



## 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.

The BSS139D is available in SC-88 package

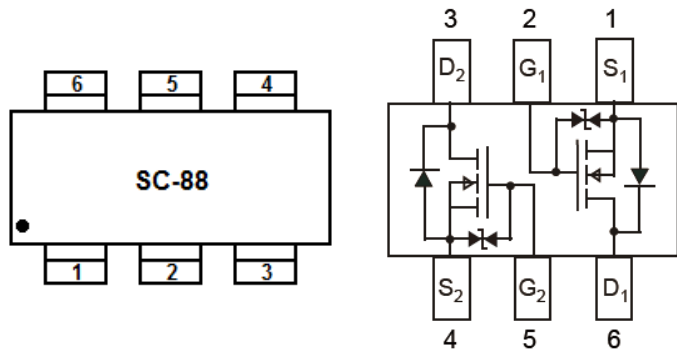
## FEATURES

- Low Threshold Voltage ( $V_{GS(th)}$ : 0.5V...1.5V) makes it ideal for low voltage applications
- ESD Protected:1500V
- Available in SC-88 package

## ORDERING INFORMATION

Package Type	Part Number
SC-88	BSS139D
Note	SPQ: 3,000pcs/Reel
AiT provides all RoHS Compliant Products	

## PIN DESCRIPTION



## ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$ , unless otherwise noted

$V_{DSS}$ , Drain–to–Source Voltage	50Vdc
$V_{GS}$ , Gate–to–Source Voltage – Continuous	$\pm 20\text{Vdc}$
Drain Current	
$I_D$ , -Continuous @ $T_A = 25^\circ\text{C}$	200mA
$I_{DM}$ , -Pulsed Drain Current ( $t_p \leq 10\mu\text{s}$ )	800mA
$P_D$ , Total Power Dissipation @ $T_A = 25^\circ\text{C}$	380mW
$T_J$ , $T_{STG}$ , Operating and Storage Temperature Range	$-55^\circ\text{C} \sim 150^\circ\text{C}$
$R_{\theta JA}$ , Thermal Resistance – Junction–to–Ambient	328°C/W
$T_L$ , Maximum Lead Temperature for Soldering Purposes, for 10 seconds	260°C

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0Vdc, I <sub>D</sub> =250μAdc	50	-	-	Vdc
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =25Vdc, V <sub>GS</sub> =0Vdc	-	-	0.1	μAdc
		V <sub>DS</sub> =50Vdc, V <sub>GS</sub> =0Vdc	-	-	0.5	
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20Vdc, V <sub>DS</sub> =0Vdc	-	-	±10	μAdc
<b>ON CHARACTERISTICS</b> NOTE1						
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1.0mAdc	0.5	-	1.5	Vdc
Static Drain-to-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =2.75Vdc, I <sub>D</sub> <200mAdc, T <sub>A</sub> =-40°C to +85°C	-	5.6	10	Ohms
		V <sub>GS</sub> =5.0Vdc, I <sub>D</sub> =200mAdc	-	-	3.5	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =25Vdc, I <sub>D</sub> =200mAdc, f=1.0kHz	100	-	-	mmhos
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25Vdc, V <sub>GS</sub> =0, f=1MHz	-	22.8	-	pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =25Vdc, V <sub>GS</sub> =0, f=1MHz	-	3.5	-	
Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =25Vdc, V <sub>GS</sub> =0, f=1MHz	-	2.9	-	
<b>SWITCHING CHARACTERISTICS</b> NOTE2						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 30Vdc, I <sub>D</sub> = 0.5Adc	-	3.8	-	ns
Turn-Off Delay Time	t <sub>d(off)</sub>		-	19	-	ns

NOTE1: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%.

NOTE2: Switching characteristics are independent of operating junction temperature.



### TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

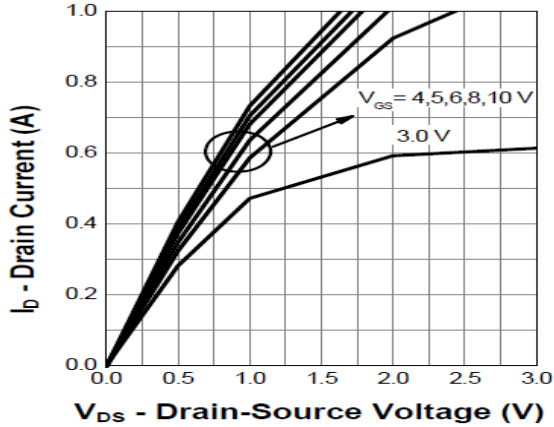


Figure 2. Drain-Source On Resistance

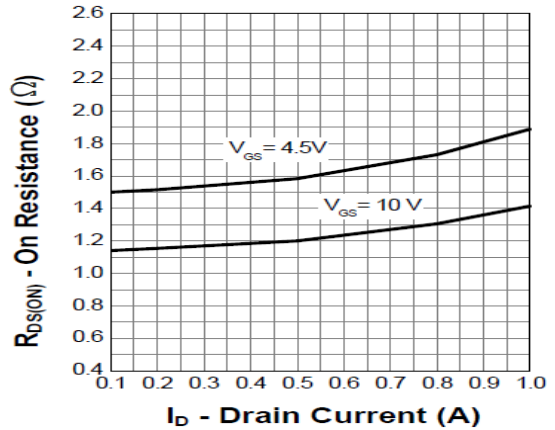


Figure 3. Transfer Characteristics

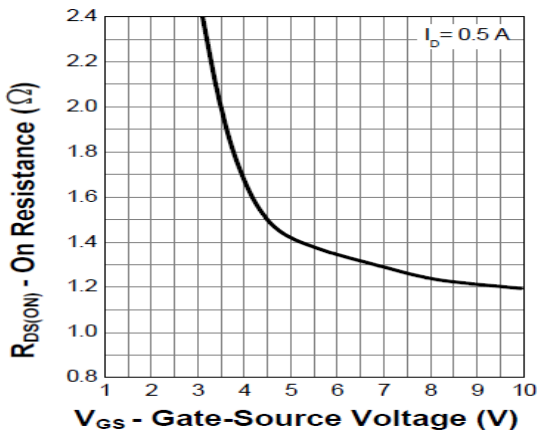


Figure 4. Gate Threshold Voltage

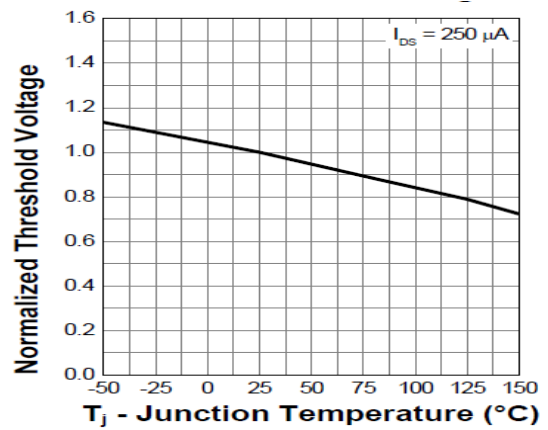


Figure 5. Drain-Source On Resistance

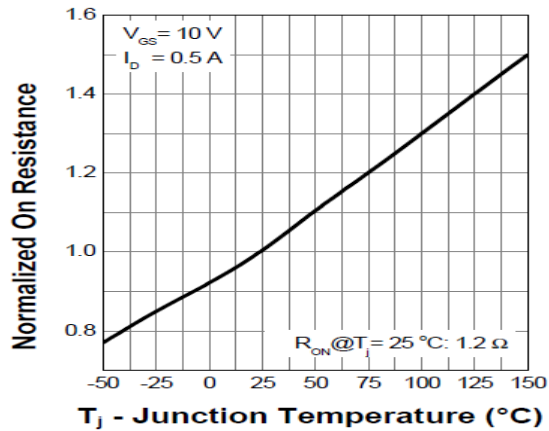


Figure 6. Source-Drain Diode Forward

