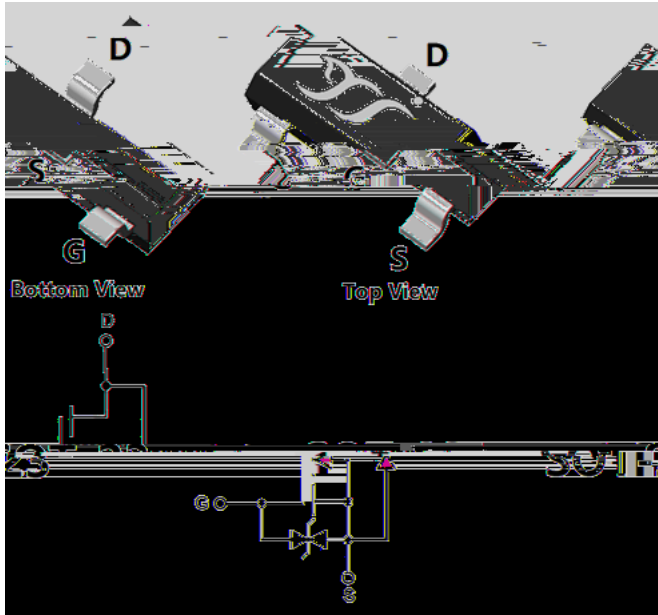




N-Channel Enhancement Mode Field Effect Transistor



Product Summary

V_{DS}	50V
I_D	0.22A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	1.6
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	2.5
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	3.8
Gate-Source ESD Rating Up to 1.5KV (HBM)	

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Power Management Functions
- Load switch
- DC-DC convertor

Absolute Maximum Ratings ($T_J=25$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	50	V
Gate-source Voltage	V_{GS}	± 20	V

Co □

	$c=25$, $t_p=100\mu s$	I_{DM}	1	A
Total Power Dissipation (Note 1,2)	Steady-State	$T_A=25$		

		J_A	-	202	/W
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Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
BSS138AJKQ	F2	.SS	3000	30000	120000	7" reel



BSS138AJKQ

Electrical Characteristics (T_J=25 unless otherwise noted)

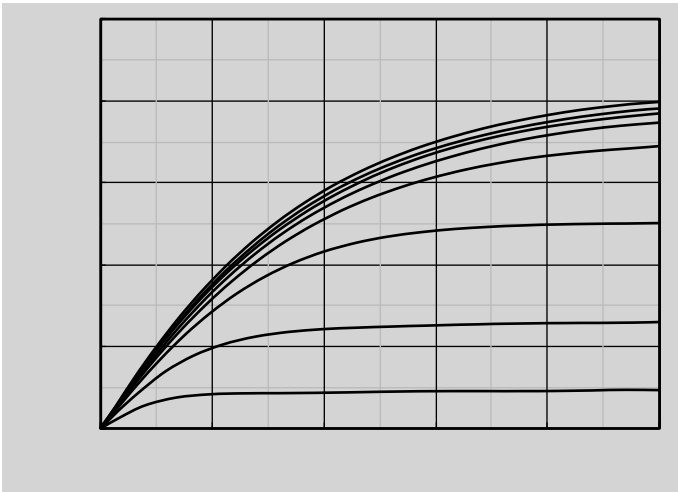
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	50	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =50V, V _{GS} =0V	-	-	1	μA
		V _{DS} =50V, V _{GS} =0V, T _J =150	-	-	100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	-	-	±5	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.7	1	1.45	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =0.5A	-	1.2	1.6	
		V _{GS} =4.5V, I _D =0.1A	-	1.24	2.5	
		V _{GS} =2.5V, I _D =0.1A	-	1.8	3.8	
Diode Forward Voltage	V _{SD}	I _S =0.22A, V _{GS} =0V	-	-	1.2	V
Gate resistance	R _G	f=1MHz	-	75	-	
Maximum Body-Diode Continuous Current	I _S		-	-	0.22	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	29	-	pF
Output Capacitance	C _{oss}		-	4.3	-	
Reverse Transfer Capacitance	C _{riss}		-	3	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =25V, I _D =0.5A	-	1.2	-	nC
Gate-Source Charge	Q _{gs}		-	0.15	-	
Gate-Drain Charge	Q _{gd}		-	0.31	-	
Reverse Recovery Charge	Q _{rr}	I _F =0.5A, di/dt=100A/us	-	2.1	-	nC
Reverse Recovery Time	t _{rr}		-	9.2	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =25V, I _D =0.5A R _{GEN} =25	-	3	-	ns
Turn-on Rise Time	t _r		-	2.7	-	
Turn-off Delay Time	t _{D(off)}		-	11	-	
Turn-off fall Time	t _f		-	8.1	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of R_{JA} is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with TA =25 . The maximum allowed junction temperature of 150 . The value in any given application depends on the user's specific board design.



