

## Product Summary

B520CQ/B530CQ/B540CQ

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V)	I <sub>R</sub> Max (mA)
20/30/40	5.0	0.55	0.5

B550CQ/B560CQ

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V)	I <sub>R</sub> Max (mA)
50/60	5.0	0.70	0.5

## Description and Applications

This Schottky Barrier Rectifier is designed to meet the general requirements of commercial applications. It is ideally suited for use as a:

- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

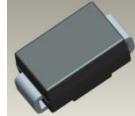
## Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- For Use in Low-Voltage, High-Frequency Inverters, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

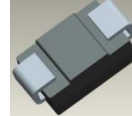
## Mechanical Data

- Case: SMC
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 Ⓜ
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.21 grams (Approximate)

### SMC



Top View



Bottom View

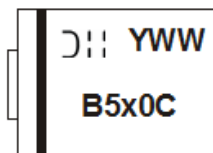
## Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
B5X0CQ-13-F	Automotive	SMC	3,000/Tape & Reel

\* xx = Device type, e.g. B520C-13-F (SMC package).

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  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 [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



B5x0C = Product Type Marking Code, ex: B540C (SMC package)  
 JII = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 4 for 2014)  
 WW = Week Code (01 to 53)  
 x = 2,3,4,5 or 6 - i.e., x = 4 for B540C

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

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

Characteristic	Symbol	B520C	B530C	B540C	B550C	B560C	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	20	30	40	50	60	V
Working Peak Reverse Voltage	$V_{RWM}$						
DC Blocking Voltage	$V_R$						
RMS Reverse Voltage	$V_{R(RMS)}$	14	21	28	35	42	V
Average Rectified Output Current	$I_O$	5.0					A
Non-Repetitive Peak Forward Surge Current, 8.3ms Single Half-Sine-Wave Superimposed on Rated Load	$I_{FSM}$	100					A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Terminal	$R_{\theta JT}$	10	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Operating Temperature Range	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	$V_F$	—	0.475 0.575	0.55 0.70	V	$I_F = 5.0\text{A}$ , $T_A = +25^\circ\text{C}$
Leakage Current (Note 7)	$I_R$	—	—	0.5 20	mA	@ Rated $V_R$ , $T_A = +25^\circ\text{C}$ @ Rated $V_R$ , $T_A = +100^\circ\text{C}$
Total Capacitance	$C_T$	—	—	300	pF	$V_R = 4\text{V}$ , $f = 1\text{MHz}$

Notes: 6. Thermal Resistance: Junction to ambient, unit mounted on PC board with 8.0 mm<sup>2</sup> (0.033 mm thick) copper pads as heat sink.  
7. Short duration pulse test used to minimize self-heating effect.

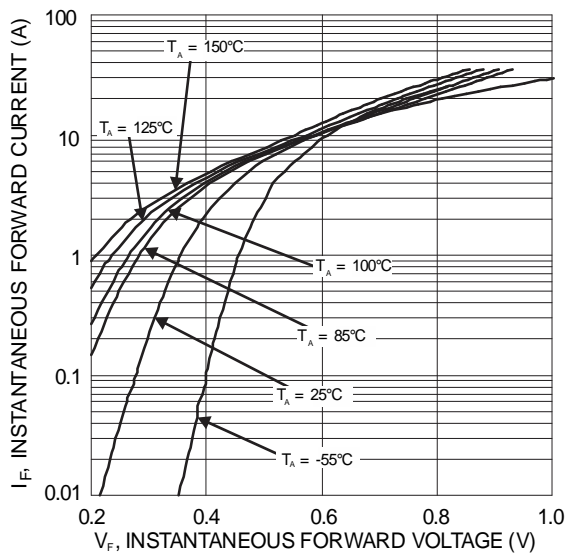


Figure 1 Typical Forward Characteristics (B520C - B540C)

