



**THE DATASHEET OF
B520CQ-13-F**



Product Summary

B520CQ/B530CQ/B540CQ

V _{RRM} (V)	I _O (A)	V _F Max (V)	I _R Max (mA)
20/30/40	5.0	0.55	0.5

B550CQ/B560CQ

V _{RRM} (V)	I _O (A)	V _F Max (V)	I _R 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

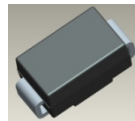
Features and Benefits

- 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)**

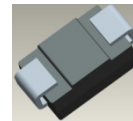
Mechanical Data

- 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 (E3)
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.21 grams (Approximate)

SMC



Top View



Bottom View

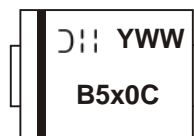
Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
B5X0CQ-13-F	Automotive	SMC	3000/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) & 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 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)

DII = 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°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}							
Working Peak Reverse Voltage	V _{RWM}	20	30	40	50	60	V	
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
Electrostatic Discharge	HBM	4000						V
Electrostatic Discharge	MM	400						V
Electrostatic Discharge	CDM	1						KV

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Terminal	R _{θJT}	10	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	50	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	R _{θJA}	115	°C/W
Thermal Resistance, Junction to Ambient (Note 8)	R _{θJA}	30	°C/W
Operating Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°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 = 5.0A, T _A = +25°C
Leakage Current (Note 7)	I _R	—	—	0.5 20	mA	@ Rated V _R , T _A = +25°C @ Rated V _R , T _A = +100°C
Total Capacitance	C _T	—	—	300	pF	V _R = 4V, f = 1MHz
Switching Speed t _{RR}	t _{RR}	—	16	—	ns	I _F =0.5A, I _R =1A, I _{RR} =0.25A (RG1)

Notes: 6. Thermal Resistance: Junction to ambient, unit mounted on PC board with 8.0mm² (0.033mm thick) copper pads as heatsink.
7. MRP FR-4 PCB, 2oz.
8. With 50mm × 50mm × 23mm Al heatsink.
9. Short duration pulse test used to minimize self-heating effect.

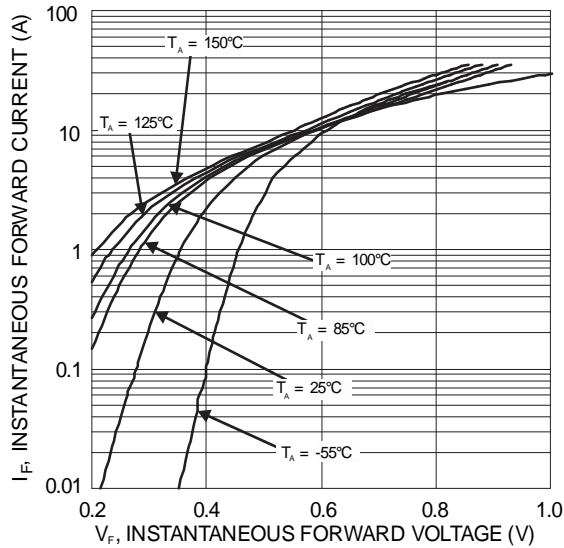


Figure 1 Typical Forward Characteristics (B520C - B540C)

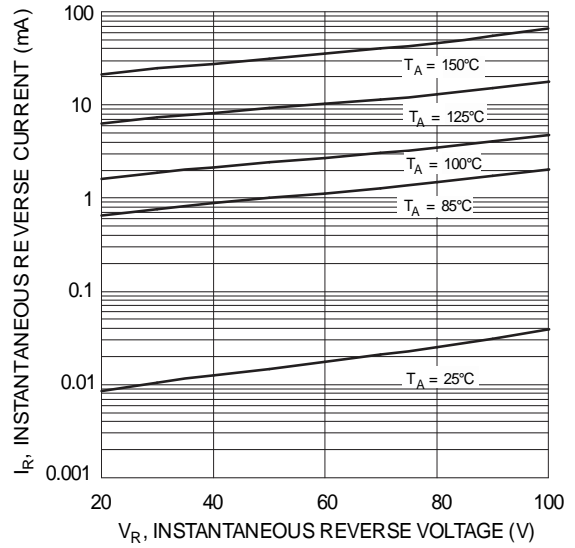


Figure 2 Typical Reverse Characteristics (B520C - B540C)

