

### Description

The BSS84AK-JSM uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

### General Features

$V_{DS} = -50V, I_D = -0.13A$

$R_{DS(ON)} < 5 \Omega @ V_{GS} = -10V$

$R_{DS(ON)} < 6 \Omega @ V_{GS} = -4.5V$

### Application

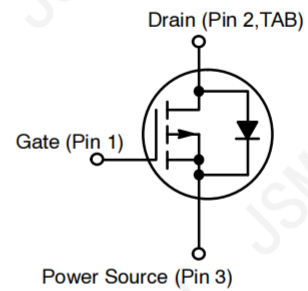
Power switching application

Hard switched and high frequency circuits

DC-DC converter



SOT-23



### Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-50	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-0.13	A
Pulsed Drain Current	$I_{DM}$	-0.5	A
Maximum Power Dissipation	$P_D$	0.35	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$

**Electrical Characteristics (Ta=25°C unless otherwise specified)**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
<b>Static</b>						
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS}=0, I_D=250\mu A$	-50			V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.8		-2.0	V
$I_{GSS}$	Gate-body leakage current	$V_{DS}=0, V_{GS}=\pm 10V$			$\pm 10$	$\mu A$
$I_{DSS}$	Zero gate voltage drain current	$V_{DS}=-50V, V_{GS}=0V$			-10	$\mu A$
		$V_{DS}=-40V, V_{GS}=0V$			-100	nA
$R_{DS(on)}$	Drain-source on-resistance <sup>a</sup>	$V_{GS}=-10V, I_D=-0.13A$		2	5	$\Omega$
		$V_{GS}=-4.5V, I_D=-0.13A$		2.5	6	$\Omega$
$g_{FS}$	Forward transconductance <sup>a</sup>	$V_{DS}=-25V, I_D=-0.13A$	50			mS
$V_{SD}$	Diode forward voltage	$I_S=-0.13A, V_{GS}=0V$			-1.0	V
<b>Dynamic</b>						
$C_{iss}$	Input capacitance	$V_{DS}=-25V, V_{GS}=0V, f=1MHz$		25		pF
$C_{oss}$	Output capacitance			15		
$C_{rss}$	Reverse transfer capacitance <sup>b</sup>			3.5		
<b>Switching<sup>b</sup></b>						
$t_{d(on)}$	Turn-on delay time	$V_{GS}=-10V, V_{DS}=-15V$ $I_D=-200mA, R_{GEN}=25\Omega$		16.7		nS
$t_r$	Rise time			8.6		
$t_{d(off)}$	Turn-off delay time			17.9		
$t_f$	Fall time			5.3		

Notes :

 a. Pulse Test : Pulse width $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

b. Guaranteed by design, not subject to producing.