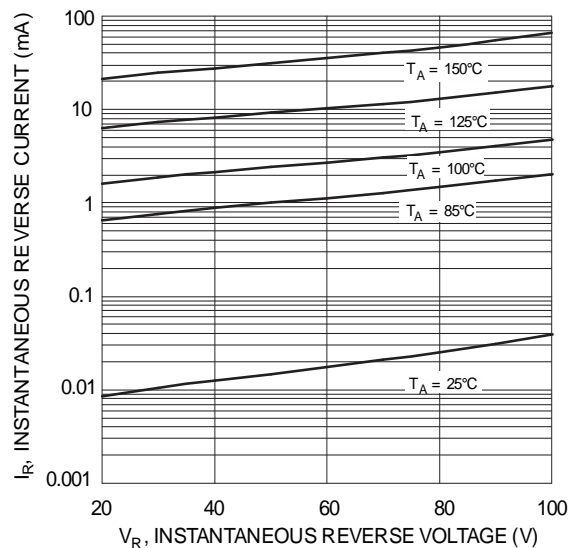
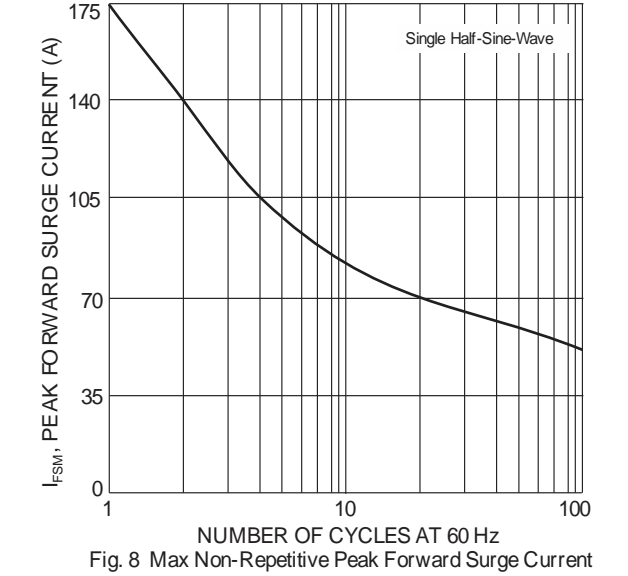
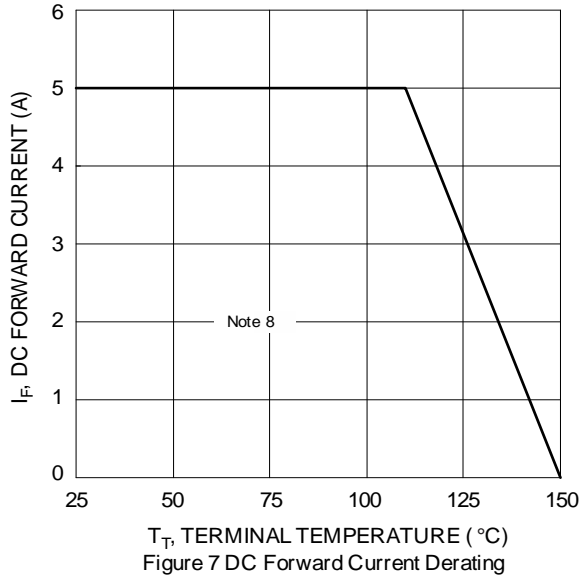
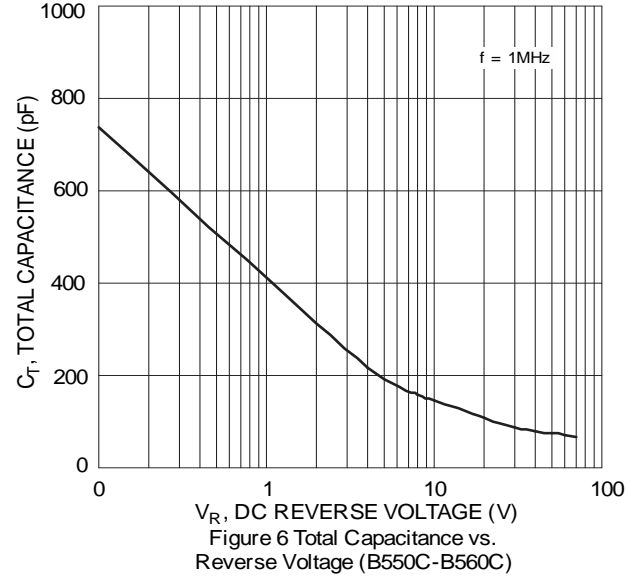
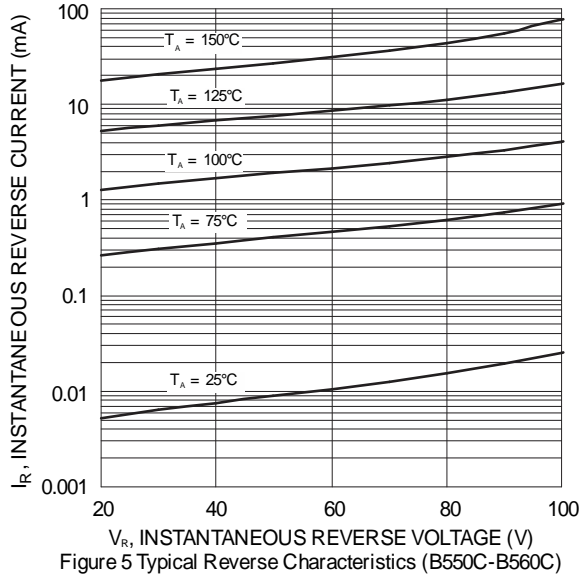
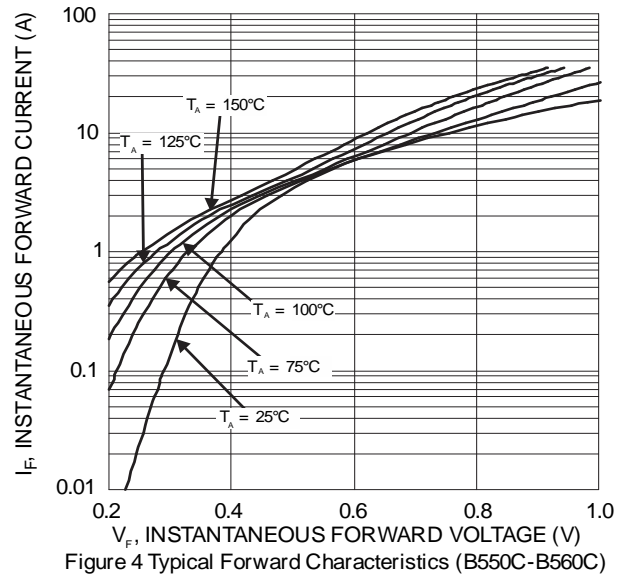
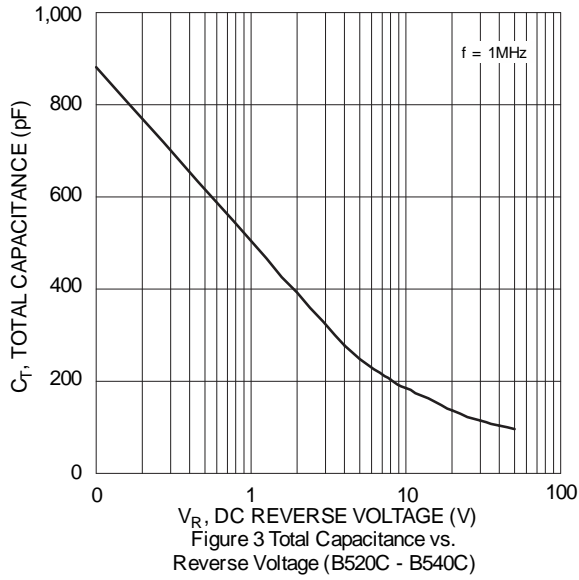


