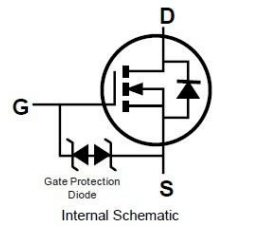
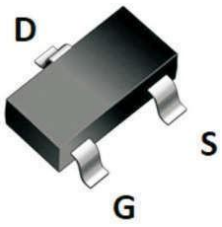
50V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	0.31A
V_{DS}	50V
R_{DSON}-typ(@V_{GS}=10V)	＜3.5Ω(Typ:2.5Ω)
R_{DSON}-typ(@V_{GS}=4.5V)	＜6.0Ω(Typ:4.2Ω)



Internal Schematic



SOT-23

FEATURES

- Low On-Resistance
- Low Input Capacitance.
- Fast Switching Speed.

MECHANICAL DATA

- Case: SOT-23
- Epoxy UL: 94V-0
- Mounting Position: Any

Marking Code	
BSS138K	38K

Maximum Ratings & Thermal Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameters	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	0.31	A
Maximum Continuous Body Diode Forward Current	Is	0.50	A
Pulsed Drain Current(10us Pulse, Duty Cycle=1%)	I_{DM}	0.80	A
Power Dissipation	P_D	350	mW
Junction Temperature	T_j	150	°C
Storage Temperature	Tstg	-50-+150	°C
Thermal Resistance From Junction to Ambient	$R_{\theta JA}$	357	°C/W

Electrical Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Test Condition	Symbols	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	$V_{(BR)DSS}$	50			V
Gate-Threshold voltage(note1)	V_{DS}=V_{GS}, I_D=1mA	$V_{GS\ (th)}$	0.5		1.5	V
Gate-body Leakage	V_{DS}=0V, V_{GS}=±20V	I_{GSS}			±10	μA
Zero Gate Voltage Drain current	V_{DS}=50V, V_{GS}=0V	I_{DSS}			1.0	μA
Drain-Source On-Resistance (note1)	V_{GS}=10V, I_D=0.22A	$R_{DS(ON)}$		2.5	3.5	Ω
	V_{GS}=4.5V, I_C=0.22A			4.2	6.0	
Forward trans conductance (note1)	V_{DS}=10V, I_D=0.22A	gfs	0.12			S
Diode forward voltage(note1)	I_S=0.22A, V_{GS}=0V	V_{SD}			1.2	V
Input capacitance	V_{DS}=25V V_{GS}=0V f=1MHz	C_{iss}		27		pF
Output capacitance		C_{oss}		13		
Reverse Transfer capacitance		C_{rss}		6		
Turn-on Time	V_{DD}=30V R_{GEN}=6Ω V_{DS}=10V I_D≈0.29A	$t_{d(on)}$			5	ns
Rise time		t_r			18	
Turn-off Time		$t_{d(off)}$			36	
Fall time		t_f			14	
Reverse Recovery Time		tRR		8.8		ns
Reverse Recovery Charge		QRR		2.6		nC
Total Gate Charge(V_{GS}=4.5V)	V_{DS}=25V I_D=0.2A	Q_g		0.45		nC
Total Gate Charge(V_{GS}=10V)		Q_g		0.95		
Gate-Source Charge		Q_{gs}		0.10		
Gate-Drain Charge		Q_{gd}		0.14		
Gate Resistance		Rg		69		Ω

Notes:

1. Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%.

