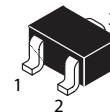
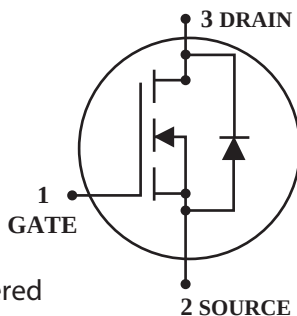


N-Channel POWER MOSFET

Pb Lead(Pb)-Free

Description:

* Typical applications are dc-dc converters, power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.



SOT-323(SC-70)

Features:

- * Simple Drive Requirement
- * Small Package Outline

Maximum Ratings (T_A=25°C Unless Otherwise Specified)

Rating	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	50	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current V _{GS} = (T _A =25°C)	I _D	200	mA
Pulsed Drain Current (tp ≤ 10μs)	I _{DM}	800	mA
Power Dissipation (T _A =25°C)	P _D	150	mW
Maximax Junction-to-Ambient	R _{θJA}	556	°C/W
Operating Junction Temperature Range	T _J	+150	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	T _L	260	°C

Device Marking

BSS138W = J1

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

Static

Drain-Source Breakdown Voltage $V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	$V_{(BR)DSS}$	50	-	-	V
Gate-Threshold Voltage $V_{DS}=V_{GS}$, $I_D=1.0\text{mA}$	$V_{GS(th)}$	0.5	-	1.5	V
Gate-Source Leakage Current $V_{GS}=\pm 20\text{V}$	I_{GSS}	-	-	± 0.1	μA
Drain-Source Leakage Current $V_{DS}=25\text{V}$, $V_{GS}=0$ $V_{DS}=50\text{V}$, $V_{GS}=0$	I_{DSS}	- -	- -	0.1 0.5	μA
Static Drain-Source On-Resistance $V_{GS}=2.75\text{V}$, $I_D < 200\text{mA}$, $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ $V_{GS}=5.0\text{V}$, $I_D=200\text{mA}$	$R_{DS(on)}$	- -	5.6 -	10 3.5	Ω
Forward Transconductance $V_{DS}=25\text{V}$, $I_D=200\text{mA}$, $f = 1.0\text{kHz}$	g_{fs}	100	-	-	mS

Dynamic

Input Capacitance $V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$	C_{iss}	-	40	50	pF
Output Capacitance $V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$	C_{oss}	-	12	25	
Reverse Transfer Capacitance $V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$	C_{rss}	-	3.5	5.0	

Switching²

Turn-On Time $V_{DD}=30\text{V}$, $I_D=200\text{mA}$	$t_{d(on)}$	-	-	20	ns
Turn-Off Time $V_{DD}=30\text{V}$, $I_D=200\text{mA}$	$t_{d(off)}$	-	-	20	