Typical Electrical and Thermal Characteristics Diagrams





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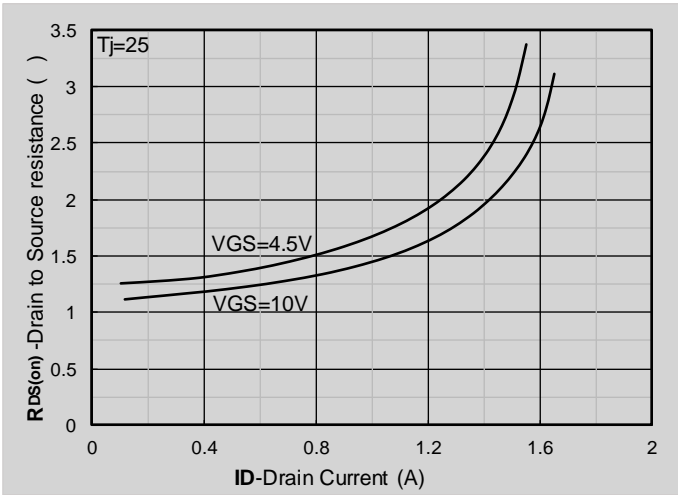


Figure 7. $R_{DS(on)}$ VS Drain Current

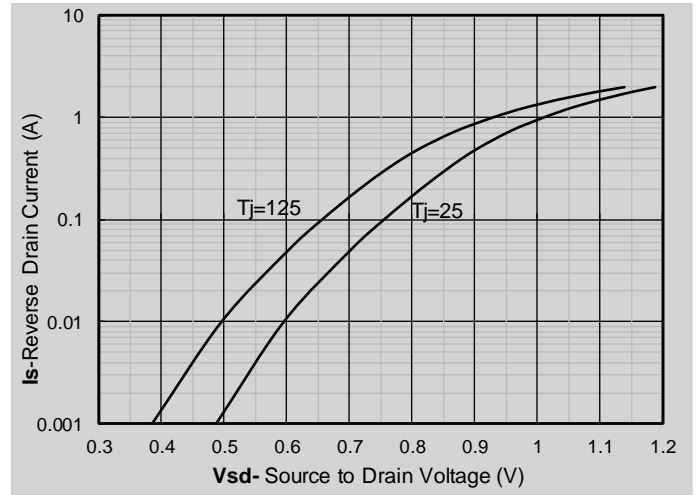
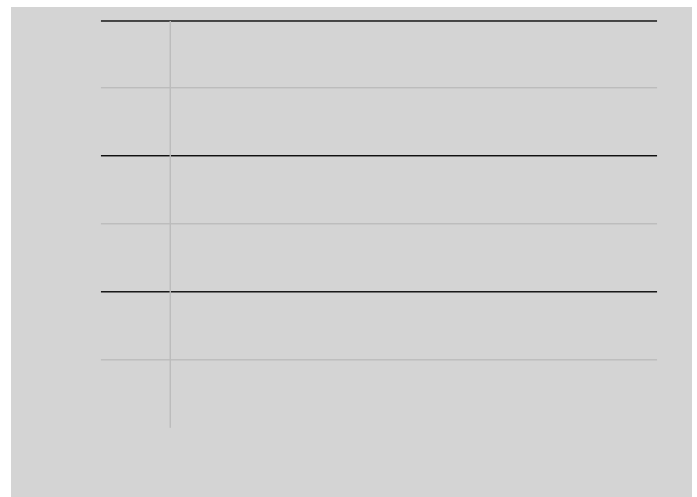
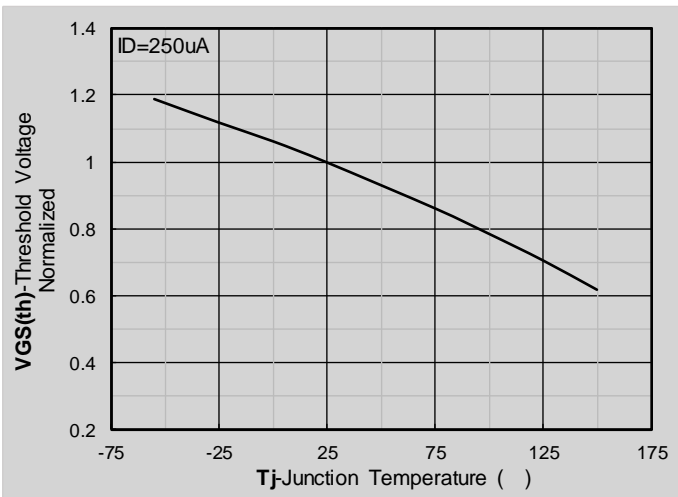


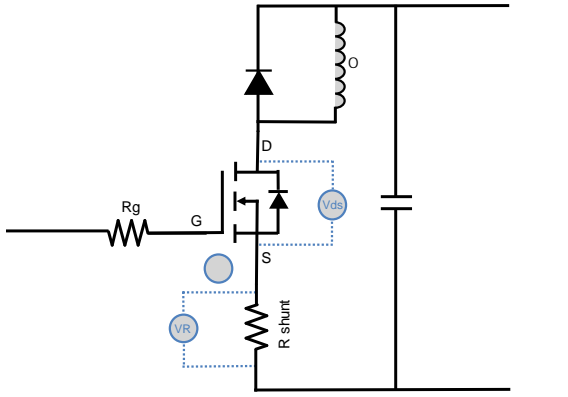
Figure 8. Forward characteristics of reverse diode



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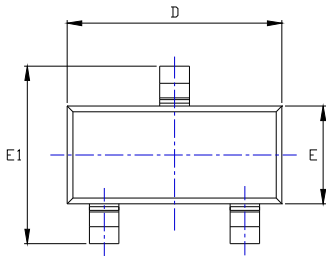
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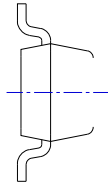


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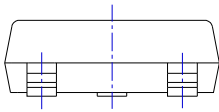
SOT-23 Package information



TOP VIEW



SIDE VIEW



UNIT mm

SUGGESTED SOLDER PAD LAYOUT



BSS138AJKQ

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