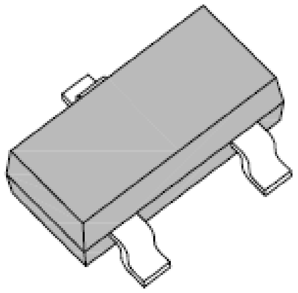
SMD Power MOSFET Transistor (N-Channel)

Features

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



SOT-23

RoHS Compliant

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 $_{Ambient}$=25ºC 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	T_A=25° C
I_{DM}	Drain Current Pulsed (tp≤10μS)	800	mA	
P_D	Drain Power Dissipation	225	mW	T_A=25° C
R_{thJA}	Thermal Resistance, Junction to Ambient	556	° C/W	
T_J, T_{STG}	Storage Temperature Range	-55 to +150	° C	

Electrical Characteristics *($T_{Ambient}$=25ºC unless noted otherwise)*

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

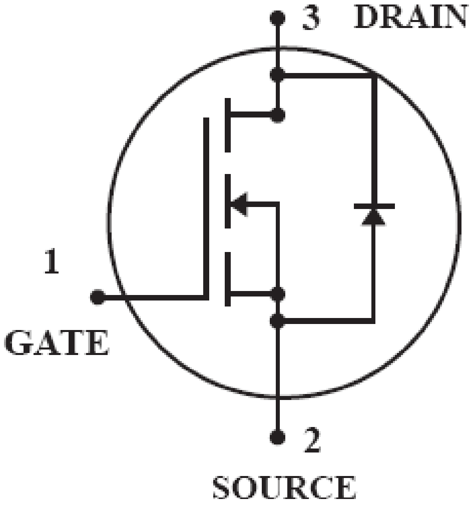
Dynamic Characteristics *($T_{Ambient}$=25ºC unless noted otherwise)*

Symbol	Description	Min.	Typ.	Max.	Unit	Conditions
C_{iss}	Input Capacitance	-	40	50	pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
C_{rss}	Reverse Transfer Capacitance	-	3.5	5.0		
C_{oss}	Output Capacitance	-	12	25		
t_{on}	Switching Time Turn-On Time	-	-	20	nS	V_{DD}=30V, I_D=200mA
t_{off}	Switching Time Turn-Off Time	-	-	20		