1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

2. Switching characteristics are independent of operating junction temperature.

Characteristics Curve

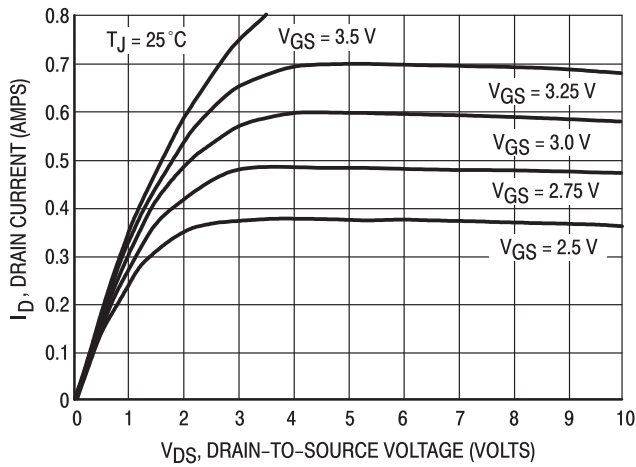


Fig.1 On-Region Characteristics

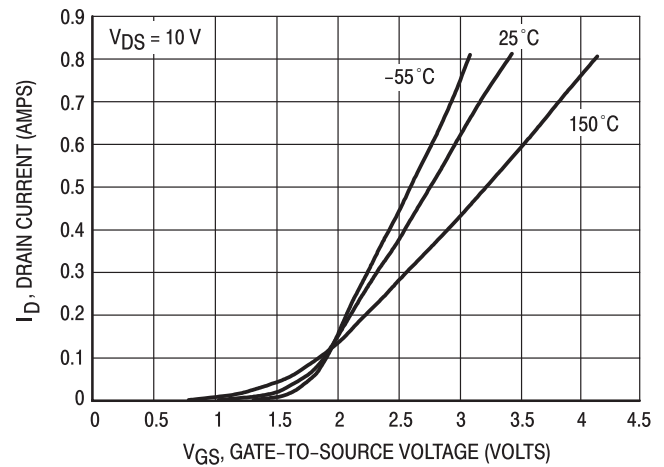


Fig.2 Transfer Characteristics

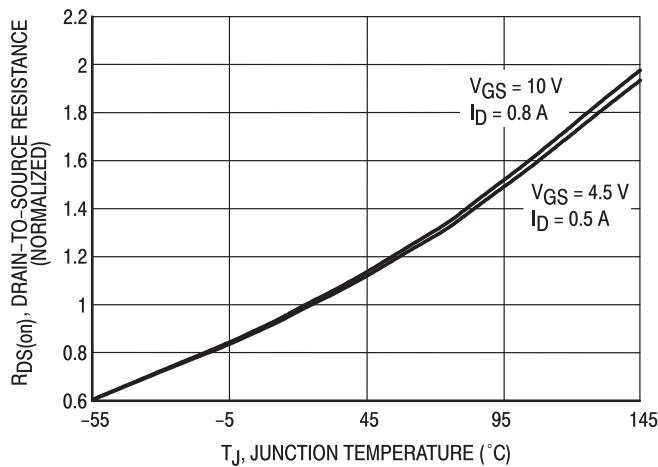


Fig.3 On-Resistance Variation with Temperature

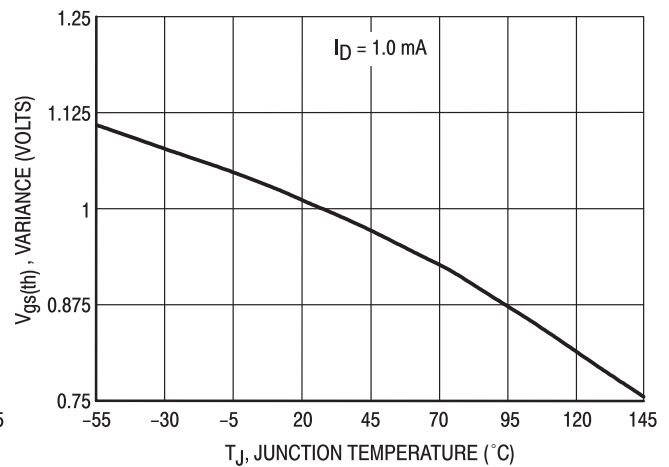


