

## 0.5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

### Product Summary (@T<sub>A</sub> = +25°C)

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max	I <sub>R</sub> Max
40	0.5	0.51V	10μA

### Features and Benefits

- Low Forward Voltage Drop
- Guard Ring Construction for Transient Protection
- High Conductance
- **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**
- **PPAP Capable (Note 4)**

### Applications

- DC-DC Converters
- Mobile Telecommunications
- Blocking Diodes
- Reverse Polarity Protection

### Mechanical Data

- Case: SOD123
- 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 Alloy 42 Leadframe. (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 <sup>(E)</sup>
- Polarity: Cathode Band
- Weight: 0.01 grams (Approximate)

SOD123



Top View

### Ordering Information (Note 5)

Part Number	Case	Packaging
B0540WQ-7-F	SOD123	3,000/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](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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/product-compliance-definitions/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

### Marking Information



SF = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

#### Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022
Code	D	E	F	G	H	I	J

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

### 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>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Rectified Output Current (See Figure 4)	I <sub>O</sub>	0.5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	5.5	A

### Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Ambient Air (Note 6) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	385	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	325	—	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150		°C

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

Characteristic	Symbol	Value	Unit	Test Conditions
Minimum Reverse Breakdown Voltage (Note 8)	V <sub>(BR)R</sub>	40	V	I <sub>R</sub> = 20μA
Maximum Forward Voltage Drop	V <sub>FM</sub>	0.510	V	I <sub>F</sub> = 0.5A, T <sub>J</sub> = +25°C
		0.620		I <sub>F</sub> = 1.0A, T <sub>J</sub> = +25°C
		0.460		I <sub>F</sub> = 0.5A, T <sub>J</sub> = +100°C
Maximum Leakage Current (Note 8)	I <sub>RM</sub>	10	μA	V <sub>R</sub> = 20V, T <sub>J</sub> = +25°C
		20		V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C
		5.0	mA	V <sub>R</sub> = 20V, T <sub>J</sub> = +100°C
13	V <sub>R</sub> = 40V, T <sub>J</sub> = +100°C			
Total Capacitance	C <sub>T</sub>	170	pF	f = 1MHz, V <sub>R</sub> = 0V

- Notes:
6. FR-4 PCB, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  7. Polyimide PCB, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  8. Short duration pulse test used to minimize self-heating effect.