Note: (1) Pulse Test: Pulse Width≤300µs, Duty Cycle≤2%

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

Switching Time Test Circuit



Typical Characteristics Curves

Fig.1- On-Region Characteristics

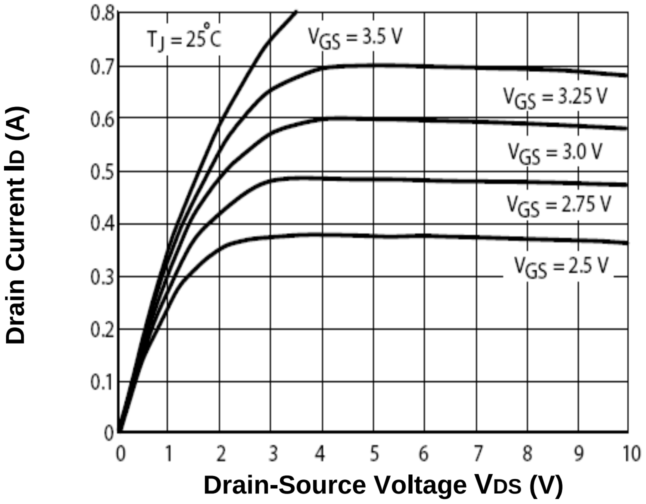


Fig.2- Transfer Characteristics

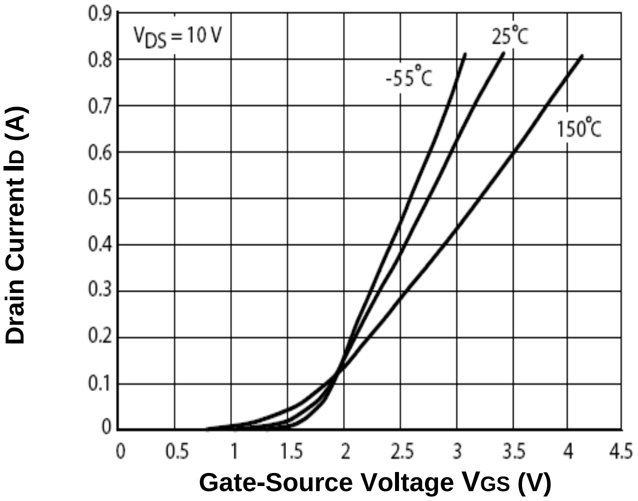


Fig.3- On-Resistance Variation with Temperature

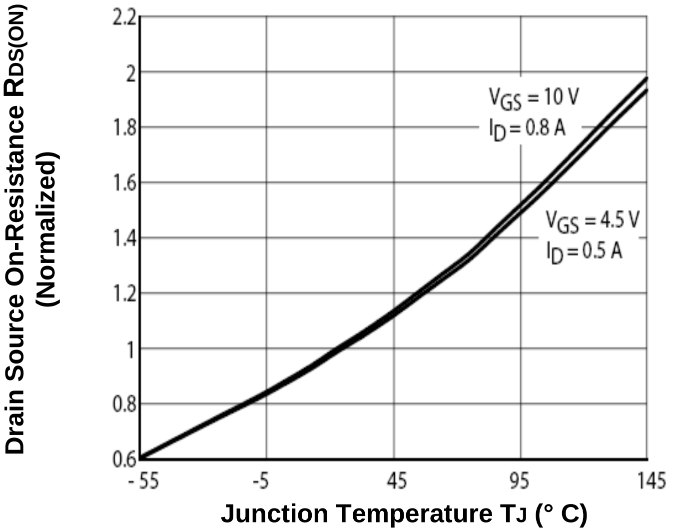


Fig.4- Threshold Voltage Variation with Temperature