Fig.4 Threshold Voltage Variation with Temperature

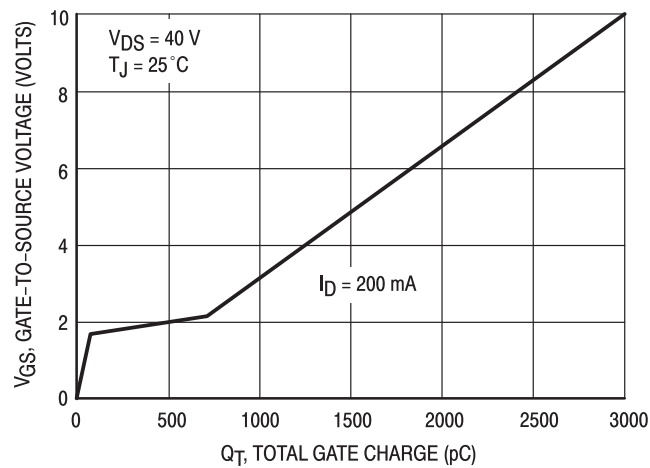


Fig.5 Gate Charge

Characteristics Curve

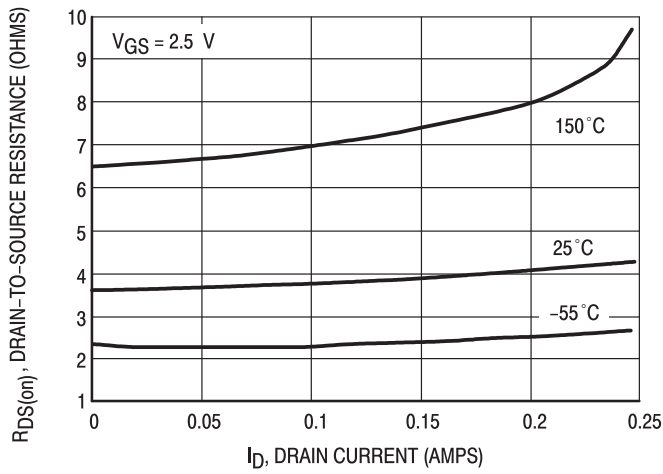


Fig.6 On-Resistance versus Drain Current

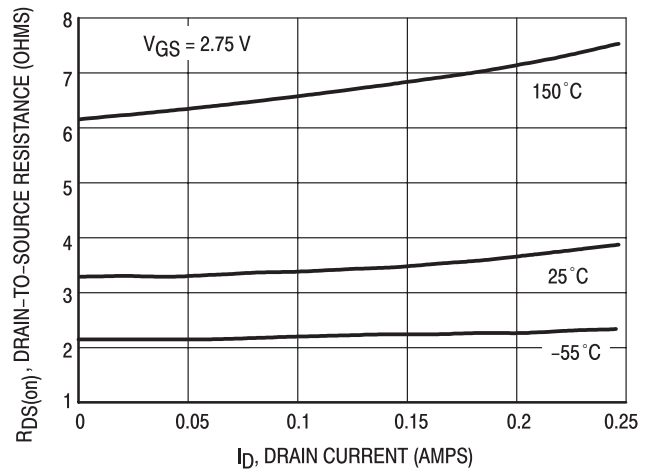


Fig.7 On-Resistance versus Drain Current

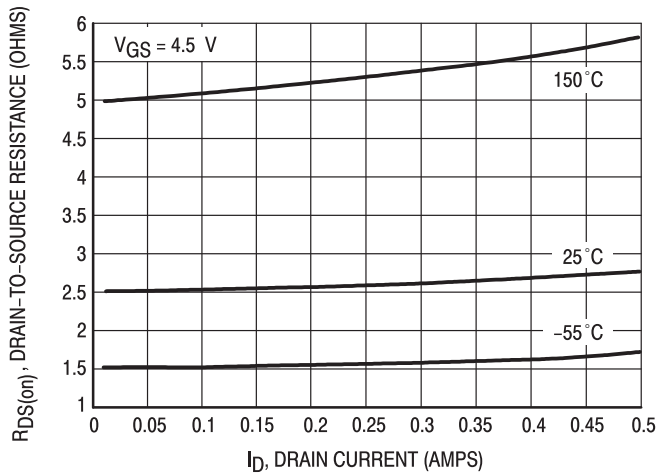


Fig.8 On-Resistance versus Drain Current

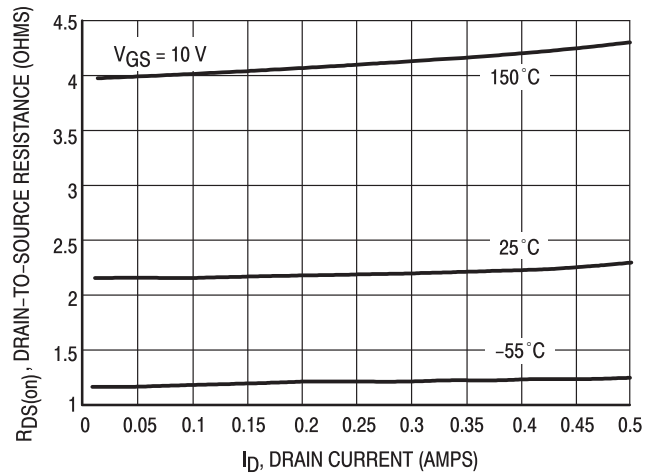