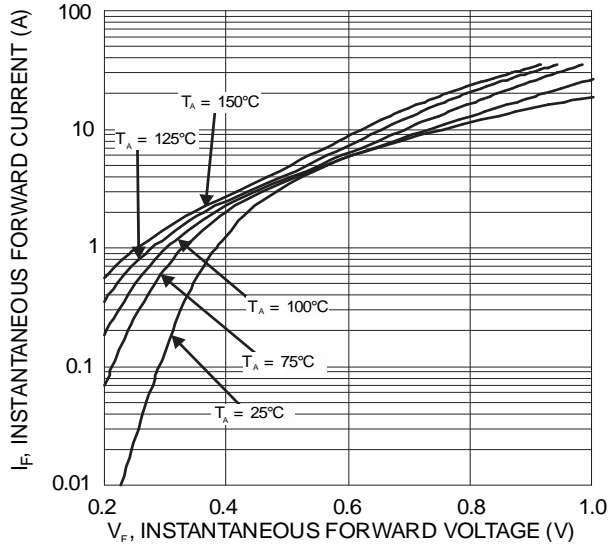


Figure 3 Typical Forward Characteristics (B550C-B560C)

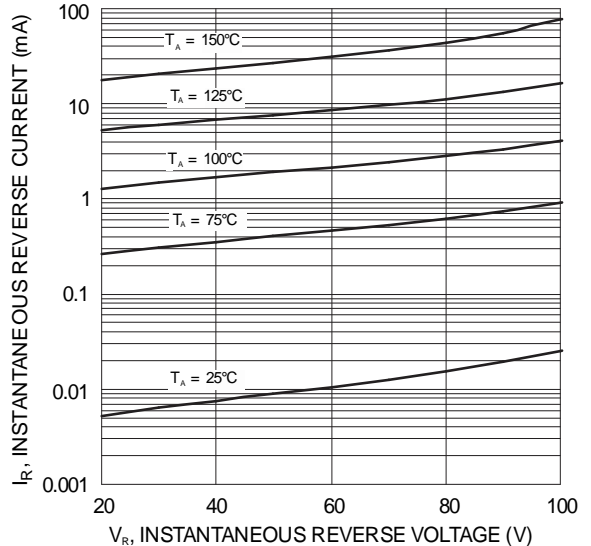


Figure 4 Typical Reverse Characteristics (B550C-B560C)

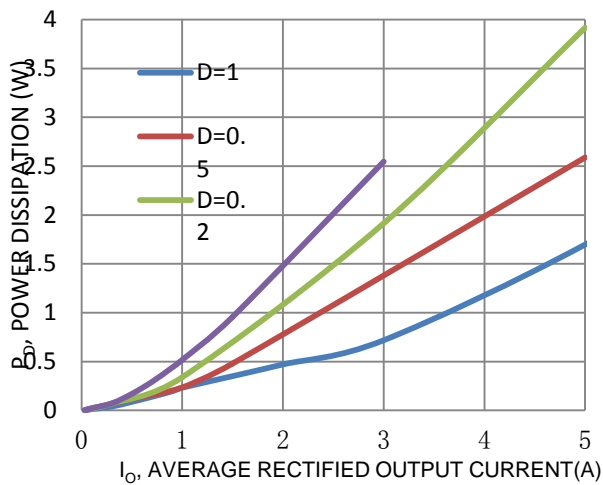


Figure 5. Forward Power Dissipation $T_J=125^\circ\text{C}$
(B520C - B540C)

