

## Product Summary

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V) @ +25°C	I <sub>R</sub> Max (mA) @+25°C
40	1	0.51	0.1

## Description and Applications

The SBR140S1FQ is a single rectifier packaged in SOD123F. Offering low V<sub>F</sub> and excellent high temperature stability this device is ideal for use in general rectification applications as a:

- Boost Diode
- Blocking Diode

## Features and Benefits

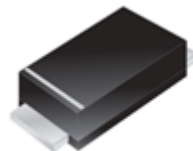
- Low Forward Voltage (V<sub>F</sub>) Minimizes Conduction Losses and Improving Efficiency
- Reduced High Temperature Reverse Leakage; Increased Reliability against Thermal Runaway Failure in High Temperature Operation
- Patented Super Barrier Rectifier SBR<sup>®</sup> Technology
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The SBR140S1FQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

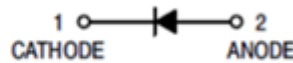
## Mechanical Data

- Case: SOD123F
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Polarity: Cathode Band
- Weight: 0.015 grams (Approximate)

SOD123F



Top View



Schematic View

## Ordering Information (Note 4)

Part Number	Case	Packaging
SBR140S1FQ-7	SOD123F	3,000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



F4 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: G = 2019)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019	2020
Code	A	B	C	D	E	F	G	H

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

SBR is a registered trademark of Diodes Incorporated.

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

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	40	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>RM</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Rectified Output Current	I <sub>O</sub>	1	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	30	A

Characteristic	Symbol	Ratings	Unit
Human Body Mode ESD Protection	ESD HBM	4000	V
Machine Model ESD Protection	ESD MM	400	V
Charged Device Model	ESD CDM	1	kV

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance Junction to Case (Note 5)	R <sub>θJC</sub>	35	°C/W
Thermal Resistance Junction to Ambient (Note 5)	R <sub>θJA</sub>	100	
Thermal Resistance Junction to Ambient (Note 6)	R <sub>θJA</sub>	95	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	V <sub>(BR)R</sub>	40	—	—	V	I <sub>R</sub> = 200μA
Forward Voltage Drop	V <sub>F</sub>	—	0.29	—	V	I <sub>F</sub> = 0.1A, T <sub>J</sub> = +25°C
			0.42	0.51		I <sub>F</sub> = 1A, T <sub>J</sub> = +25°C
			0.38	—		I <sub>F</sub> = 1A, T <sub>J</sub> = +125°C
Leakage Current (Note 7)	I <sub>R</sub>	—	5	—	μA	V <sub>R</sub> = 10V, T <sub>J</sub> = +25°C
			10	100	μA	V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C
			3	—	mA	V <sub>R</sub> = 40V, T <sub>J</sub> = +125°C
Total Capacitance	C <sub>T</sub>	—	110	—	pF	V <sub>R</sub> = 4V, f = 1MHz
			35			V <sub>R</sub> = 10V, f = 1MHz
			22			V <sub>R</sub> = 40V, f = 1MHz

- Notes:
- Device mounted on FR-4 substrate, 0.4"\*0.5", 2oz, single-sided, PC boards with 0.2"\*0.25" copper pad.
  - Device mounted on FR-4 substrate, 25.4\*25.4mm, 2oz, single-sided, PC boards with 2.1\*2.1mm copper pad.
  - Short duration pulse test used to minimize self-heating effect.