2. These parameters have no way to verify.

Typical characteristics

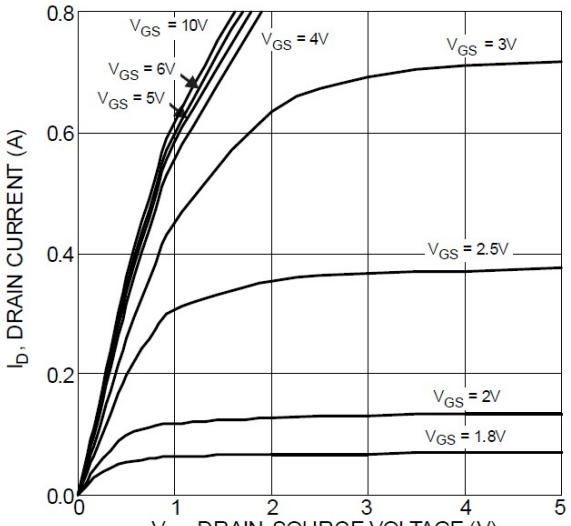


Figure 1 Typical Output Characteristic

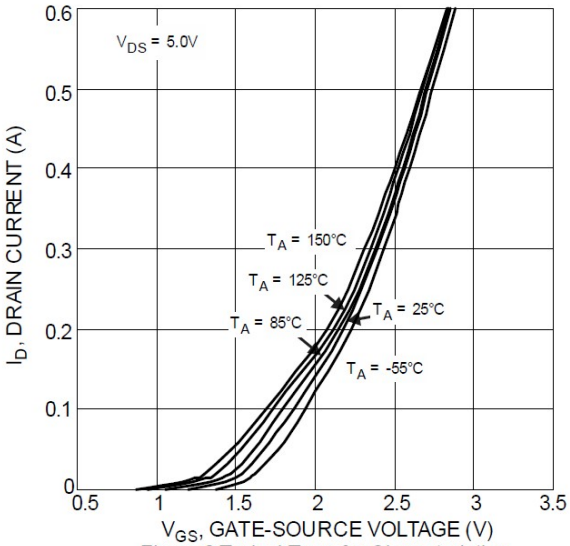


Figure 2 Typical Transfer Characteristics

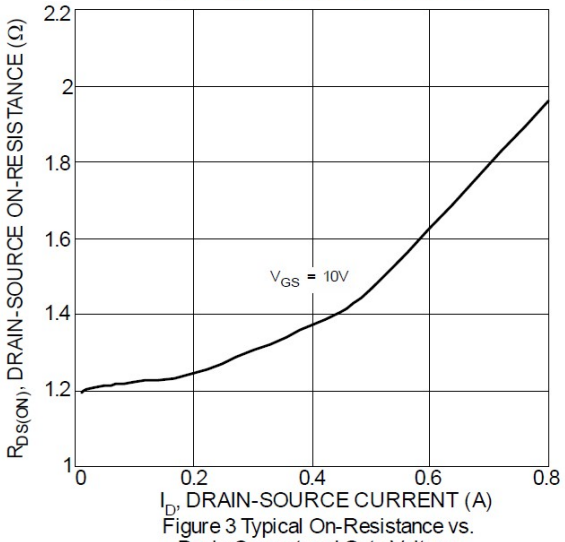


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

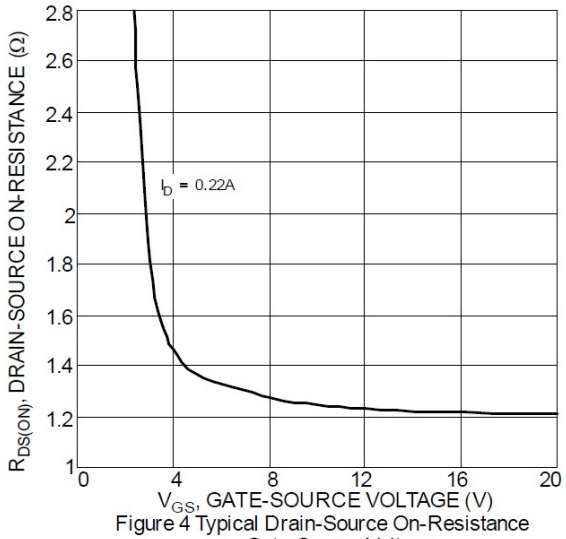


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

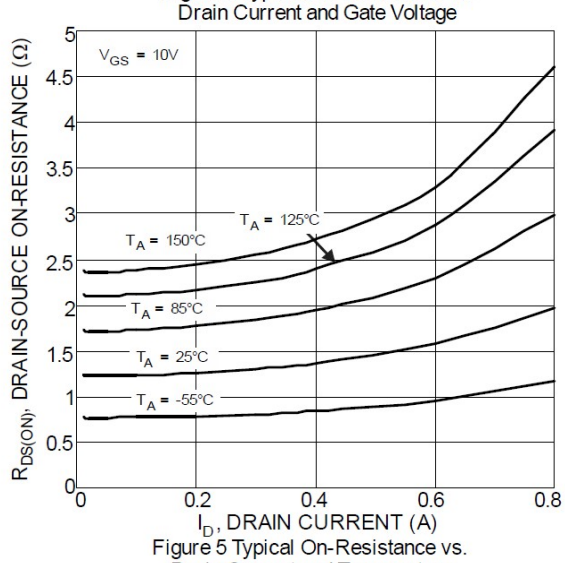


