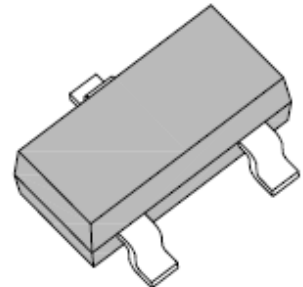


SMD Power MOSFET Transistor (N-Channel)

Features

- Low On-Resistance:3.5Ω
- Low input capacitance:40pF
- Low output capacitance:12pF
- Low threshold:1.5V
- Fast switching speed:20nS
- RoHS Compliance



SOT-23



Application

- DC to DC converter
- Cellular & PCMCIA card
- Cordless telephone
- Power management in portable and battery etc.

Mechanical Data

Case:	SOT-23, Plastic Package
Terminals:	Solderable per MIL-STD-202G, Method 208
Weight:	0.008 gram

Maximum Ratings *(T_{Ambient}=25°C unless noted otherwise)*

Symbol	Description	BSS138	Unit	Conditions
	Marking Code	J1		
V_{DSS}	Drain-Source Voltage	50	V	
V_{GS}	Gate-Source Voltage	± 20	V	
I_D	Drain Current Continuous	200	mA	TA=25° C
I_{DM}	Drain Current Pulsed (tp≤10μS)	800	mA	
P_D	Drain Power Dissipation	225	mW	TA=25° C
R_{thJA}	Thermal Resistance, Junction to Ambient	556	° C/W	
T_J, T_{STG}	Storage Temperature Range	-55 to +150	° C	

SMD Power MOSFET Transistor (N-Channel)

BSS138

Electrical Characteristics ($T_{Ambient}=25^{\circ}C$ unless noted otherwise)

Symbol	Description	Min.	Typ.	Max.	Unit	Conditions
V(BR)DSS	Drain-Source Breakdown Voltage	50	-	-	V	$V_{GS}=0V, I_D=250\mu A$
VGS(th)	Gate-Source Threshold Voltage	0.5	-	1.5	V	$V_{DS}=V_{GS}, I_D=1mA$
IGSS	Gate-Source Leakage Current	-	-	± 0.1	μA	$V_{DS}=0V, V_{GS}=\pm 20V$
IDSS	Zero Gate Voltage Drain Current	-	-	0.1	μA	$V_{DS}=25V, V_{GS}=0V$
		-	-	0.5	μA	$V_{DS}=50V, V_{GS}=0V$
RDS(ON)	Drain-Source On-Resistance	-	5.6	10	Ω	$V_{GS}=2.75V, I_D<200mA, T_A=-40$ to $+85^{\circ}C$
		-	-	3.5	Ω	$V_{GS}=5.0V, I_D=200mA$
gFS	Forward Transconductance	100	-	-	mS	$V_{DS}=25V, I_D=200mA, f=1.0KHz$

Dynamic Characteristics ($T_{Ambient}=25^{\circ}C$ unless noted otherwise)

Symbol	Description	Min.	Typ.	Max.	Unit	Conditions
Ciss	Input Capacitance	-	40	50	pF	$V_{DS}=25V, V_{GS}=0V, f=1MHz$
Crss	Reverse Transfer Capacitance	-	3.5	5.0		
Coss	Output Capacitance	-	12	25		
ton	Switching Time Turn-On Time	-	-	20	nS	$V_{DD}=30V, I_D=200mA$
toff	Switching Time Turn-Off Time	-	-	20		

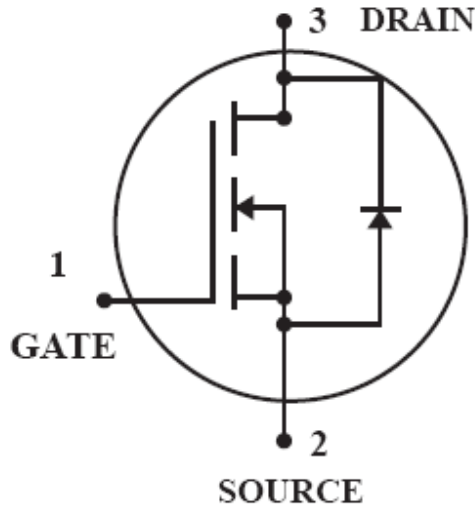
Note: (1) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(2) Switching Time is Essentially Independent of Operating Temperature.

