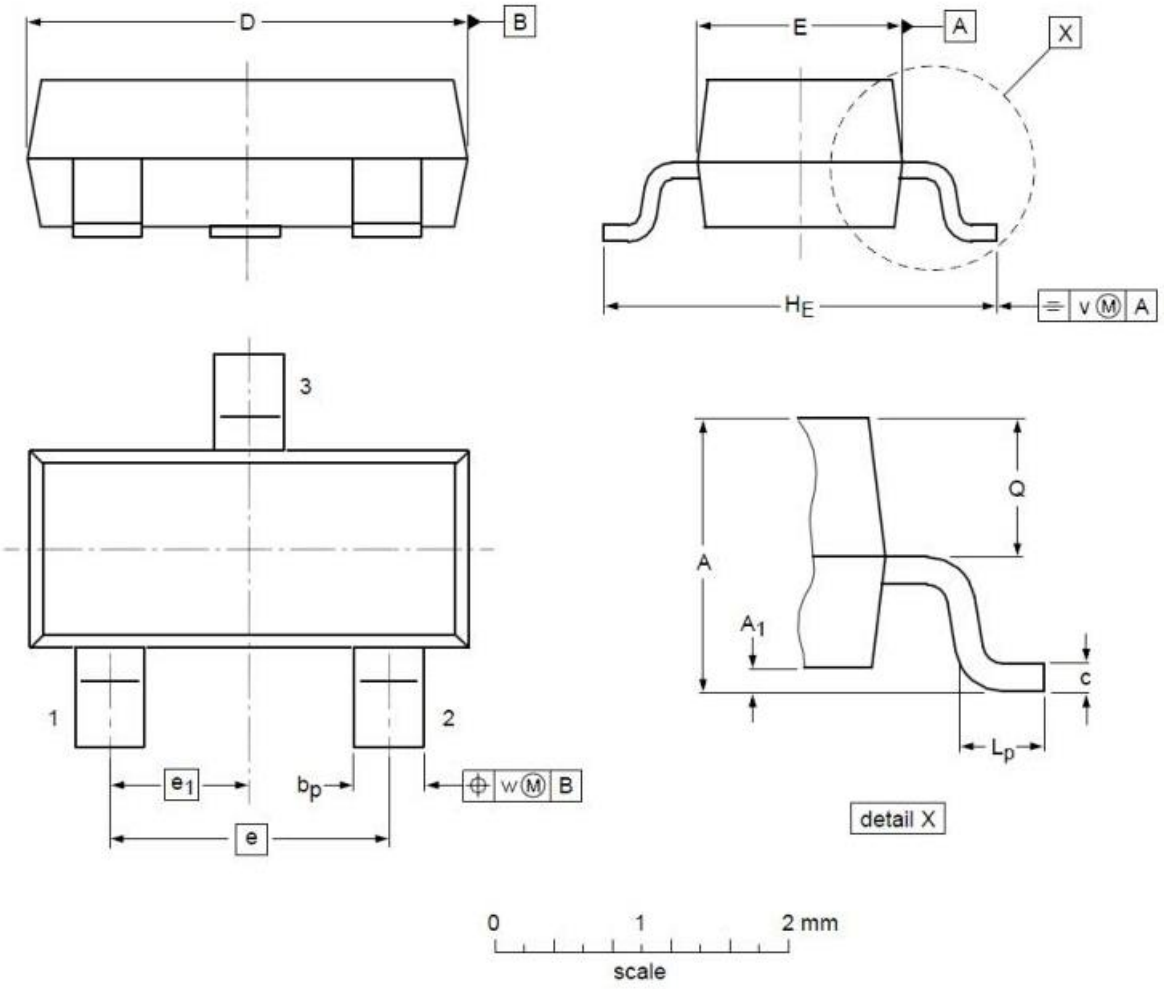


Figure 10. Switching Time Test Circuit and Waveforms

Package Outline Dimensions (SOT-23)



Symbol	Dimensions in Milimeters			Symbol	Dimensions in Milimeters		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.01	1.15	A1	0.01	0.05	0.10
b_P	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	-	1.90	-	e1	-	0.95	-
H_E	2.25	2.40	2.55	L_P	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	-	0.20	-
W	-	0.10	-				