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

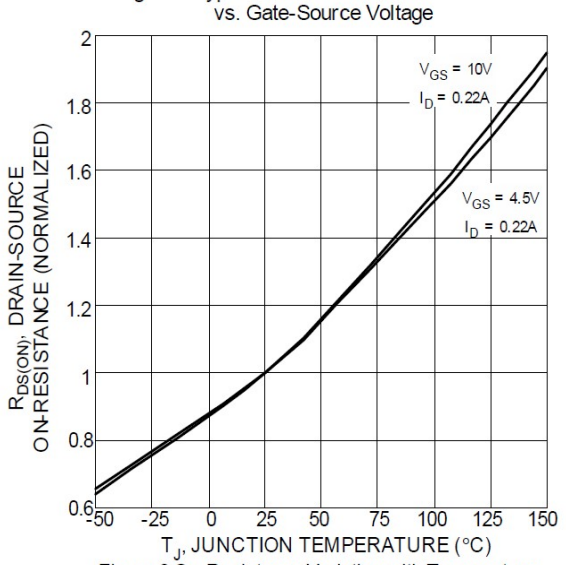


Figure 6 On-Resistance Variation with Temperature

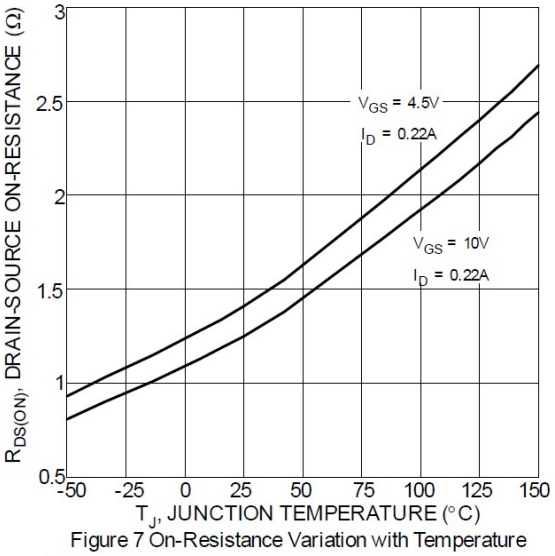


Figure 7 On-Resistance Variation with Temperature

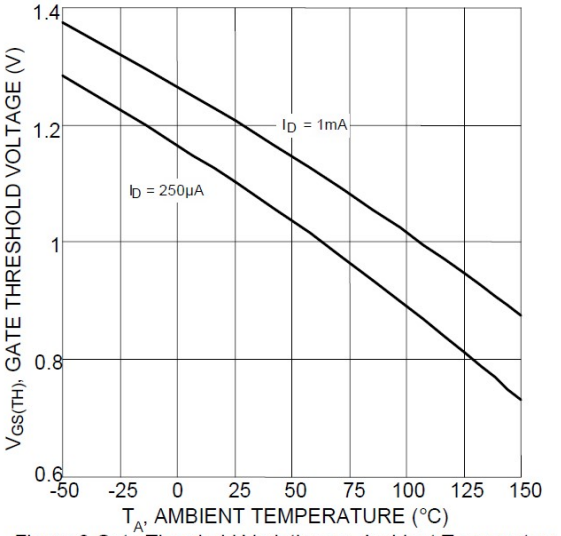


Figure 8 Gate Threshold Variation vs. Ambient Temperature

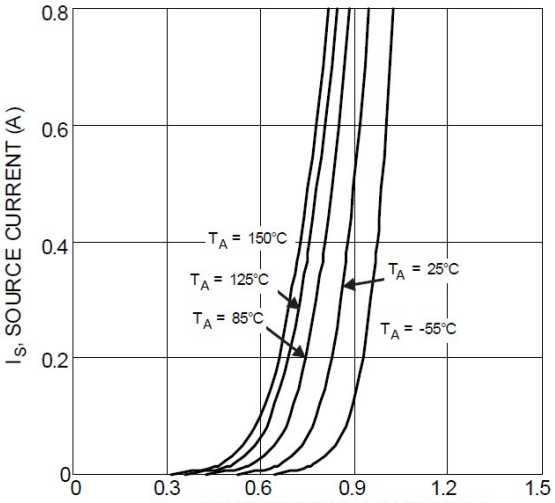


Figure 9 Diode Forward Voltage vs. Current