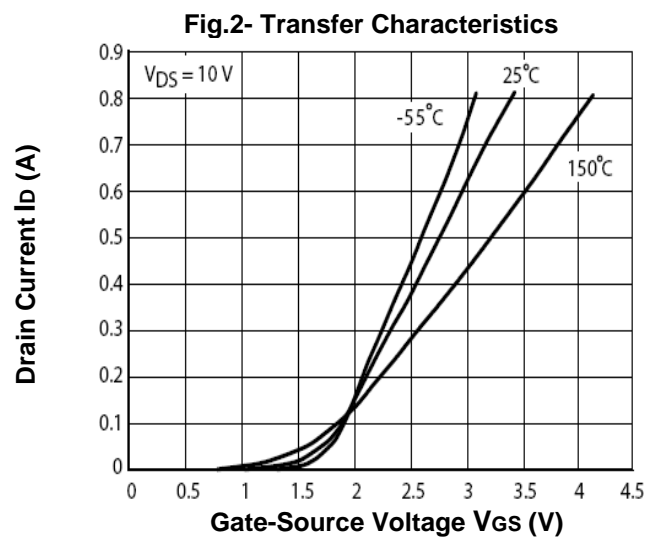
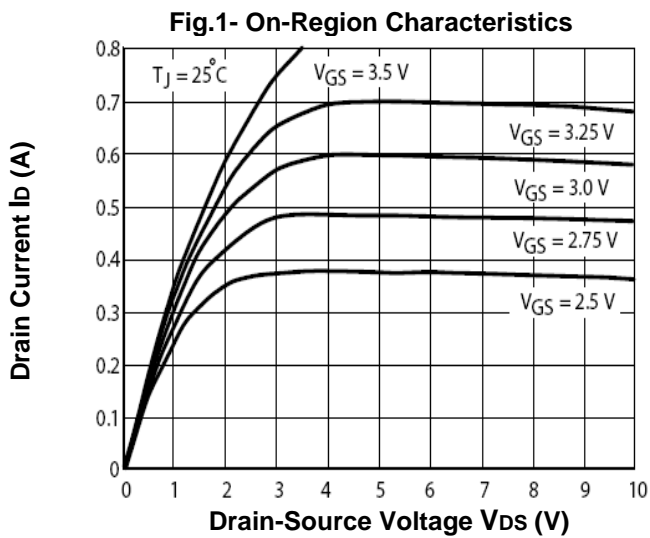
SMD Power MOSFET Transistor (N-Channel)

BSS138

Switching Time Test Circuit



Typical Characteristics Curves



SMD Power MOSFET Transistor (N-Channel)

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Fig.3- On-Resistance Variation with Temperature