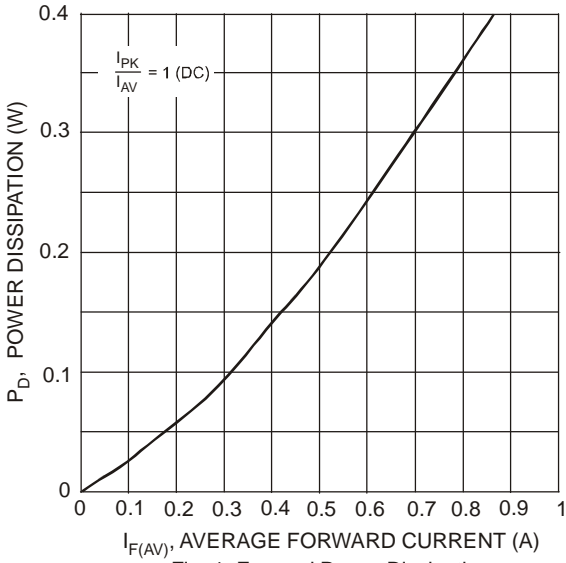


Fig. 1 Forward Power Dissipation

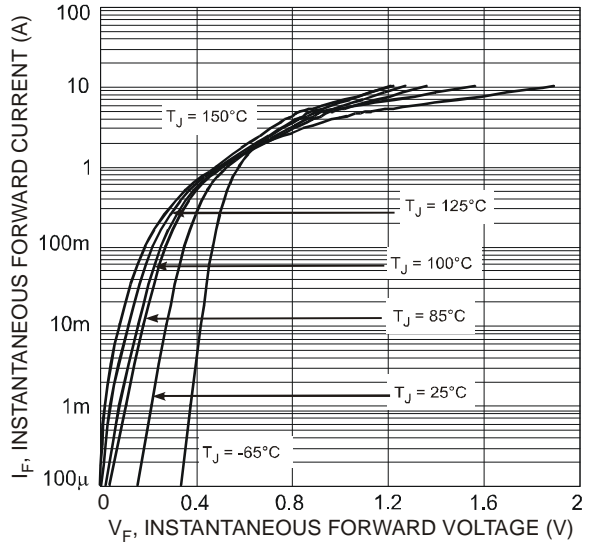


Fig. 2 Typical Forward Characteristics

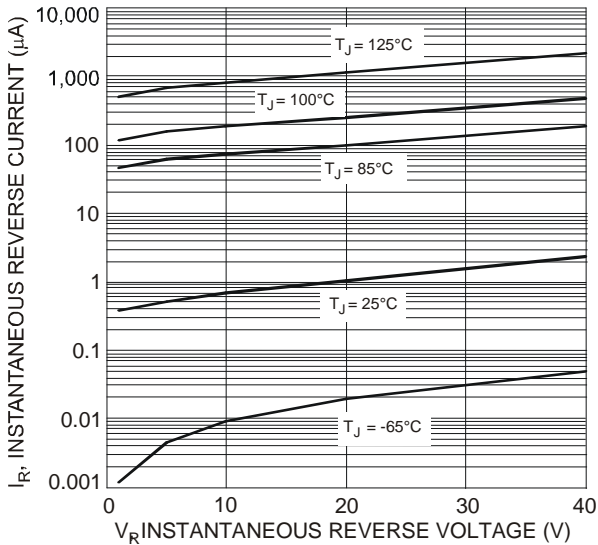


Fig. 3 Typical Reverse Characteristics

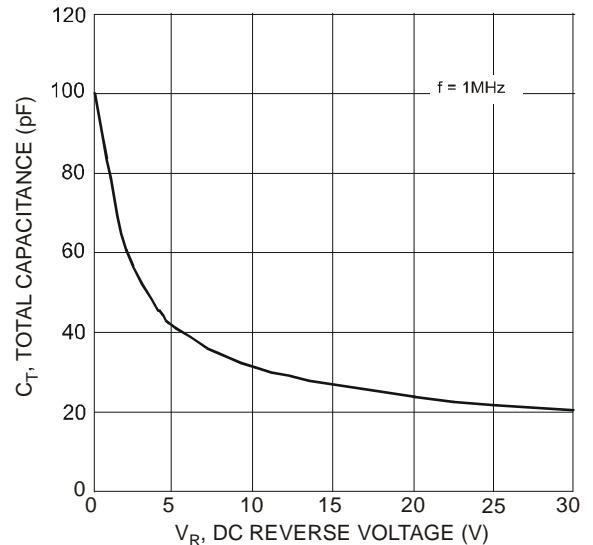


Fig. 4 Total Capacitance vs. Reverse Voltage

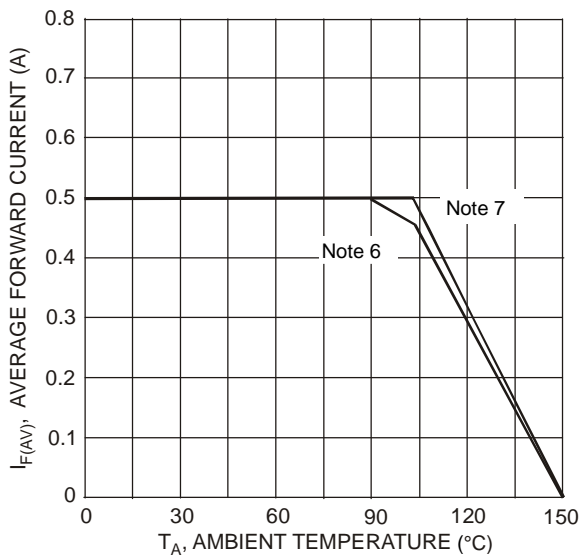
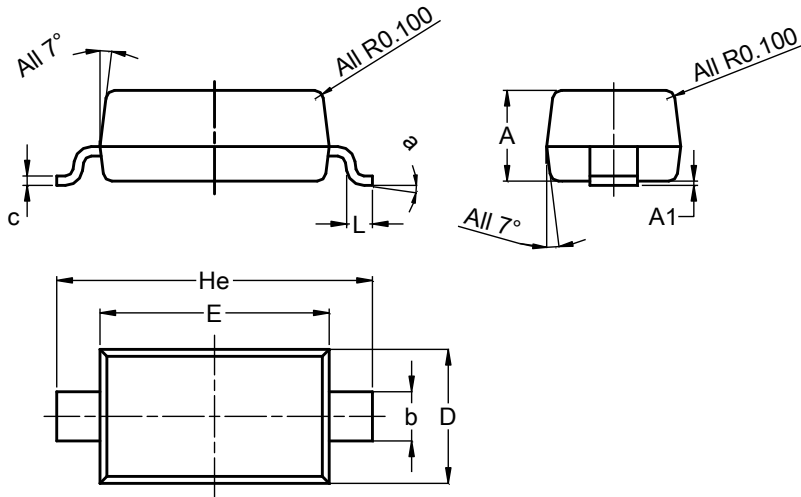


Fig. 5 Forward Current Derating Curve

**Package Outline Dimensions**

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

**SOD123**

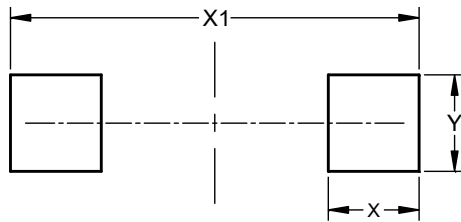


SOD123			
Dim	Min	Max	Typ
A	1.00	1.35	1.05
A1	0.00	0.10	0.05
b	0.52	0.62	0.57
c	0.10	0.15	0.11
D	1.40	1.70	1.55
E	2.55	2.85	2.65
He	3.55	3.85	3.65
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOD123**



Dimensions	Value (in mm)
X	0.900
X1	4.050
Y	0.950

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