



**THE DATASHEET OF  
SBR05U40CSP-7**





### Product Summary

V <sub>RRM</sub> (V)	I <sub>O</sub> (mA)	V <sub>Fmax</sub> (V)@ +25°C	I <sub>R max</sub> (μA)@ +25°C
40	500	0.46	75

### Description and Applications

The SBR05U40CSP is a 40-volt 0.5A super barrier rectifier (SBR) that is optimized for low forward voltage drop and low leakage current, housed in a compact chip scale package (CSP) that occupies only 0.6mm<sup>2</sup> board-space. The low thermal resistance enables designers to meet design challenges of increasing efficiency whilst at the same time reducing board space. It is ideally suited for use in portable applications as a:

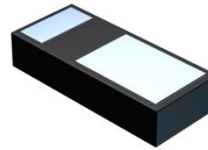
- Blocking diode
- Boost diode
- Switching diode
- Reverse protection diode

### Features and Benefits

- Off Board Profile of 0.3mm – More Than 30% Thinner Than DFN1006
- 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
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

### Mechanical Data

- Case: X2-WLB1006-2
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Tin. Solderable per MIL-STD-202, Method 208 <sup>(e3)</sup>
- Polarity: Cathode Dot
- Weight: 0.001 grams



### Ordering Information (Note 4)

Part Number	Case	Packaging
SBR05U40CSP-7	X2-WLB1006-2	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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

### Marking Information

Pin 1



H3= Product Type Marking Code  
 YM=Date Code Marking  
 Y= Year (ex: A= 2013)  
 M=Month (ex: 9= September)  
 Dot denotes Cathode Pin

#### Date Code Key

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

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 capacitance load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	40	V
Average Rectified Output Current	I <sub>O</sub>	500	mA
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	12	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	R <sub>θJA</sub>	130	°C/W
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
Forward Voltage Drop	V <sub>F</sub>	—	0.30	0.36	V	I <sub>F</sub> = 100mA
		—	0.43	0.46		I <sub>F</sub> = 500mA
		—	0.40	—		I <sub>F</sub> = 500mA, T <sub>J</sub> = +125°C
Reverse Current (Note 6)	I <sub>R</sub>	—	4	15	μA	V <sub>R</sub> = 10V
		—	8	75		V <sub>R</sub> = 40V
Junction Capacitance	C <sub>j</sub>	—	34	—	pF	V <sub>R</sub> = 4V, f = 1MHz

Notes: 5. Device mounted on FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.

