

## 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	0.2	0.59	0.01

## Description and Applications

Packaged in X1-DFN1006-2 (SWP) (Type C) package, provides very low V<sub>F</sub> and excellent reverse-leakage stability at high temperatures. It is ideal for use as a rectifier, freewheel diode or blocking diode in:

- DC-DC converters
- AC-DC adaptors

## Features and Benefits

- Patented Trench Super Barrier Rectifier SBR<sup>®</sup> Technology
- With Visible And Solderable Side Pads
- Ultra-Low Forward Voltage Drop
- Superior Reverse Avalanche Capability
- Soft, Fast Switching Capability
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The SBR0240LPWQ 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

- Package: X1-DFN1006-2
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.001g (Approximate)

X1-DFN1006-2 (SWP) (Type C)



Top View



Bottom View

## Ordering Information (Note 4)

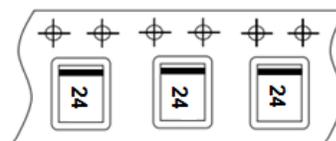
Part Number	Package	Packing	
		Qty.	Carrier
SBR0240LPWQ-7B	X1-DFN1006-2 (SWP) (Type C)	10,000	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  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



24 = Product Type Marking Code  
Bar Denotes Cathode



**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>		
Average Rectified Output Current (See Figure 1)	I <sub>O</sub>	200	mA
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load	I <sub>FSM</sub>	5	A
Electrostatic Discharge	HBM	4000	V
Electrostatic Discharge	MM	400	V
Electrostatic Discharge	CDM	1000	V

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Power Dissipation, T <sub>A</sub> = +25°C (Note 5)	P <sub>D</sub>	500	mW
Typical Power Dissipation, T <sub>A</sub> = +25°C (Note 6)	P <sub>D</sub>	1000	mW
Typical Thermal Resistance, Junction to Ambient, T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	250	°C/W
Typical Thermal Resistance, Junction to Ambient, T <sub>A</sub> = +25°C (Note 6)	R <sub>θJA</sub>	125	°C/W
Typical Thermal Resistance, Junction to Case, T <sub>A</sub> = +25°C (Note 5)	R <sub>θJC</sub>	35	°C/W
Typical Thermal Resistance, Junction to Case, T <sub>A</sub> = +25°C (Note 6)	R <sub>θJC</sub>	18	°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>	—	0.15	0.21	V	I <sub>F</sub> = 0.1mA, T <sub>J</sub> = +25°C
		—	0.22	0.28		I <sub>F</sub> = 1.0mA, T <sub>J</sub> = +25°C
		—	0.29	0.35		I <sub>F</sub> = 10mA, T <sub>J</sub> = +25°C
		—	0.38	0.49		I <sub>F</sub> = 100mA, T <sub>J</sub> = +25°C
		—	0.45	0.59		I <sub>F</sub> = 200mA, T <sub>J</sub> = +25°C
		—	0.42	0.56		I <sub>F</sub> = 200mA, T <sub>J</sub> = +125°C
Leakage Current (Note 7)	I <sub>R</sub>	—	1.5	—	μA	V <sub>R</sub> = 25V, T <sub>J</sub> = +25°C
		—	2.5	10		V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C
		—	500	—		V <sub>R</sub> = 40V, T <sub>J</sub> = +125°C
Total Capacitance	C <sub>T</sub>	—	8	—	pF	V <sub>R</sub> = 5V, f = 1MHz
Reverse Recovery Time	t <sub>RR</sub>	—	3.3	—	ns	I <sub>F</sub> = 10mA, I <sub>RRM</sub> = 0.1I <sub>R</sub> , T <sub>A</sub> = +25°C

Notes: 5. 1\*MRP FR-4 PC board 2oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.  
6. One inch square copper pad 2 oz.  
7. Short duration pulse test used to minimize self-heating effect.