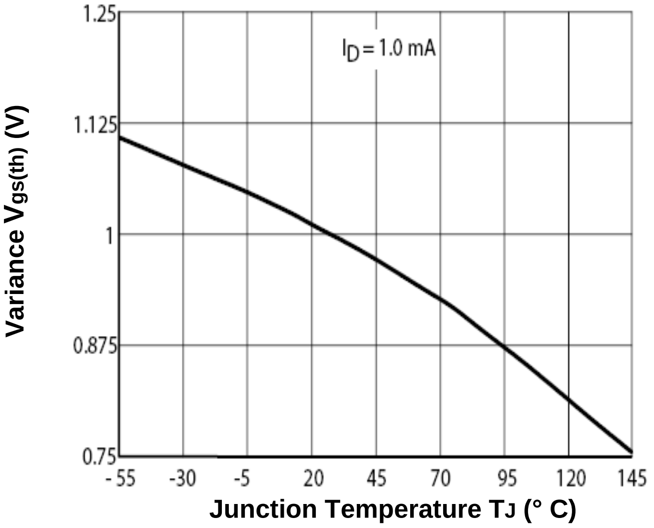


Fig.5- Gate Charge

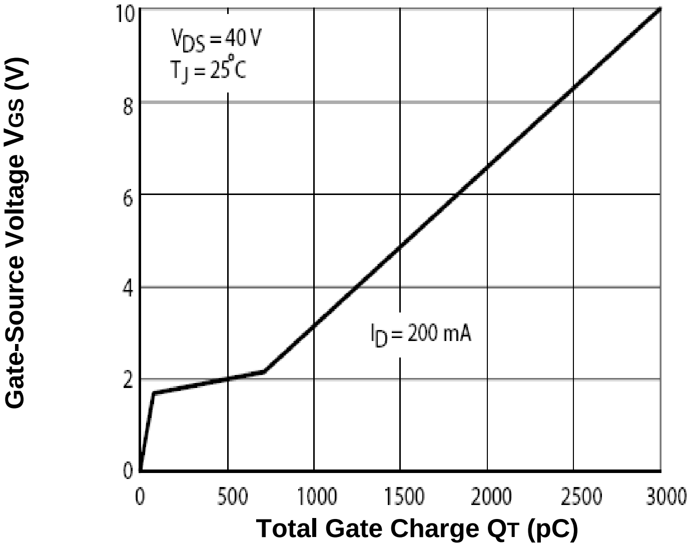


Fig.6- IDSS

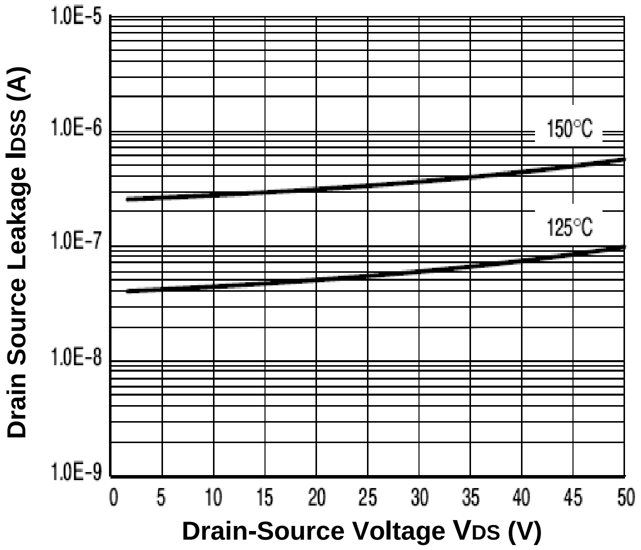


Fig.7- On-Resistance vs. Drain Current

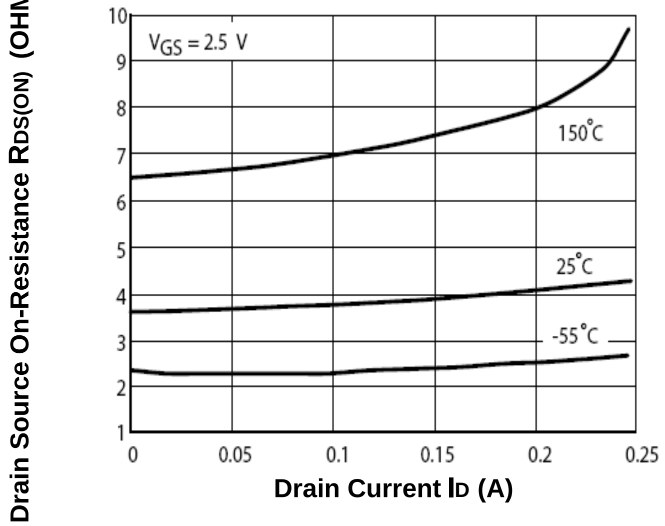


Fig.8- On-Resistance vs. Drain Current

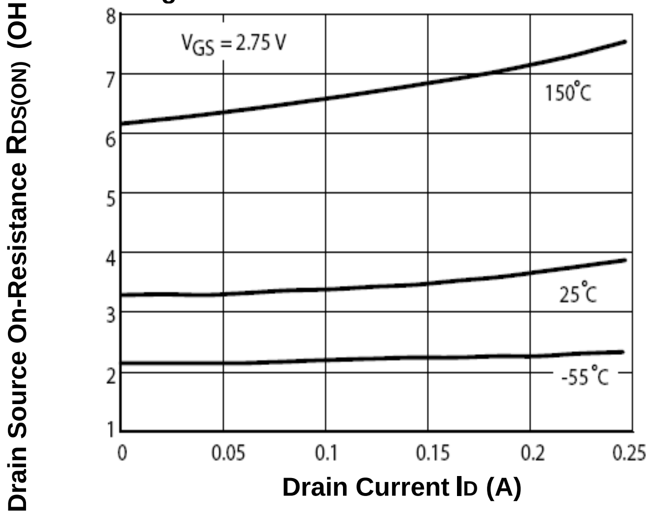


Fig.9- On-Resistance vs. Drain Current

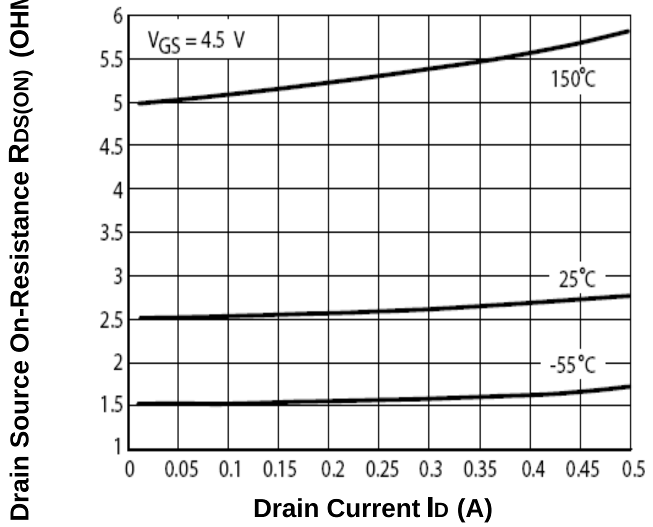


Fig.10- On-Resistance vs. Drain Current