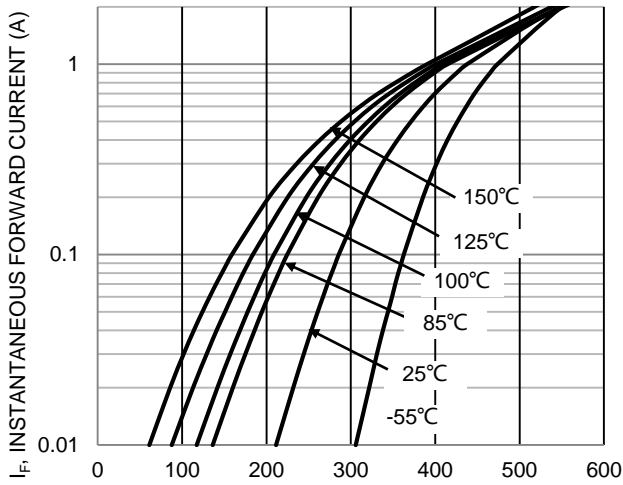


Figure 1. Typical Forward Characteristics

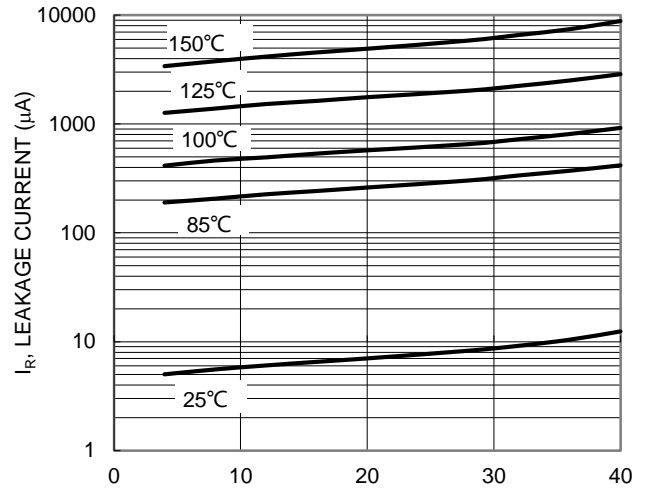


Figure 2. Typical Reverse Characteristics

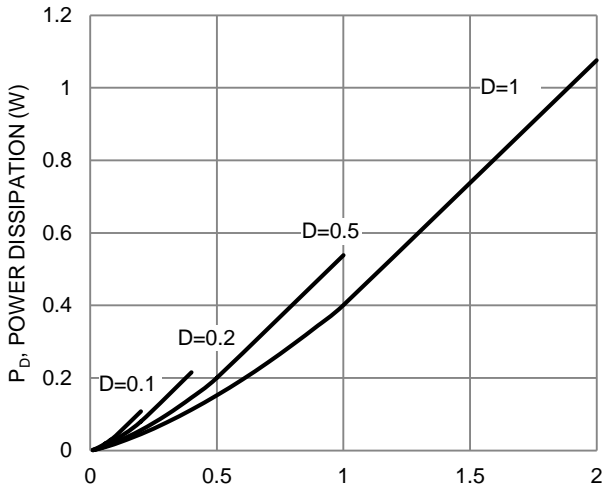


Figure 3. Forward Power Dissipation  $T_J=125^\circ\text{C}$

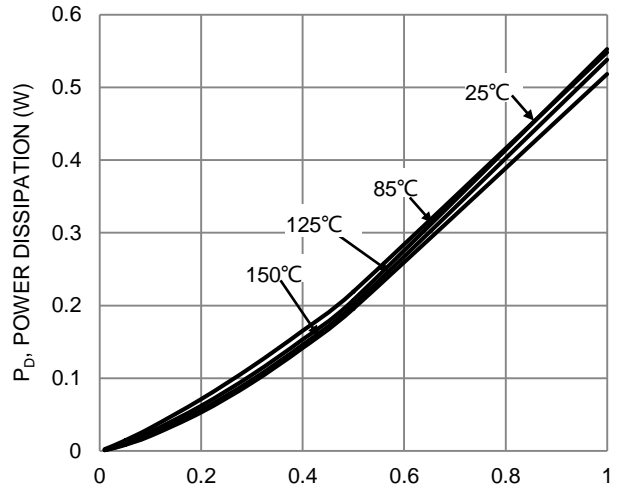


Figure 4. Forward Power Dissipation  $D=0.5$

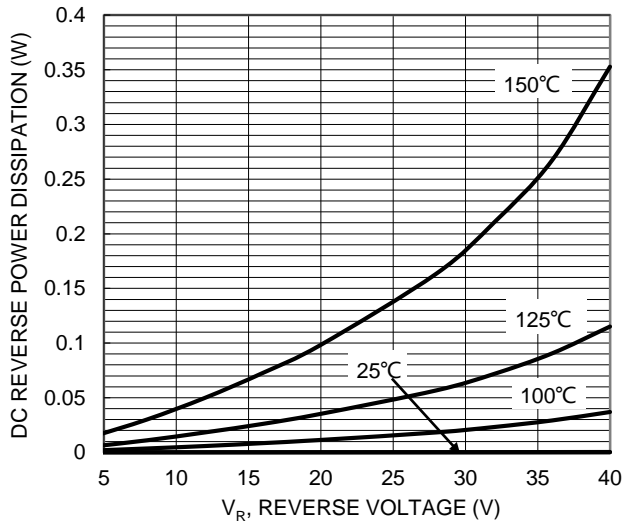


Figure 5. Typical Reverse Power Dissipation

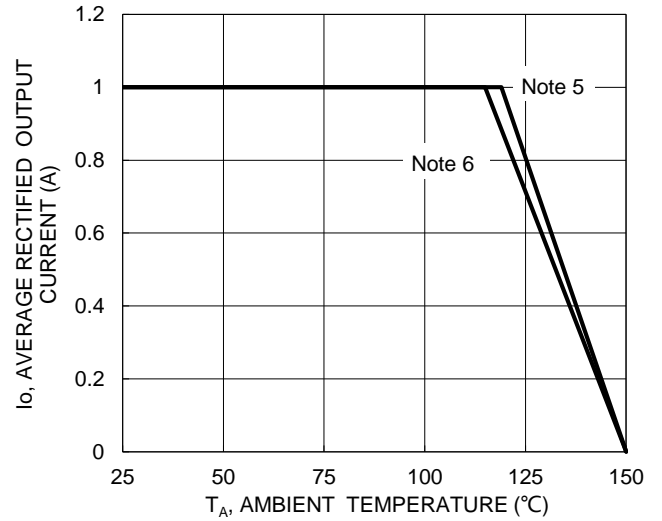
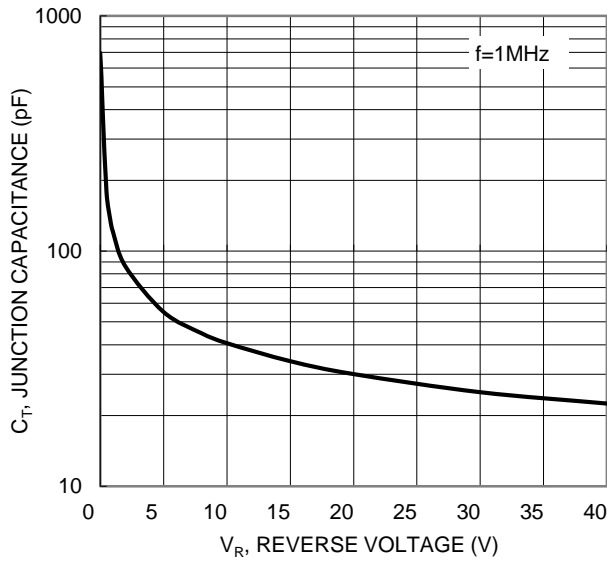


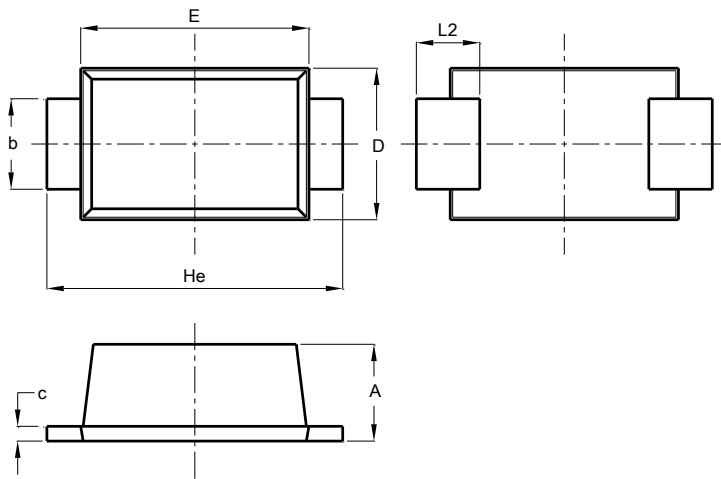
Figure 6. DC Forward Current Derating



### Package Outline Dimensions

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

#### SOD123F

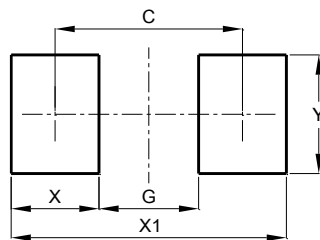


SOD123F			
Dim	Min	Max	Typ
A	0.81	1.15	-
b	0.80	1.05	-
c	0.05	0.30	-
D	1.70	1.90	1.80
E	2.60	2.80	2.70
He	3.30	3.70	3.50
L2	0.35	0.85	-
<b>All Dimensions in mm</b>			

### Suggested Pad Layout

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

#### SOD123F



Dimensions	Value (in mm)
C	2.86
G	1.52
X	1.34
X1	4.20
Y	1.80

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