CHANZON SR5100

CHANZON SR5100 (SB5100) Schottky Barrier Rectifier Diodes Instruction Manual

Model: SR5100

1. Introduction

This manual provides essential information for the proper use and handling of CHANZON SR5100 (SB5100) Schottky Barrier Rectifier Diodes. These diodes are designed for applications requiring high efficiency and low power loss, such as power supplies, inverters, and converters. Please read this manual thoroughly before installation and operation.

2. Product Overview and Features

The CHANZON SR5100 (SB5100) is a Schottky Barrier Rectifier diode with the following key characteristics:

- **Part Number:** SR5100 (SB5100)
- **Forward Current:** 5 Amperes (A)
- **Maximum Repetitive Peak Reverse Voltage:** 100 Volts (V)
- **Package Case:** DO-201AD (Axial, DO-27)
- Lead-Free and RoHS Compliant.
- Features high forward surge current capability.
- Designed for high temperature soldering.
- Offers low power loss and high efficiency.

Figure 1: CHANZON SR5100 Schottky Barrier Rectifier Diodes in their protective ESD bag.

3. Specifications

Detailed electrical and physical specifications for the SR5100 diode are provided below. For comprehensive datasheet information, refer to the manufacturer's official documentation.

Specification	Value
Part Number	SR5100
Forward Current (I_F)	5 A
Maximum Repetitive Peak Reverse Voltage (V_{RRM})	100 V
Package Case	DO-201AD (Axial)
Manufacturer	CHANZON

Specification	Value
Item Weight	Approximately 1.02 ounces (for 20 pieces)
Product Dimensions	6.69 x 5.12 x 0.59 inches (packaging)
Material	Other (Standard semiconductor materials)
Special Features	ESD Bag for protection and identification

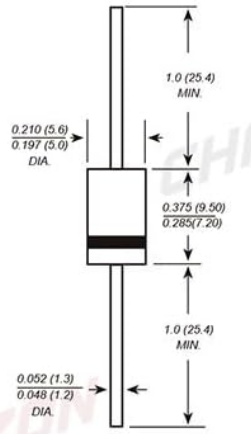
CHANZON

SR520 THRU SR5200

SCHOTTKY BARRIER RECTIFIER

Reverse Voltage - 20 to 200 Volts Forward Current -5.0 Amperes

DO-201AD



Dimensions in inches and (millimeters)

FEATURES

- The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
- Construction utilizes void-free molded plastic technique
- Low reverse leakage
- High forward surge current capability
- High temperature soldering guaranteed: 250℃/10 seconds,0.375″(9.5mm) lead length, 5 lbs. (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-201AD molded plastic body
Terminals: Plated axial leads, solderable per MIL-STD-750, Method 2026
Polarity: Color band denotes cathode end
Mounting Position: Any
Weight:0.04 ounce, 1.10 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25℃ ambient temperature unless otherwise specified.
Single phase half-wave 60Hz,resistive or inductive load,for capacitive load current derate by 20%.

MDD Catalog Number	SYMBOLS	SR 520	SR 530	SR 540	SR 550	SR 560	SR 570	SR 580	SR 590	SR 5A0	SR 5150	SR 5200	UNITS
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	70	80	90	100	150	200	VOLTS
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	49	56	63	70	105	140	VOLTS
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	70	80	90	100	150	200	VOLTS
Maximum average forward rectified current 0.375″(9.5mm) lead length(see fig.1)	$I_{(AV)}$	5.0											Amps
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0											Amps
Maximum instantaneous forward voltage at 5.0A	V_F	0.55			0.70		0.85					0.95	Volts
Maximum DC reverse current T_A=25℃	I_R	0.5										0.2	mA
at rated DC blocking voltage T_A=100℃		20.0					10.0					2.0	
Typical junction capacitance (NOTE 1)	C_J	500			400								pF
Typical thermal resistance (NOTE 2)	$R_{\theta JA}$	25.0											°C/W
Operating junction temperature range	T_J,	-65 to +125					-65 to +150						°C
Storage temperature range	T_{STG}	-65 to +150											°C

Note:1.Measured at 1MHz and applied reverse voltage of 4.0V D.C.
2.Thermal resistance from junction to ambient at 0.375″(9.5mm)lead length,P.C.B. mounted

Figure 2: Mechanical data and features for SR5100 series diodes, including DO-201AD package dimensions.