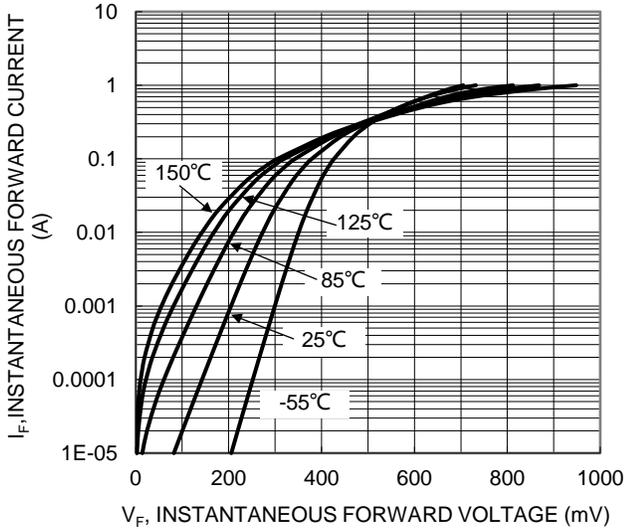


Fig. 1 Typical Forward Characteristics

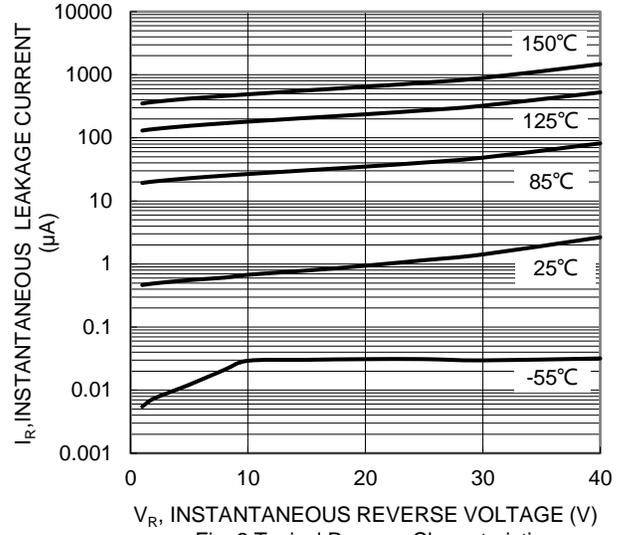


Fig. 2 Typical Reverse Characteristics

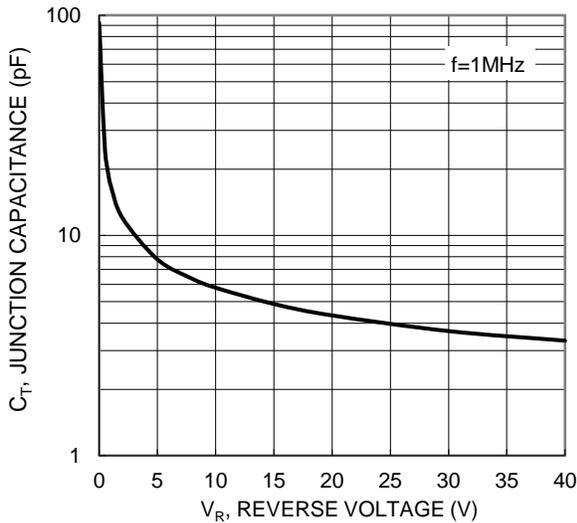


Fig. 3 Typical Junction Capacitance

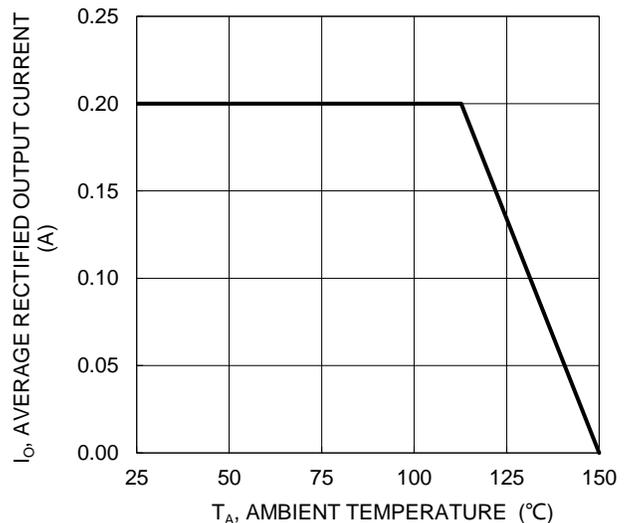


Fig. 4 DC Forward Current Derating

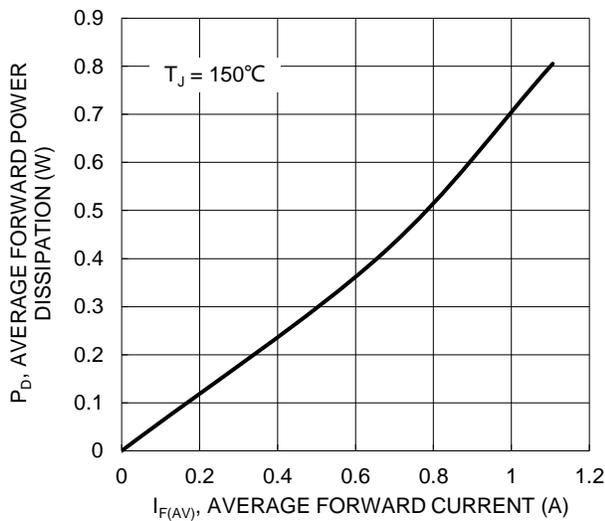


Fig. 5 Forward Power Dissipation

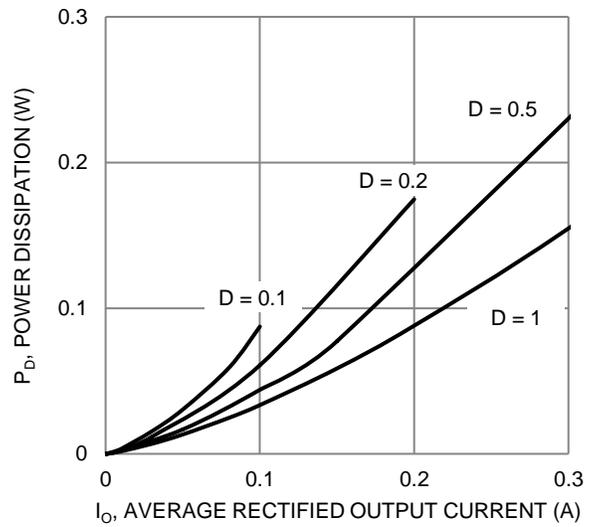