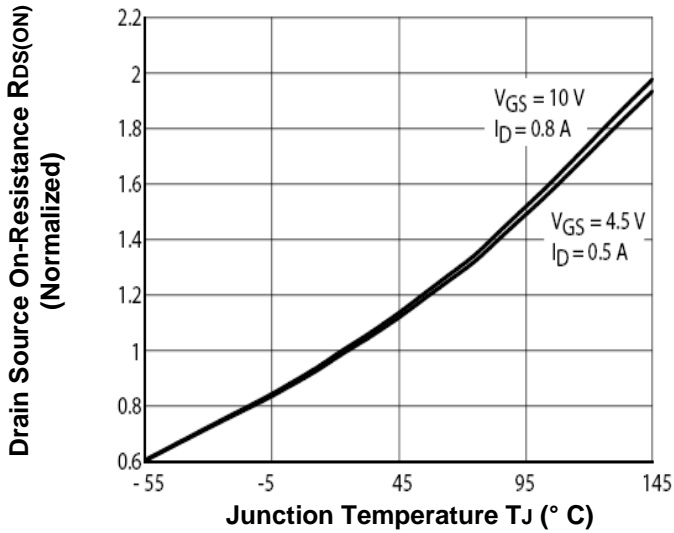


Fig.4- Threshold Voltage Variation with Temperature

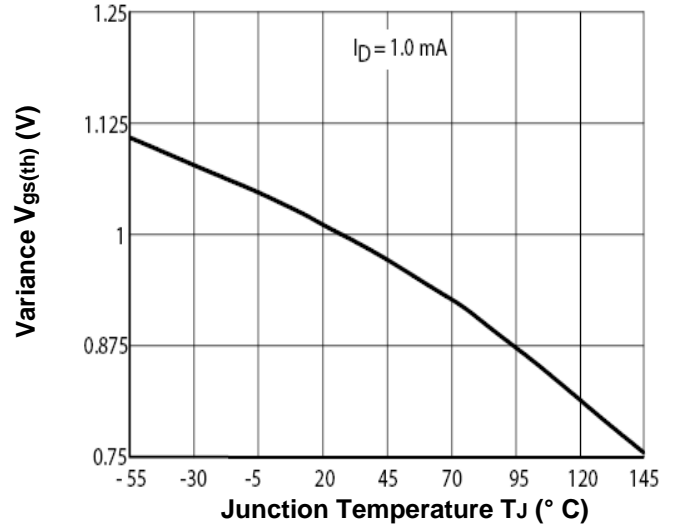


Fig.5- Gate Charge

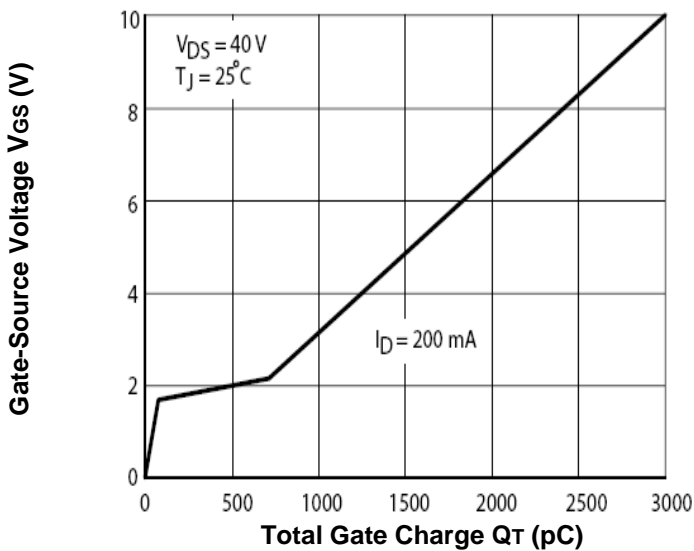
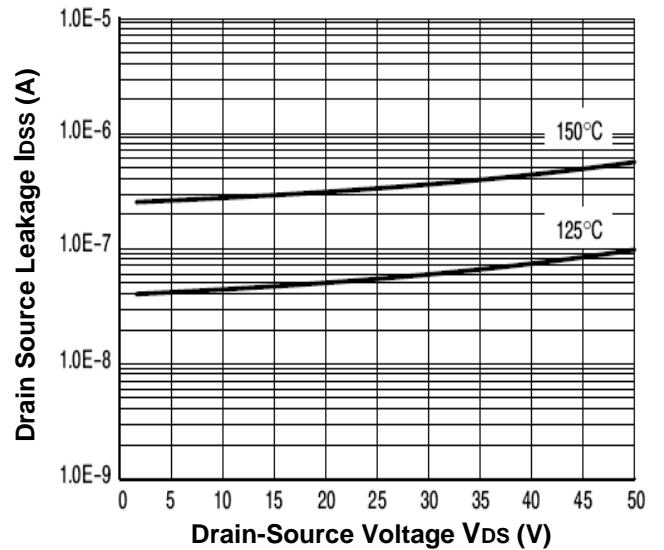