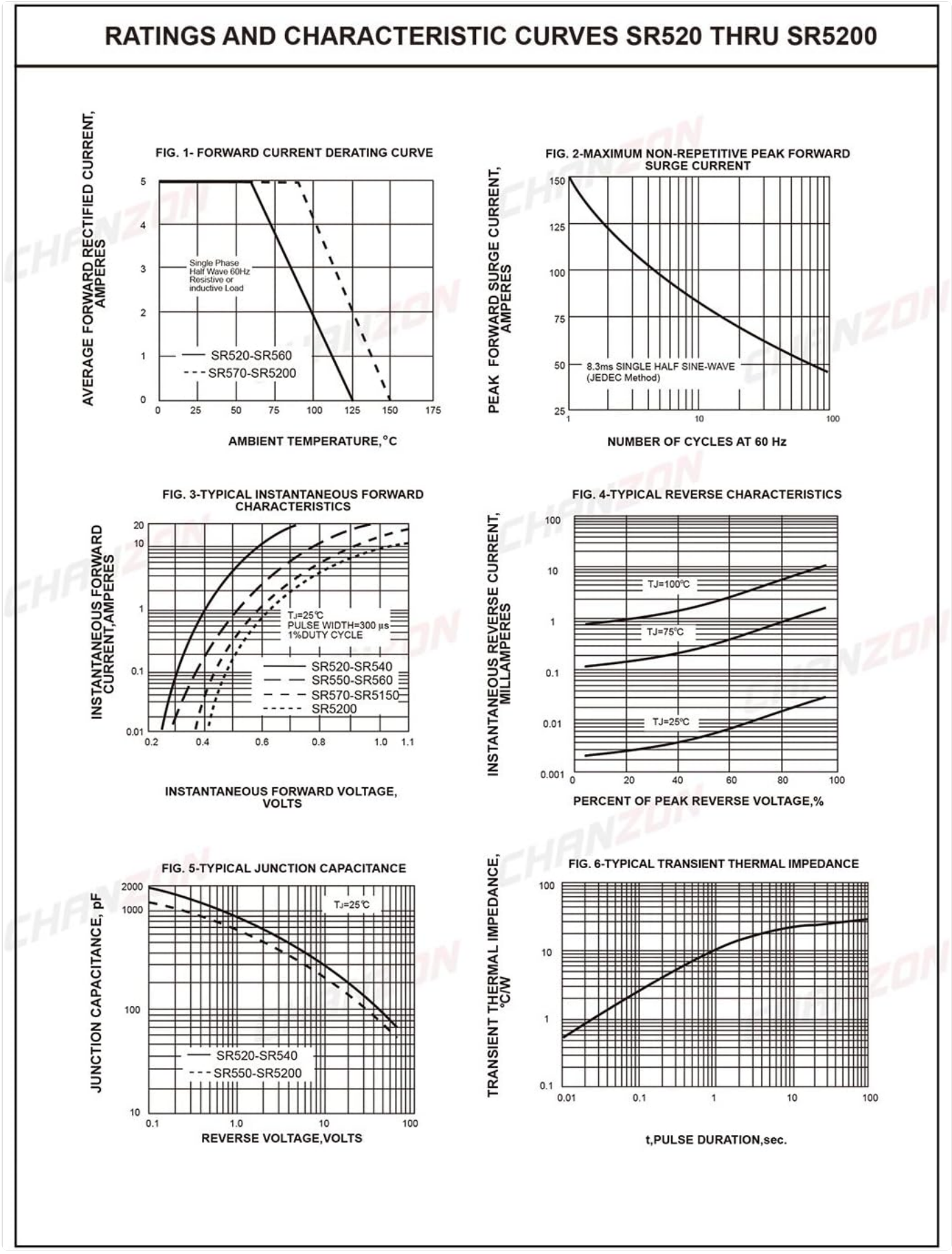


Figure 3: Ratings and characteristic curves for SR5100 series diodes, illustrating performance under various conditions.