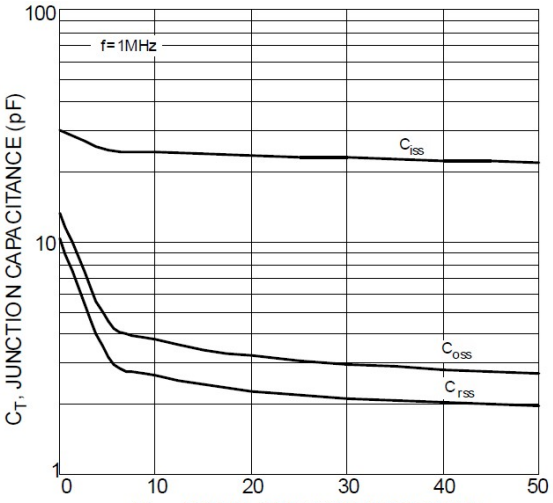


Figure 10 Typical Junction Capacitance

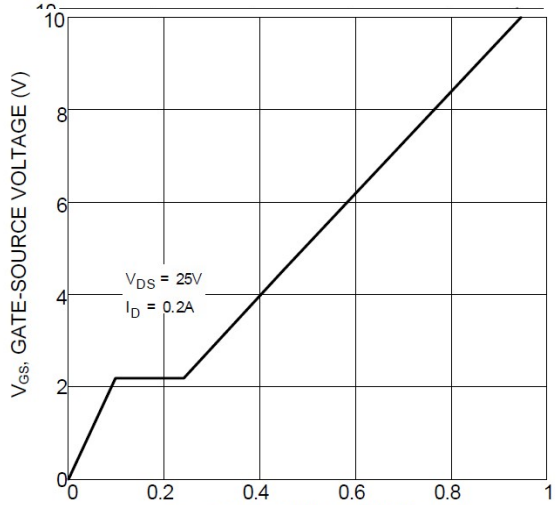


Figure 11 Gate Charge

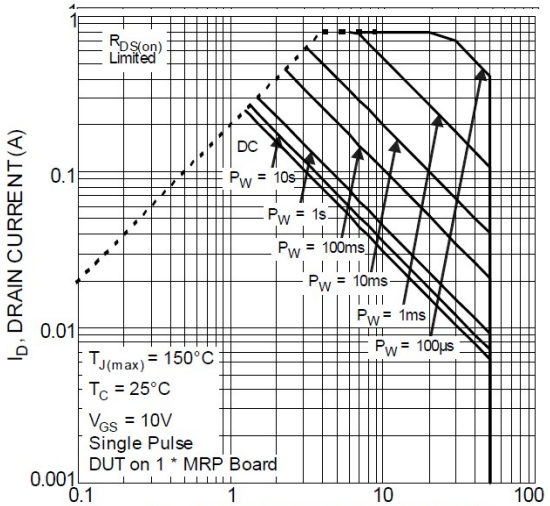


Figure 12 SOA, Safe Operation Area

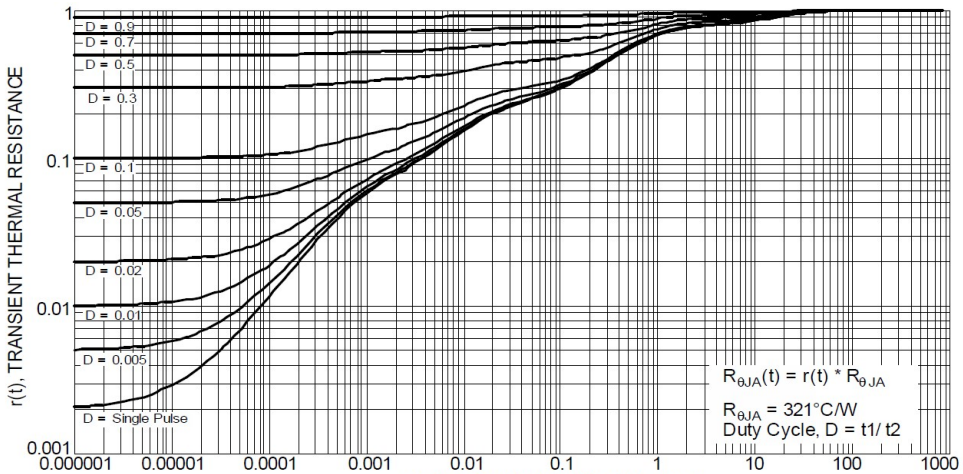


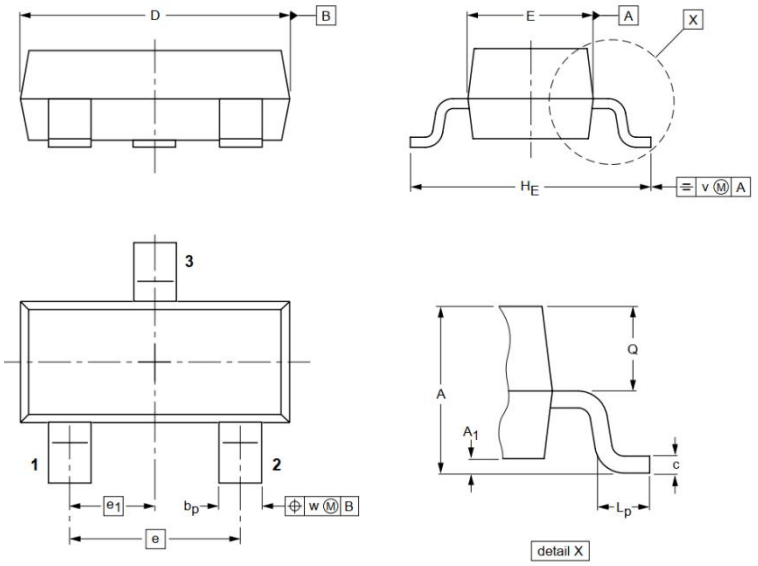
Figure 13 Transient Thermal Resistance

Ordering information

Package	Packing Description	Base Quantity	Packing Quantity
SOT-23	Tape/Reel,7"reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

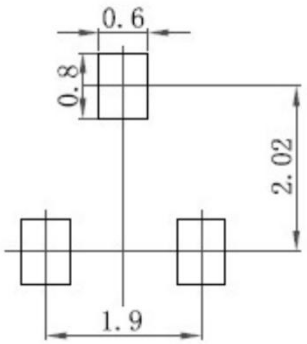
Package Dimensions

SOT-23



Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.15	35	45
A1	0.1		3.9	
bp	0.38	0.48	15	19
C	0.09	0.15	3.54	5.9
D	2.8	3.0	110	118
E	1.2	1.4	47	55
e	1.9		75	
e1	0.95		37	
HE	2.1	2.55	83	100
Lp	0.15	0.45	5.9	18
Q	0.45	0.55	18	22
v	0.2		7.9	
W	0.1		4	

The recommended mounting pad size



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