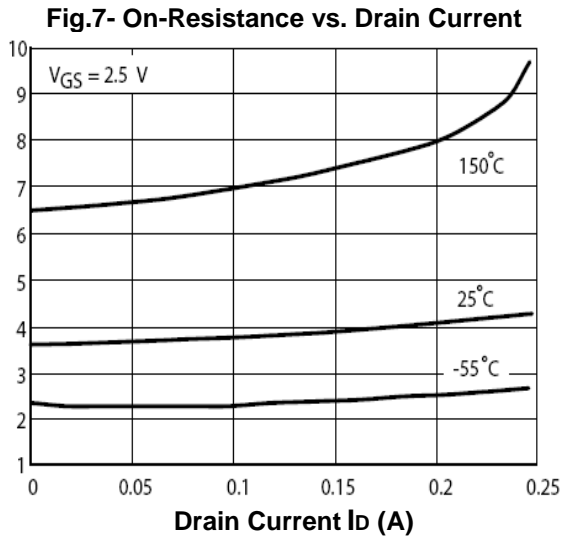
Fig.6- IDSS



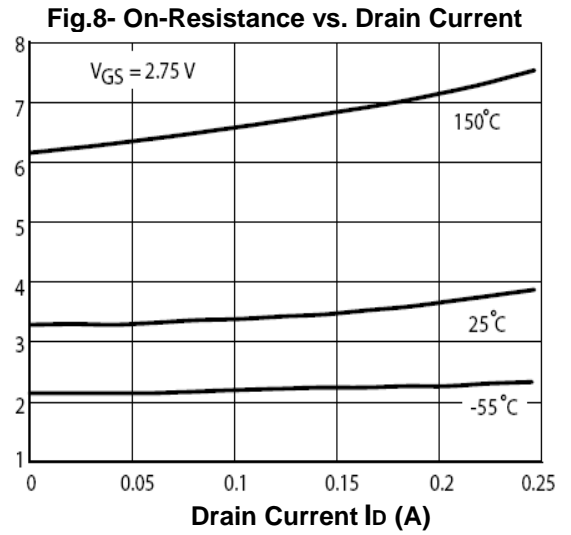
SMD Power MOSFET Transistor (N-Channel)

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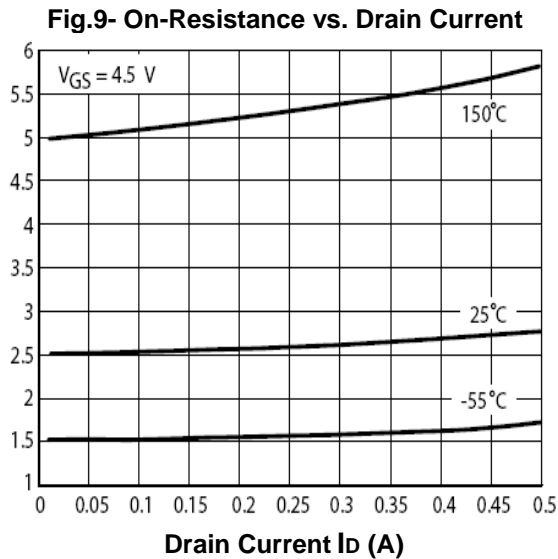
Drain Source On-Resistance $R_{DS(ON)}$ (OHMS)



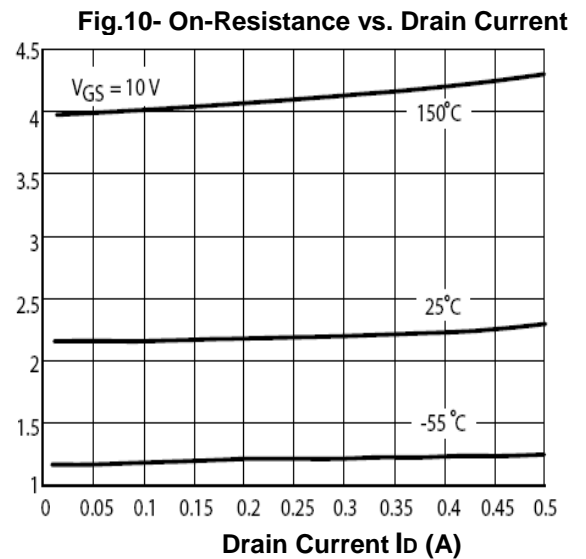
Drain Source On-Resistance $R_{DS(ON)}$ (OHMS)