**Typical Characteristics**

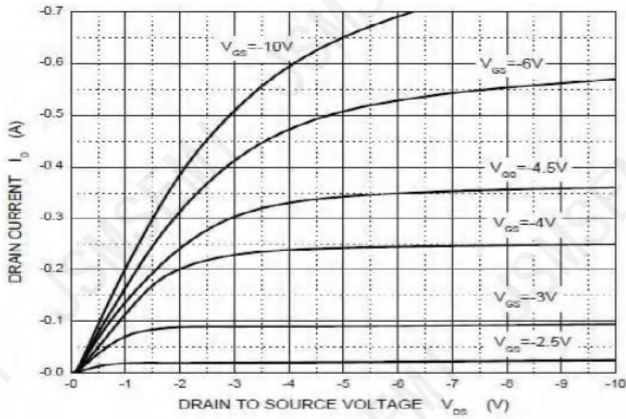


Figure1. Output Characteristics

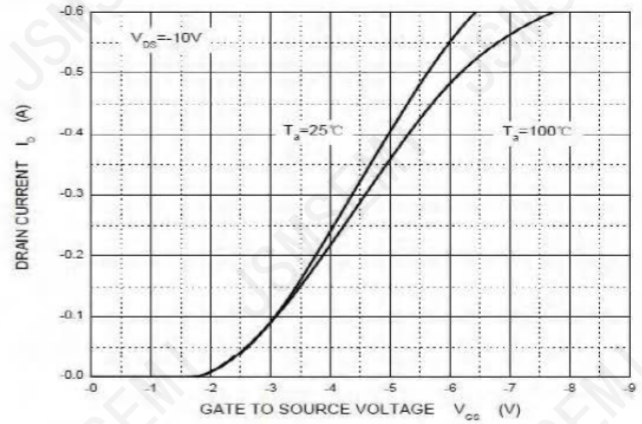


Figure2. Transfer Characteristics

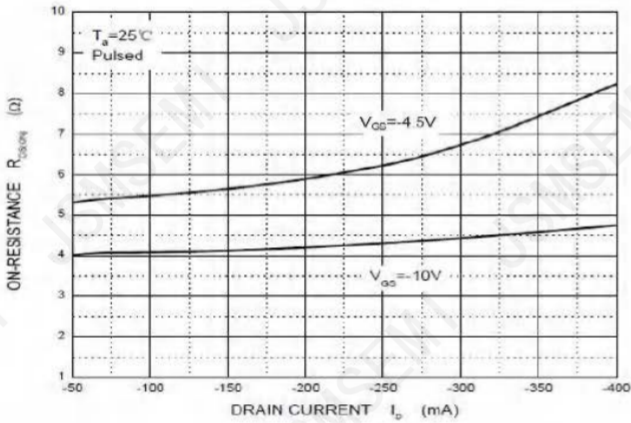


Figure3. Drain-Source on Resistance

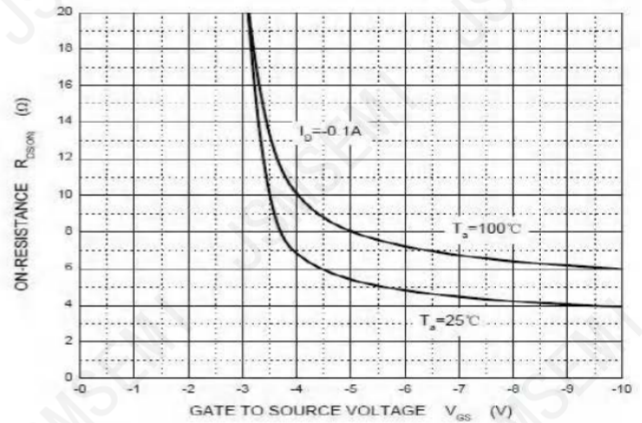


Figure4. Drain-Source on Resistance

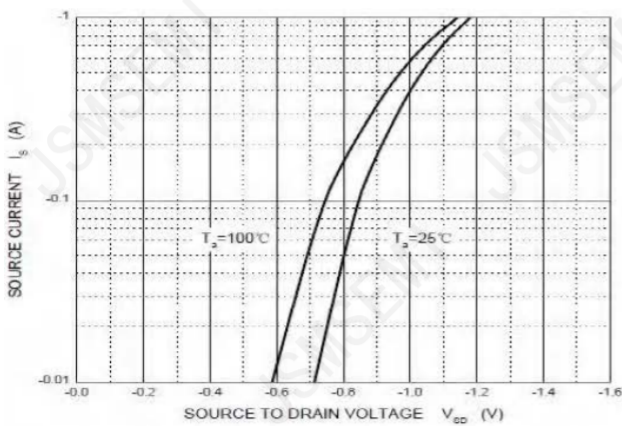


Figure5. Diode Forward Voltage vs. current

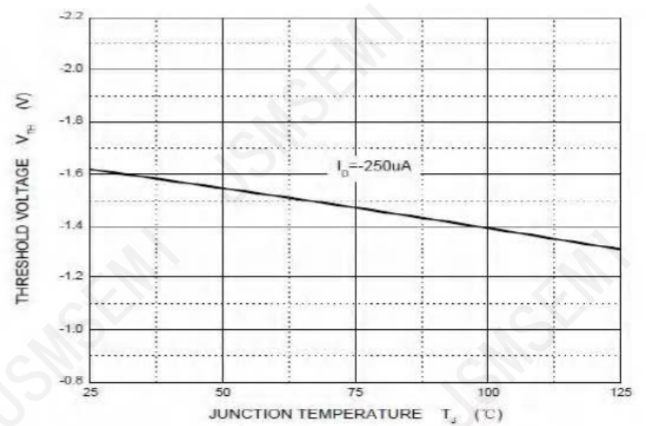
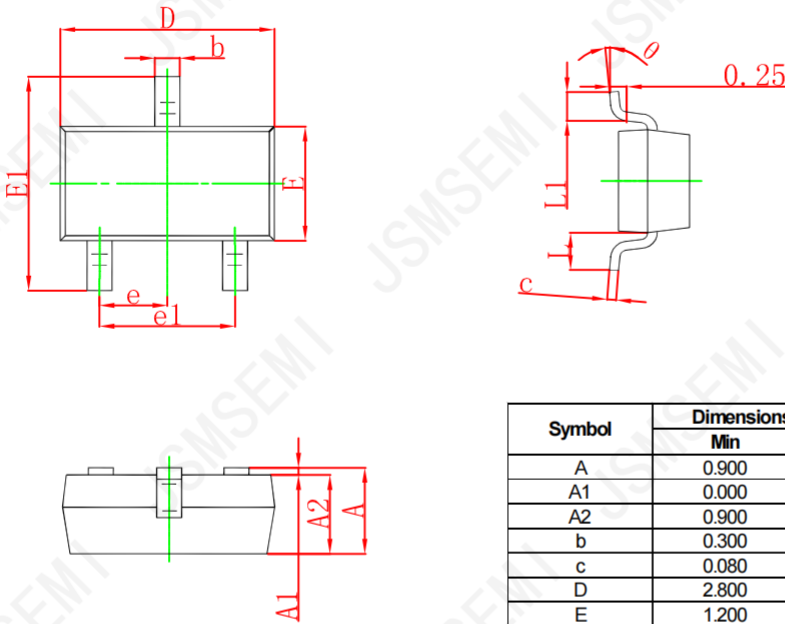
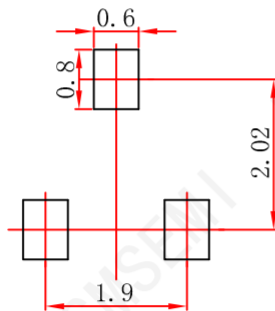


Figure6. Gate Threshold vs. Junction Temperature

**SOT-23 Package Outline Dimensions**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

**SOT-23 Suggested Pad Layout**

**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

## Revision History

Rev.	Change	Date
V1.0	Initial version	2/23/2024

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