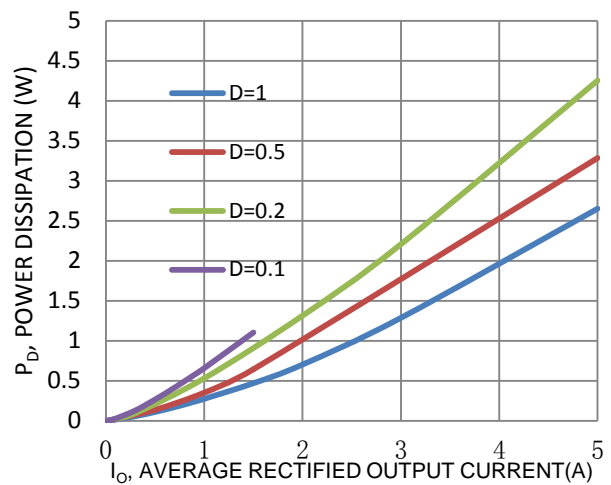


Figure 6. Forward Power Dissipation $T_J=125^\circ\text{C}$...
(B550C - B560C)

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

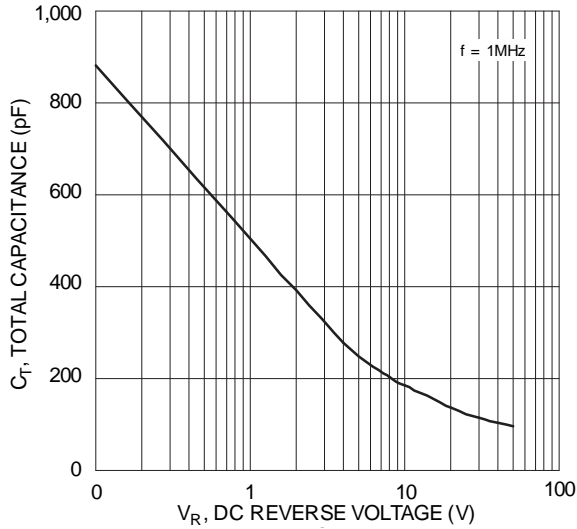


Figure 7 Total Capacitance vs. Reverse Voltage (B520C-B540C)

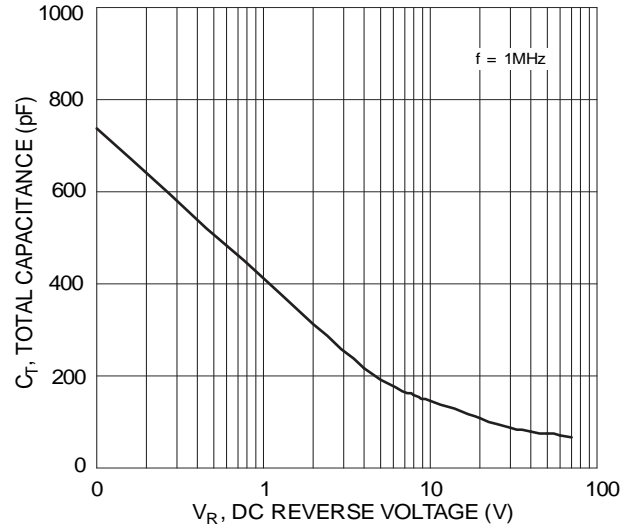


Figure 8 Total Capacitance vs. Reverse Voltage (B550C-B560C)