Figure 2 Typical Reverse Characteristics (B520C - B540C)

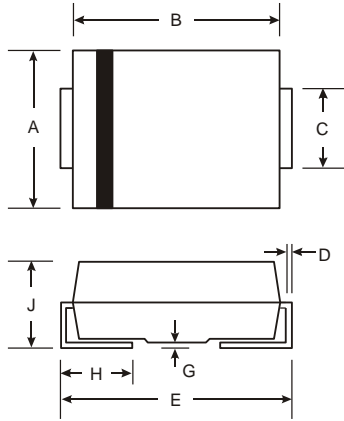


Note: 8. Device mounted on FR-4 substrate, 1" x 1", 2oz, single-sided, PC boards with 0.56" x 0.73" copper pad.

**Package Outline Dimensions**

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

**SMC**

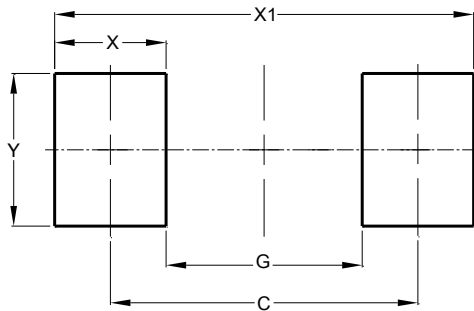


SMC		
Dim	Min	Max
A	5.59	6.22
B	6.60	7.11
C	2.75	3.18
D	0.15	0.31
E	7.75	8.13
G	0.10	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

**Suggested Pad Layout**

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

**SMC**



Dimensions	Value (in mm)
C	6.90
G	4.40
X	2.50
X1	9.40
Y	3.30

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