4. Safety Information

When working with electronic components, always observe the following safety precautions:

- Ensure power is disconnected from the circuit before installing or removing components.
- Wear appropriate personal protective equipment, such as safety glasses.
- Handle components carefully to avoid physical damage or electrostatic discharge (ESD).
- Verify correct polarity before connecting the diode into a circuit. Incorrect polarity can lead to component failure or circuit damage.
- Do not exceed the maximum voltage and current ratings specified in the datasheet.

5. Setup and Installation

The SR5100 diodes are axial leaded components designed for through-hole mounting. Follow these general guidelines for installation:

1. **Identify Polarity:** The cathode end of the diode is typically indicated by a color band (e.g., silver or white band) on the diode body. The anode is the opposite end. Ensure correct polarity matching in your circuit design.
2. **Lead Forming:** Carefully bend the leads to fit the PCB holes, ensuring not to stress the diode body or the glass-to-metal seal.
3. **Mounting:** Insert the diode leads into the designated through-holes on the printed circuit board (PCB).
4. **Soldering:** Solder the leads to the PCB pads. The SR5100 is designed for high-temperature soldering. Follow standard soldering practices, ensuring good solder joints without overheating the component. The recommended soldering temperature and duration are typically 250°C for 10 seconds, 0.375 inches (9.5mm) from the lead body.
5. **Cleaning:** After soldering, clean any flux residue from the PCB.

The diodes are packaged in an ESD bag for protection. Always handle them in an ESD-safe environment to prevent damage from static electricity.

6. Operating Principles

Schottky barrier rectifiers like the SR5100 are semiconductor devices that allow current to flow in one direction with a very low forward voltage drop and fast switching speed. They are commonly used in:

- **Rectification:** Converting alternating current (AC) to direct current (DC).
- **Switching Power Supplies:** Due to their fast recovery time, they are ideal for high-frequency applications.
- **Voltage Clamping:** Protecting circuits from overvoltage.
- **Reverse Polarity Protection:** Preventing damage from incorrect power connections.

Ensure that the operating conditions (voltage, current, temperature) remain within the specified limits to ensure optimal performance and longevity of the diode.

7. Maintenance

Schottky diodes are passive components and generally require no active maintenance. However, proper handling and environmental conditions are crucial for their lifespan:

- **Storage:** Store unused diodes in their original ESD-protective packaging in a dry, cool environment to prevent moisture absorption and static damage.
- **Environmental Conditions:** Ensure the operating environment for the circuit containing the diodes is free from excessive moisture, dust, and corrosive substances.
- **Thermal Management:** Adequate heat dissipation is essential, especially in high-current applications. Ensure proper heatsinking if required by your circuit design to keep the junction temperature within specified limits.

8. Troubleshooting

If a diode-related issue arises in your circuit, consider the following:

- **No Current Flow / Open Circuit:**
  - Check for incorrect polarity.
  - Inspect solder joints for cold joints or bridges.
  - Verify the diode is not damaged (e.g., cracked body, broken leads).
- **Short Circuit / Excessive Current Flow:**
  - The diode may have failed due to overvoltage, overcurrent, or overheating.
  - Ensure the diode's ratings are appropriate for the application.
- **Overheating:**
  - Check if the forward current exceeds the diode's rating.
  - Ensure adequate heat dissipation (e.g., proper PCB layout, heatsink if necessary).
  - Verify ambient temperature is within operating limits.

Always use a multimeter to test diode functionality (forward voltage drop, reverse leakage) if you suspect a component failure.

9. Contact and Support

For further technical assistance or inquiries regarding CHANZON products, please refer to the official CHANZON website or contact their customer support. You can visit the CHANZON Store on Amazon for more information.