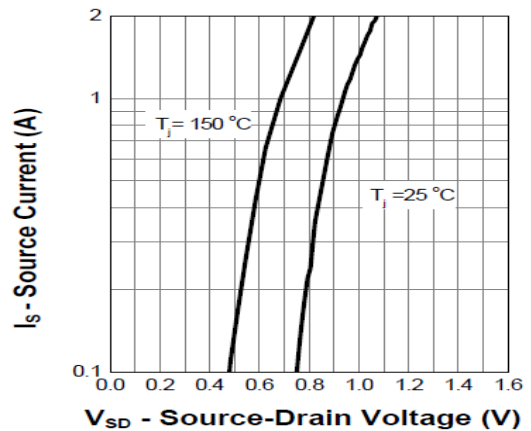




Figure 7. Capacitance

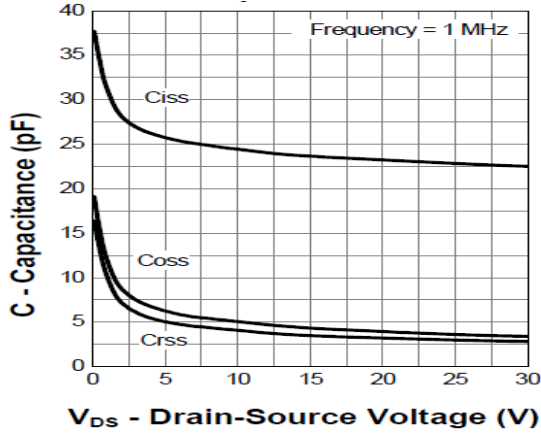


Figure 8. Gate Charge

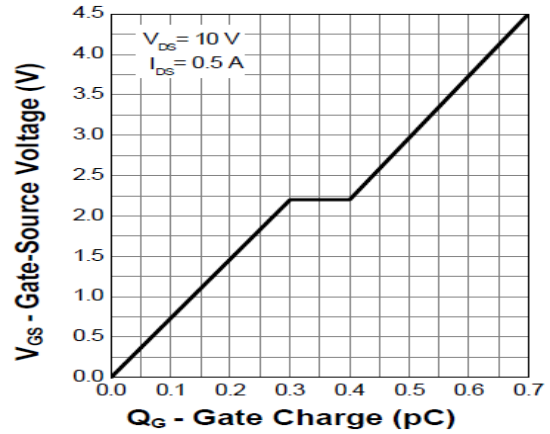


Figure 9. Drain-Source On Resistance

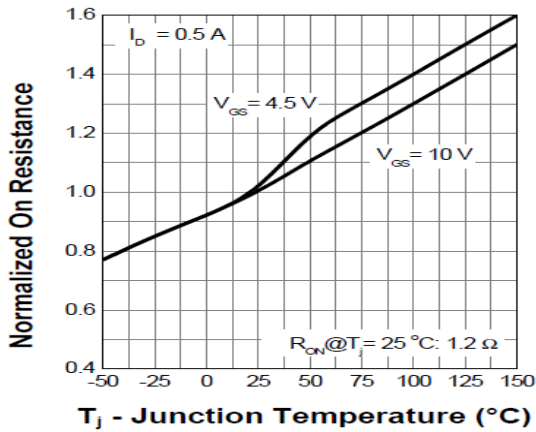


Figure 10. Drain-Source On Resistance

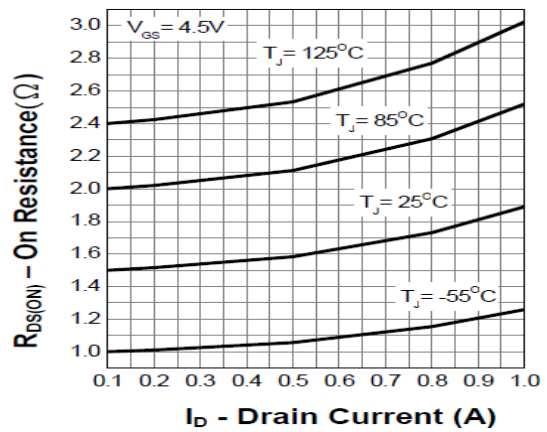


Figure 11. Drain-Source On Resistance

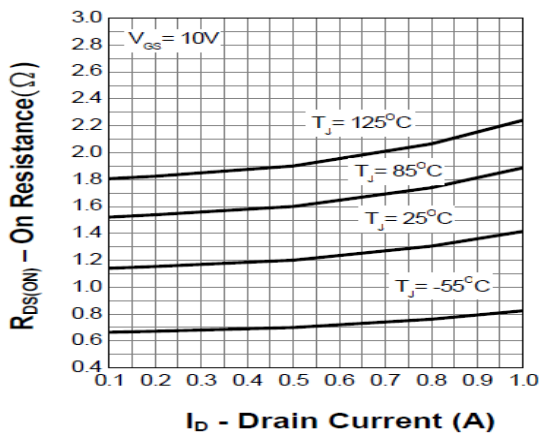
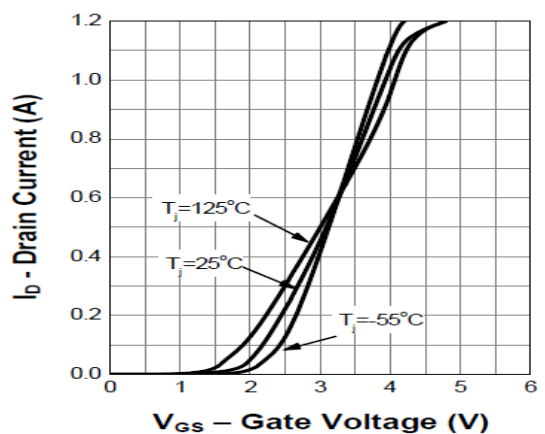