6. Short duration pulse test used to minimize self-heating effect.

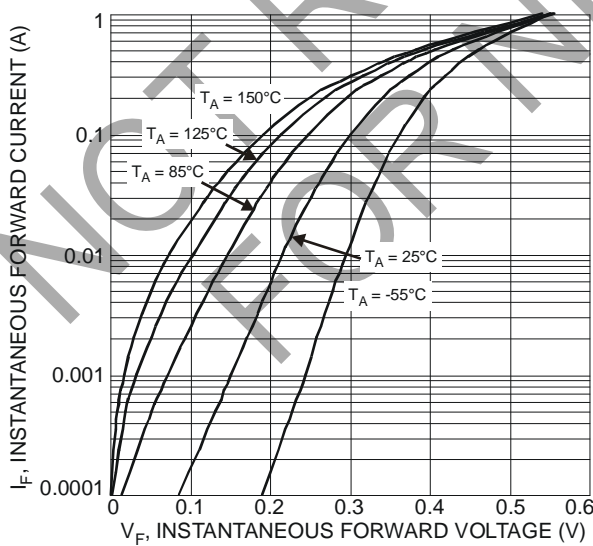


Figure 1 Typical Forward Characteristics

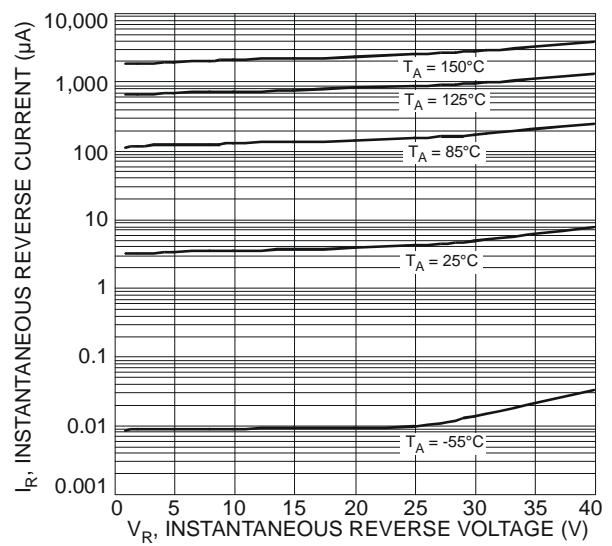


Figure 2 Typical Reverse Characteristics

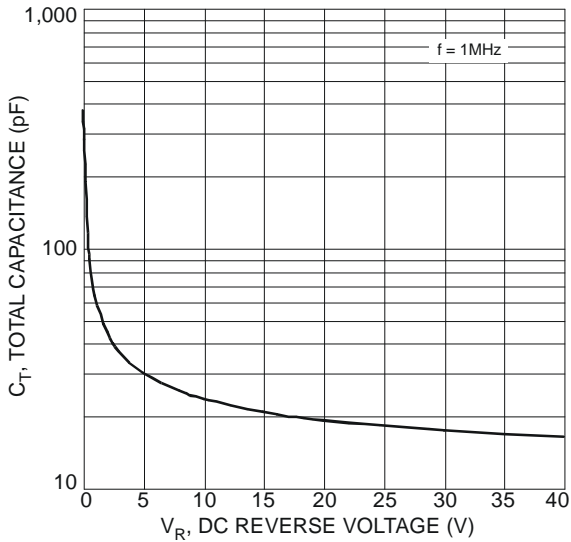


Figure 3 Total Capacitance vs. Reverse Voltage

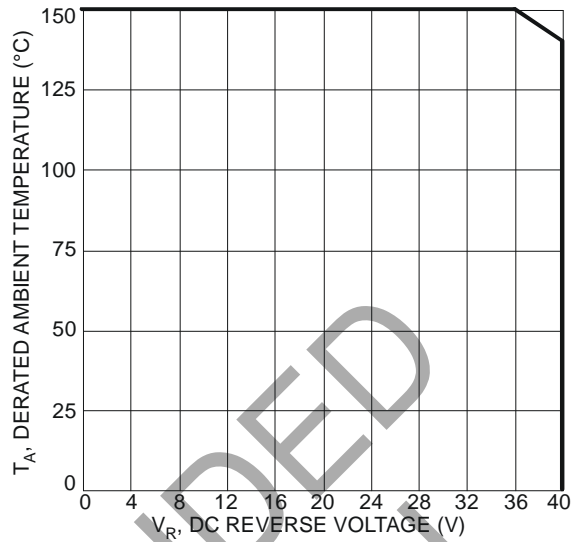
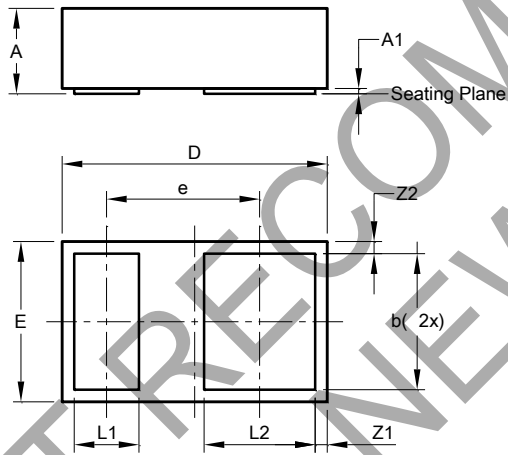


Figure 4 Operating Temperature Derating

**Package Outline Dimensions**

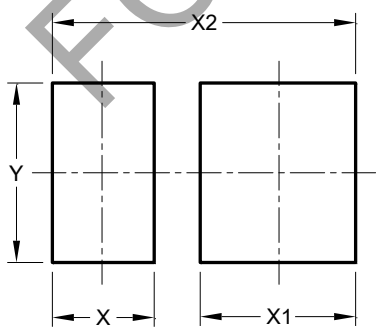
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



X2-WLB1006-2			
Dim	Min	Max	Typ
A	0.27	0.35	0.30
A1	00	0.03	0.02
b	0.459	0.559	0.509
D	0.95	1.05	1.000
E	0.55	0.65	0.600
e	-	-	0.578
L1	0.194	0.294	0.244
L2	0.369	0.469	0.419
Z1	0.016	0.076	0.046
Z2	0.016	0.076	0.046
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
X	0.332
X1	0.507
X2	0.989
Y	0.579

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