



**BSS127** 

# **Product Summary**

BV <sub>DSS</sub>	Rds(on)	Package	I <sub>D</sub> T <sub>A</sub> = +25°C	
600V	160Ω @ V <sub>GS</sub> = 10V	SC59 SOT23	70mA	

# Description

This new generation uses advanced planar technology MOSFET, provide excellent high voltage and fast switching, making it ideal for small-signal and level shift applications.

# Applications

- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

#### N-CHANNEL ENHANCEMENT MODE FIELD MOSFET

### Features

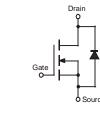
- Low Input Capacitance
- High BV<sub>DSS</sub> Rating for Power Application
- Low Input/Output Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

# **Mechanical Data**

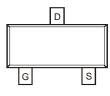
- Case: SC59 / SOT23
- Case Material: Molded Plastic "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 (3)
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)



Top View



Equivalent Circuit



Top View

### Ordering Information (Note 4)

Part Number	Case	Packaging
BSS127SSN-7	SC59	3000/Tape & Reel
BSS127S-7	SOT23	3000/Tape & Reel

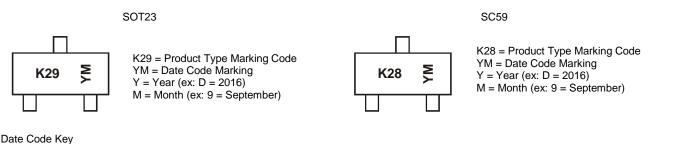
Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

# **Marking Information**



Date Code Key												
Year	201	3	2014		2015	20	016	2017	'	2018		2019
Code	A		В		С		D	E		F		G
Month	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



# Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	V <sub>DSS</sub>	600	V		
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) $V_{GS}$ = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	50 40	mA
Continuous Drain Current (Note 6) $V_{GS}$ = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	70 55	mA
Continuous Drain Current (Note 5) $V_{GS} = 5V$	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	45 35	mA
Continuous Drain Current (Note 6) $V_{GS} = 5V$	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	65 50	mA
Pulsed Drain Current @ T <sub>SP</sub> = +25°C (Note 7)	I <sub>DM</sub>	0.16	А		

# **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation, $@T_A = +25^{\circ}C$ (Note 5)	PD	0.61	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^{\circ}C$ (Note 5)	R <sub>θJA</sub>	204	°C/W
Power Dissipation, $@T_A = +25^{\circ}C$ (Note 6)	PD	1.25	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^{\circ}C$ (Note 6)	R <sub>0JA</sub>	100	°C/W
Operating and Storage Temperature Range	TJ, T <sub>STG</sub>	-55 to +150	°C

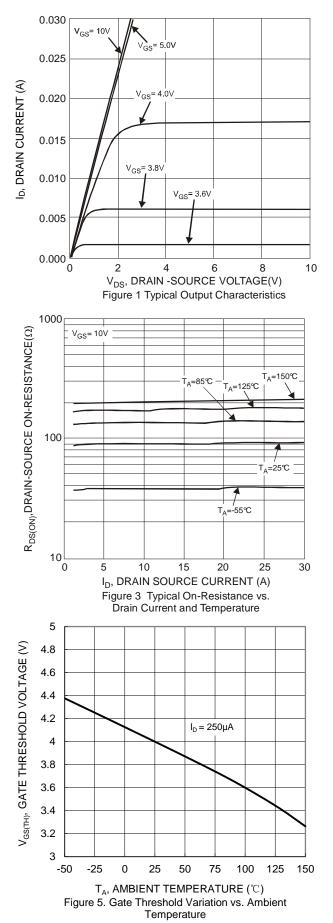
# Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