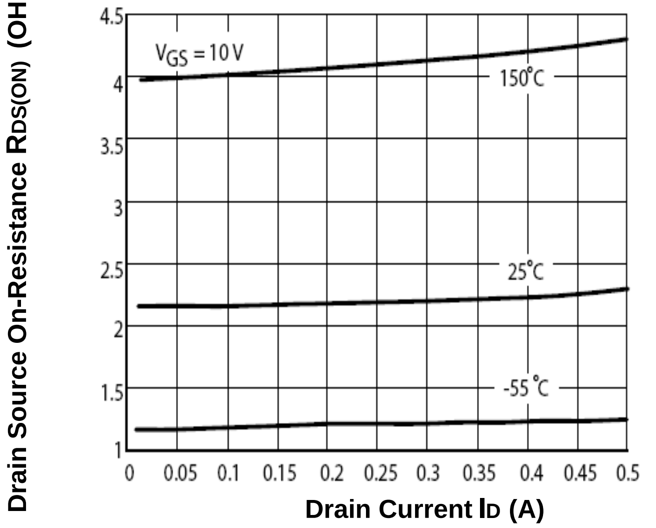


Fig.11- Body Diode Forward Voltage

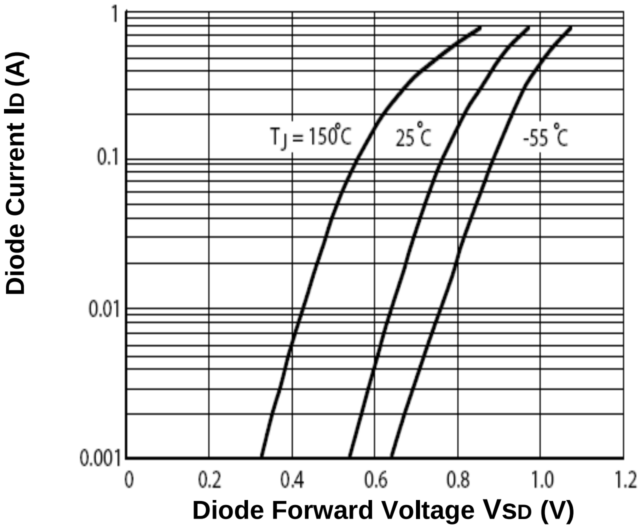
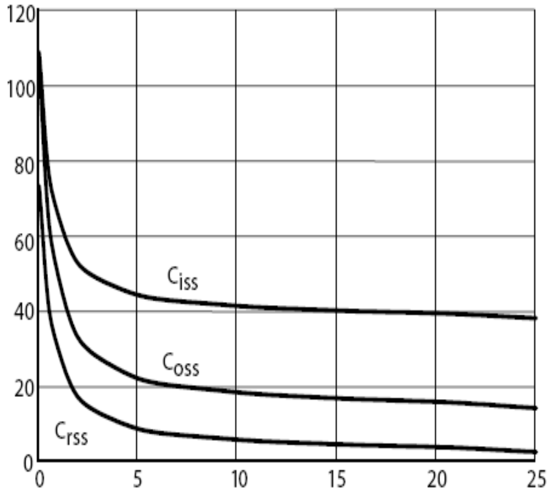
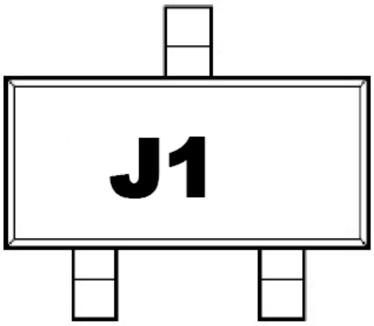


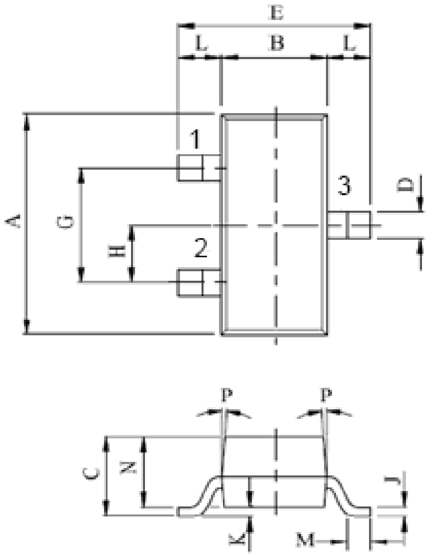
Fig.12- Capacitance



Marking Information:



Dimensions in mm



SOT-23

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°

1. Gate
2. Source
3. Drain

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