Fig. 6 Forward Power Dissipation  $T_J = 125^\circ\text{C}$

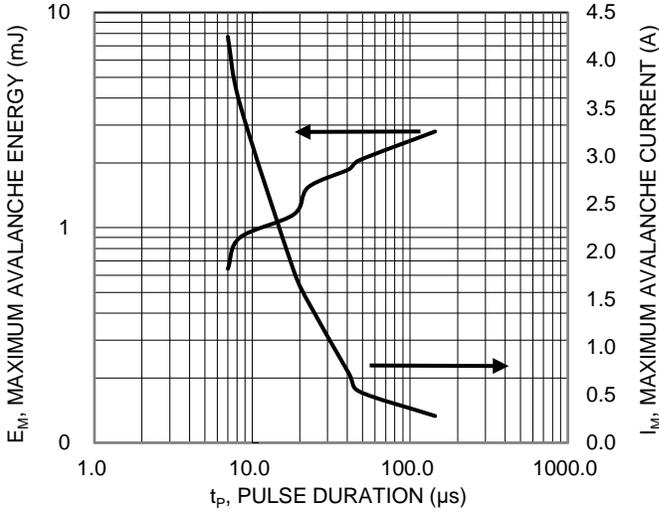


Fig. 7 Single Pulse Max. Avalanche Energy and Current

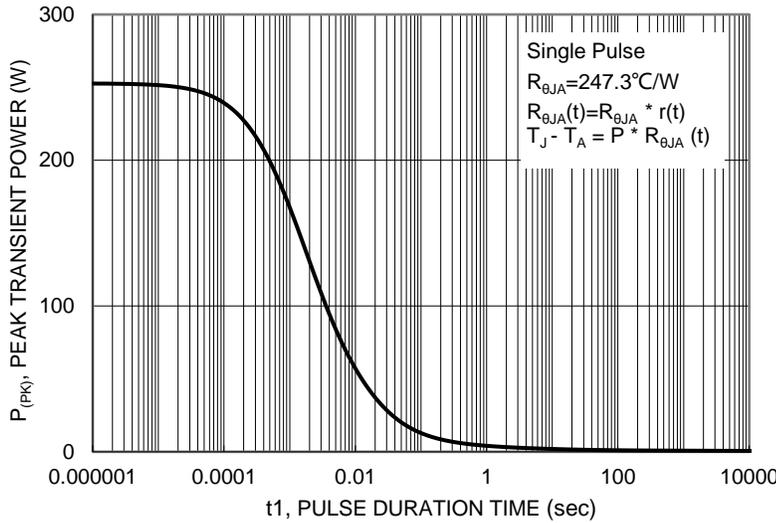


Fig. 8 Single Pulse Maximum Power Dissipation

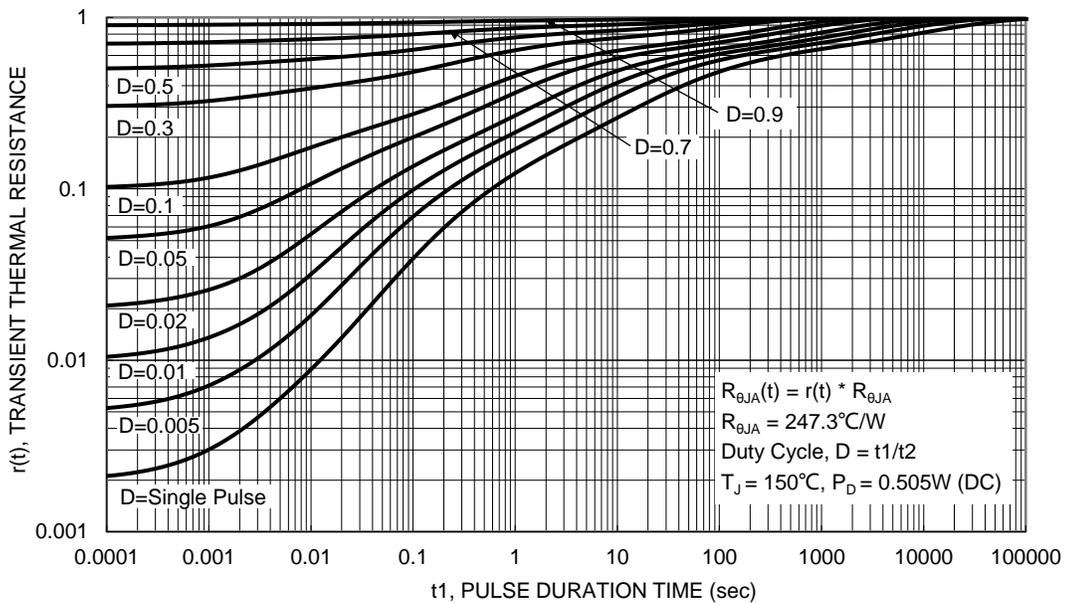
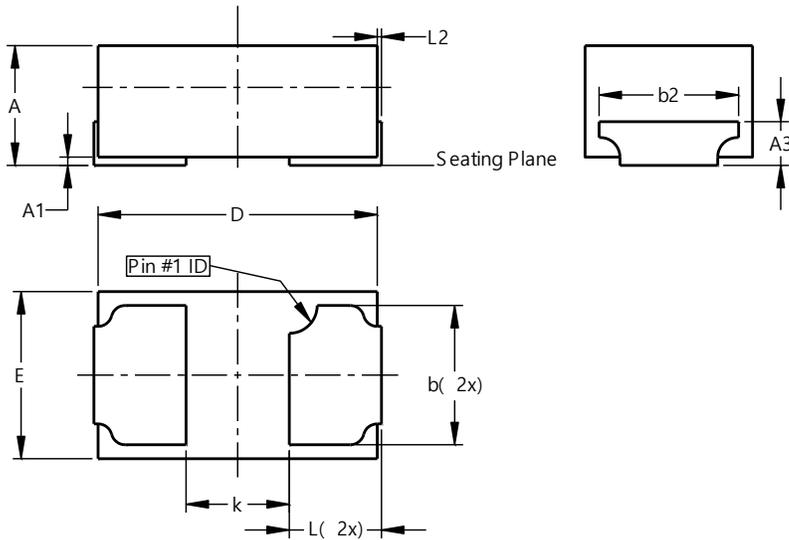


Fig. 9 Transient Thermal Resistance

## Package Outline Dimensions

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

**X1-DFN1006-2 (SWP) (Type C)**

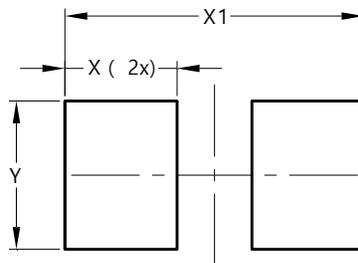


X1-DFN1006-2 (SWP) (Type C)			
Dim	Min	Max	Typ
A	0.37	0.47	0.42
A1	0.00	0.05	0.03
A3	0.17 REF		
b	0.47	0.57	0.52
b2	0.55 REF		
D	0.95	1.05	1.00
E	0.55	0.65	0.60
k	0.37 REF		
L	0.28	0.38	0.33
L2	0.15 REF		
All Dimensions in mm			

## Suggested Pad Layout

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

**X1-DFN1006-2 (SWP) (Type C)**



Dimensions	Value (in mm)
X	0.45
X1	1.20
Y	0.60

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