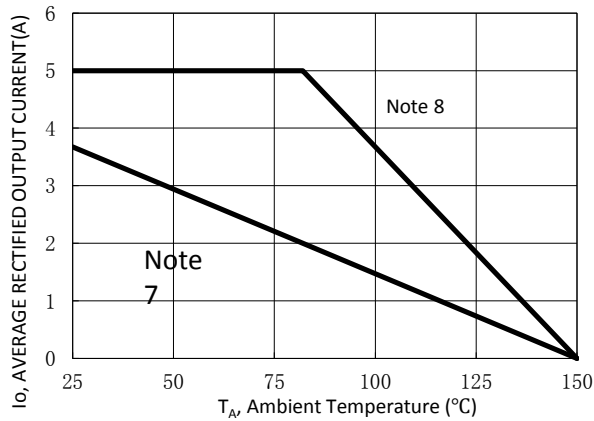


Figure 9. DC Forward Current Derating

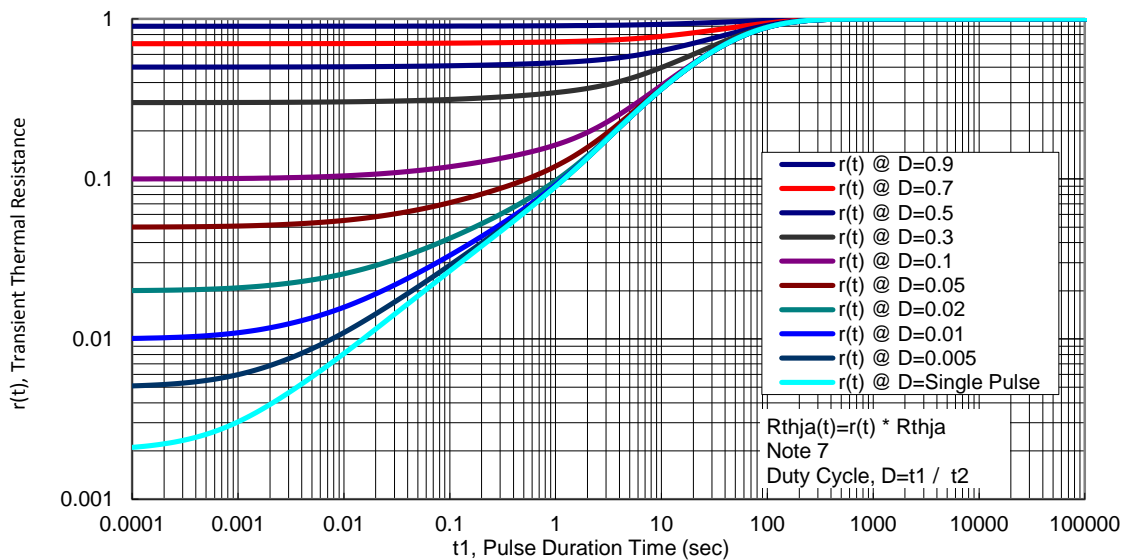
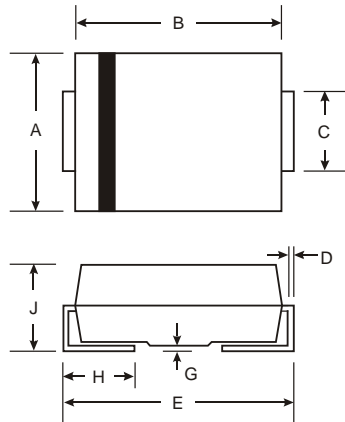


Figure 10 : Transient Thermal Resistance

Package Outline Dimensions

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

SMC

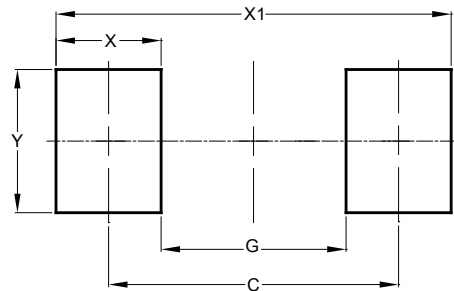


SMC		
Dim	Min	Max
A	5.59	6.22
B	6.60	7.11
C	2.75	3.18
D	0.15	0.31
E	7.75	8.13
G	0.10	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> 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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