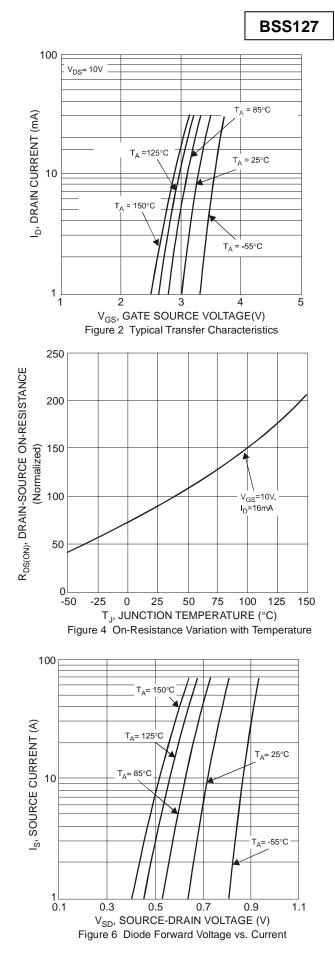
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	600	—	_	V	$V_{GS} = 0V, I_D = 250 \mu A$
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	_	—	0.1	μA	$V_{DS} = 600V, V_{GS} = 0V$
Gate-Body Leakage	Igss	_	—	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	3	—	4.5	V	$V_{DS} = V_{GS}$ , $I_D = 250 \mu A$
Static Drain-Source On-Resistance	P	_	80	160	Ω	$V_{GS} = 10V, I_D = 16mA$
	R <sub>DS(ON)</sub>		95	190	12	$V_{GS} = 5.0V, I_D = 16mA$
Forward Transfer Admittance	Y <sub>fs</sub>		76	_	mS	$V_{DS} = 10V, I_D = 16mA$
Diode Forward Voltage	V <sub>SD</sub>	-	—	1.5	V	$V_{GS} = 0V, I_{S} = 16mA$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	Ciss	—	21.8	—		
Output Capacitance	Coss		2.2	_	pF	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$
Reverse Transfer Capacitance	Crss	-	0.3	_		
Total Gate Charge	Qg	_	1.08	—		
Gate-Source Charge	Q <sub>gs</sub>	—	0.08	—	nC	$V_{GS} = 10V, V_{DD} = 300V,$ $I_{D} = 0.01A$
Gate-Drain Charge	Q <sub>gd</sub>	_	0.50	—		ID = 0.01A
Turn-On Delay Time	t <sub>D(ON)</sub>	_	5.0	_	ns	
Turn-On Rise Time	t <sub>R</sub>	_	7.2	_	ns	$V_{DD} = 300V, V_{GS} = 10V,$
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	28.7	_	ns	$-R_{GEN} = 6\Omega,$ $-I_D = 10mA$
Turn-Off Fall Time	tF	_	168	_	ns	
Reverse Recovery Time	t <sub>RR</sub>	_	131	—	ns	V <sub>R</sub> =300V, I <sub>F</sub> =0.016A,
Reverse Recovery Charge	Q <sub>RR</sub>	_	32	—	nC	di/dt = 100A/µs

Notes:

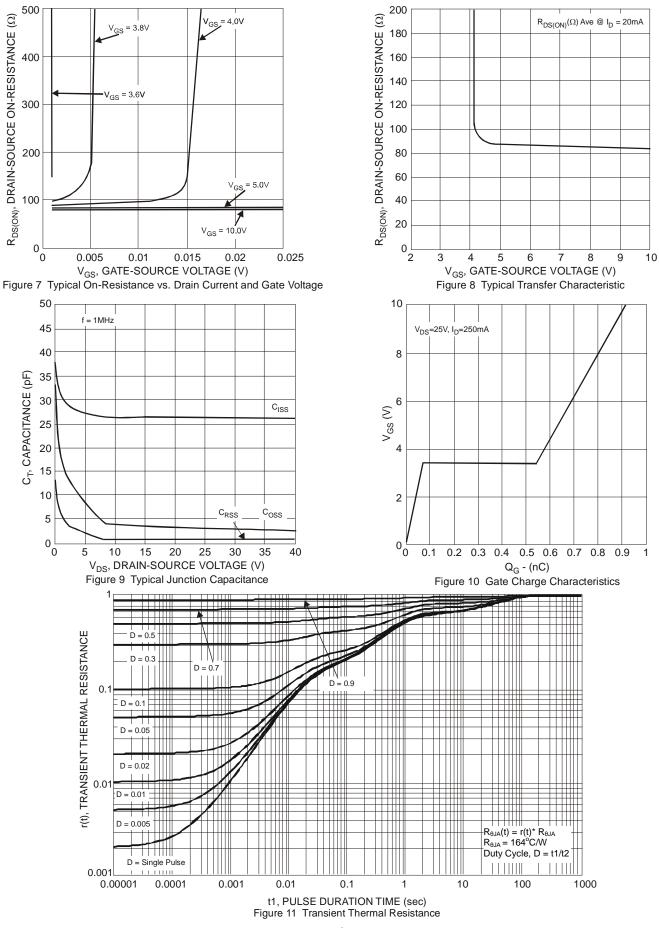
5. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2 oz. Copper, single sided.
7. Repetitive rating, pulse width limited by junction temperature, 10µs pulse, duty cycle = 1%.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.











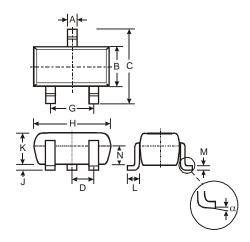


**BSS127** 

# **Package Outline Dimensions**

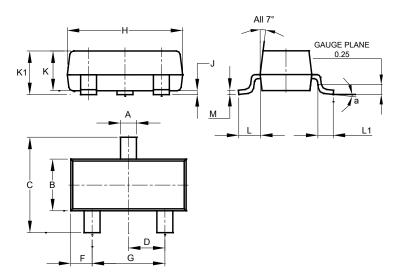
Please see http://www.diodes.com/package-outlines.html for the latest version.

#### SC59



SC59					
Dim	Min	Max	Тур		
Α	0.35	0.50	0.38		
в	1.50	1.70	1.60		
С	2.70	3.00	2.80		
D	-	-	0.95		
G	-	-	1.90		
Н	2.90	3.10	3.00		
J	0.013	0.10	0.05		
к	1.00	1.30	1.10		
L	0.35	0.55	0.40		
М	0.10	0.20	0.15		
N	0.70	0.80	0.75		
α	0°	8°	-		
All	Dimens	ions in	mm		

### SOT23

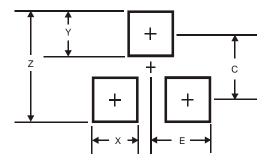


SOT23					
Dim	Min	Max	Тур		
Α	0.37	0.51	0.40		
В	1.20	1.40	1.30		
C	2.30	2.50	2.40		
D	0.89	1.03	0.915		
F	0.45	0.60	0.535		
G	1.78	2.05	1.83		
Н	2.80	3.00	2.90		
J	0.013	0.10	0.05		
ĸ	0.890	1.00	0.975		
K1	0.903	1.10	1.025		
L	0.45	0.61	0.55		
L1	0.25	0.55	0.40		
М	0.085	0.150	0.110		
а	0°	8°			
All	All Dimensions in mm				

# Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

#### SC59



Dimensions	Value (in mm)
Z	3.4
Х	0.8
Y	1.0
С	2.4
E	1.35

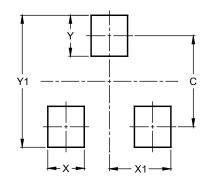


**BSS127** 

### Suggested Pad Layout (cont.)

Please see http://www.diodes.com/package-outlines.html for the latest version.

#### SOT23



Dimensions	Value (in mm)
С	2.0
Х	0.8
X1	1.35
Y	0.9
Y1	2.9

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