Drain Source On-Resistance $R_{DS(ON)}$ (OHMS)



Drain Source On-Resistance $R_{DS(ON)}$ (OHMS)



SMD Power MOSFET Transistor (N-Channel)

BSS138

Fig.11- Body Diode Forward Voltage

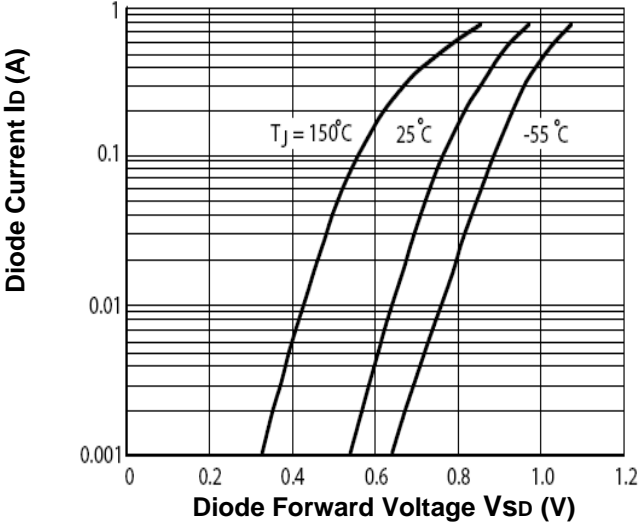
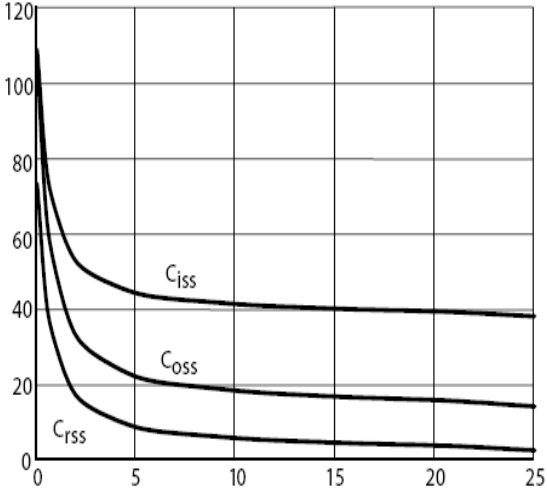
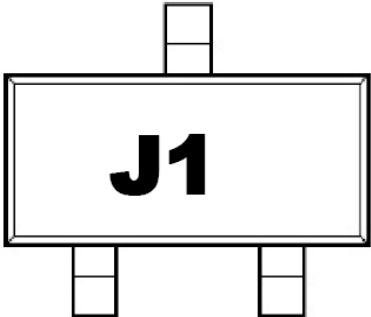


Fig.12- Capacitance



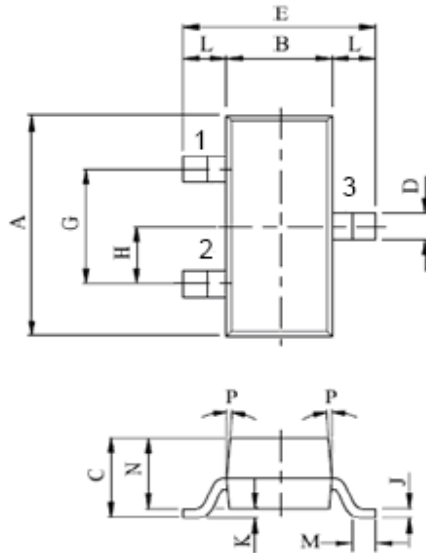
Marking Information:



SMD Power MOSFET Transistor (N-Channel)

BSS138

Dimensions in mm



DIM	MILLIMETERS
A	2.93±0.20
B	1.30+0.20/-0.15
C	1.30 MAX
D	0.45+0.15/-0.05
E	2.40+0.30/-0.20
G	1.90
H	0.95
J	0.13+0.10/-0.05
K	0.00 ~ 0.10
L	0.55
M	0.20 MIN
N	1.00+0.20/-0.10
P	7°

SOT-23

1. Gate
2. Source
3. Drain

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