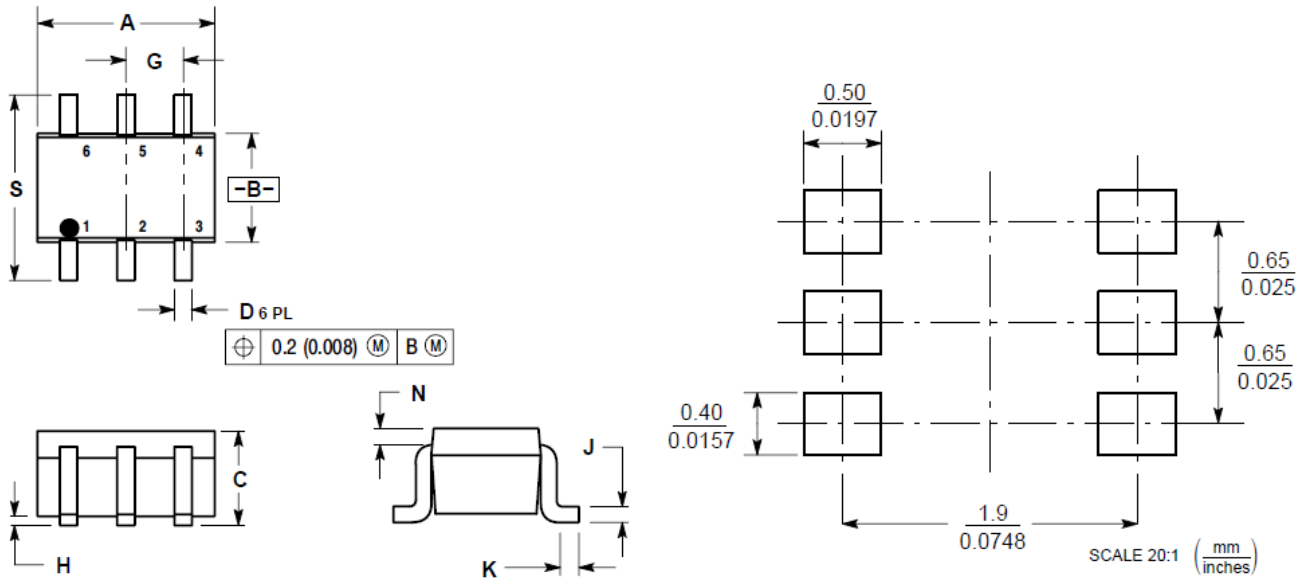
Figure 12. Transfer Characteristics





**PACKAGE INFORMATION**

Dimension in SC-88 Package (Unit: mm)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.80	2.20	0.071	0.087
B	1.15	1.35	0.045	0.053
C	0.80	1.10	0.031	0.043
D	0.10	0.30	0.004	0.012
G	0.65 BSC		0.026 BSC	
H	-	0.10	-	0.004
J	0.10	0.25	0.004	0.010
K	0.10	0.30	0.004	0.012
N	0.20 REF		0.008 REF	
S	2.00	2.20	0.079	0.087



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