Fig.9 On-Resistance versus Drain Current

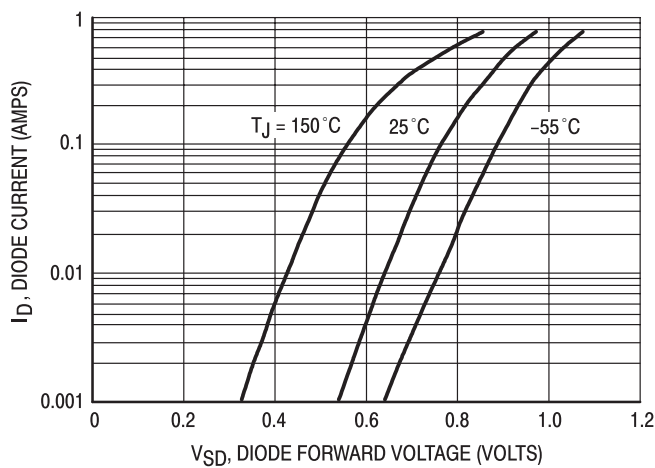


Fig.10 Body Diode Forward Voltage

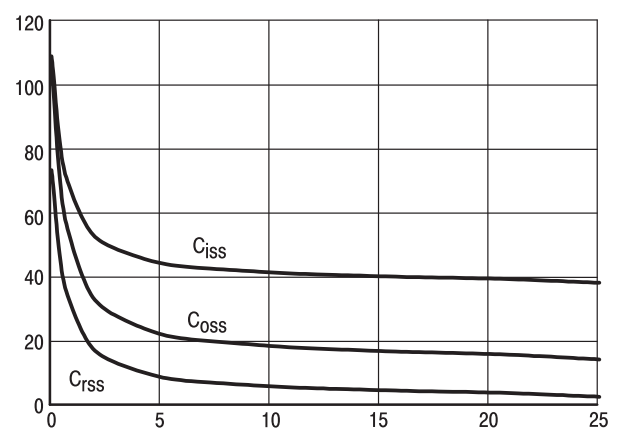
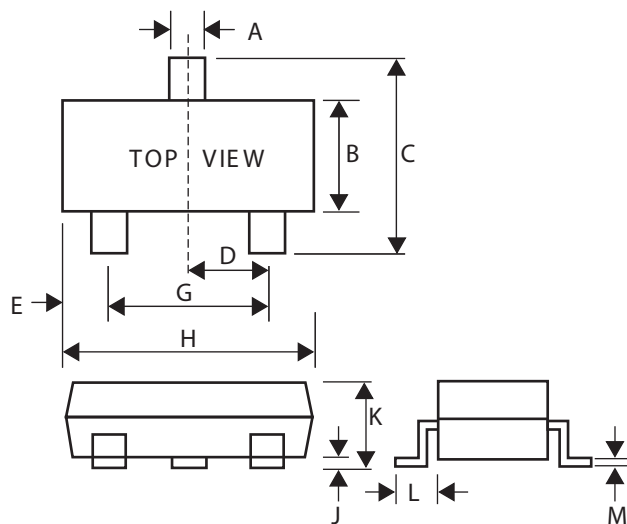


Fig.11 Capacitance

SOT-323 Outline Demensions

Unit:mm



SOT-323		
Dim	Min	Max
A	0.30	0.40
B	1.15	1.35
C	2.00	2.40
D	-	0.65
E	0.30	0.40
F	1.20	1.40
G	1.80	2.20
H	0.00	0.10
I	0.80	1.00
J	0.42	0.53
K	0.10	0.25