

# AD Series Solid State Relays

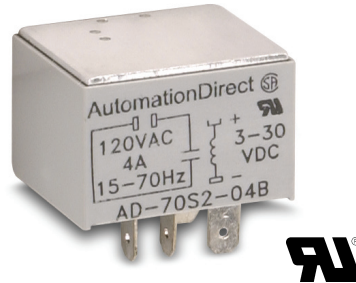
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AD-SSR210-22-DCZ

## Overview

A solid state relay is a relay with an isolated input and output, whose functions are achieved by using electronic components without the use of moving parts (vs. electromechanical relays).



AD-70S2-04B

### Operation

Solid state relays (SSR) are similar to electromechanical relays, in that both use a control circuit and a separate circuit for switching the load. When voltage is applied to the input of the SSR, the relay is energized by a light-emitting diode. The light from the diode is beamed into a light sensitive semiconductor which, in the case of zero voltage crossover relays, signals the control circuit to turn on the output of the solid state switch at the next zero voltage crossover.

## Features

Solid state relays have features which electromechanical relays do not, such as:

- Long life
- Shock and vibration resistant
- No generation of RFI, EMI
- No contact bounce
- Arcless switching
- No acoustic noise
- Zero crossing or random switching types
- IC compatibility
- Immunity to humidity, salt spray and dirt
- UL # E222847
- CSA # 2742910

### AD-SSR

- AC & DC input
- AC output
- 10 or 25 amp loads
- Photo isolated zero voltage switching
- 4000 Vrms isolation input to output
- Internal RC (snubber) network
- RFI suppression
- Integral safety cover and heatsink
- DIN-rail mounting or panel-mount

### AD-70S2

- DC input
- AC output
- Up to 4 amp loads
- Optically isolated
- Quick connect terminal, or panel mount when inserted into DIN-rail mountable socket

# AD Series Solid State Relay Selection Guide

Solid State Relays						
Part Number	Price	Drawing Links	Description	Switching Type	Derating Charts	
<a href="#"><u>AD-SSR210-22-ACZ</u></a>	\$46.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 90-280 VAC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.	Zero Cross		
<a href="#"><u>AD-SSR210-22-DCZ</u></a>	\$46.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 4-32 VDC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR230-22-ACZ</u></a>	\$69.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 90-280 VAC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR230-22-DCZ</u></a>	\$69.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 4-32 VDC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR610-22-ACZ</u></a>	\$49.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 90-280 VAC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR610-22-DCZ</u></a>	\$44.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 4-32 VDC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR630-22-ACZ</u></a>	\$69.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 90-280 VAC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR630-22-DCZ</u></a>	\$62.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 4-32 VDC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR210-22-ACR</u></a>	\$46.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 90-280 VAC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.	Random Switching	Figure 1	
<a href="#"><u>AD-SSR210-22-DCR</u></a>	\$46.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 4-32 VDC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR230-22-ACR</u></a>	\$52.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 90-280 VAC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR230-22-DCR</u></a>	\$52.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 4-32 VDC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR610-22-ACR</u></a>	\$46.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 90-280 VAC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR610-22-DCR</u></a>	\$46.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 10A contact rating. Coil voltage 4-32 VDC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR630-22-ACR</u></a>	\$57.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 90-280 VAC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR630-22-DCR</u></a>	\$57.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 30A contact rating. Coil voltage 4-32 VDC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR245-45-ACZ</u></a>	\$87.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 45A contact rating. Coil voltage 90-140 VAC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.	Zero Cross		
<a href="#"><u>AD-SSR245-45-DCZ</u></a>	\$86.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 45A contact rating. Coil voltage 3-32 VDC. Load voltage is 24-280 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR645-45-ACZ</u></a>	\$88.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 45A contact rating. Coil voltage 90-140 VAC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR645-45-DCZ</u></a>	\$88.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 45A contact rating. Coil voltage 3-32 VDC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR665-45-ACZ</u></a>	\$77.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 65A contact rating. Coil voltage 90-140 VAC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-SSR665-45-DCZ</u></a>	\$77.00	<a href="#"><u>PDF</u></a>	Solid state DIN-rail mount relay with 65A contact rating. Coil voltage 3-32 VDC. Load voltage is 48-660 VAC. Finger-safe design and LED status lamp. SPST normally open.			
<a href="#"><u>AD-70S2-04B*</u></a>	\$23.50	NA	Solid state plug-in relay with 4A contact rating. Coil voltage is 3-30 VDC. Load voltage is 24-140 VAC. SPST normally open.			Figure 2
<a href="#"><u>AD-70S2-04C*</u></a>	\$23.50	NA	Solid state plug-in relay with 4A contact rating. Coil voltage is 3-30 VDC. Load voltage is 24-280 VAC. SPST normally open.			
<a href="#"><u>AD-70S2-04D*</u></a>	\$23.50	NA	Solid state plug-in relay with 4A contact rating. Coil voltage is 3-30 VDC. Load voltage is 8-50 VAC. SPST normally open.			

\*NOTE: See 78 Series Relays Socket dimensions.

# AD Series Solid State Relay Specifications

Specifications										
Part Number	AD-SSR245-45-DCZ	AD-SSR210-22-DCZ	AD-SSR230-22-DCZ	AD-SSR210-22-DCR	AD-SSR230-22-DCR	AD-SSR610-22-DCZ	AD-SSR630-22-DCZ	AD-SSR645-45-DCZ	AD-SSR665-45-DCZ	AD-SSR610-22-DCR
<b>Input Characteristics</b>										
<b>Control Voltage Range</b>	3-32 VDC	4-32 VDC				90-280 VAC		90-140 VAC	90-280 VAC	90-140 VAC
<b>Typical Input Current</b>	8-12 mA				2-4 mA					
<b>Max. Turn-On Voltage</b>	4VDC				90 Vrms					
<b>Min. Turn-Off Voltage</b>	1VDC				10 Vrms					
<b>Output Characteristics</b>										
<b>Output Type</b>	SCR									
<b>Switching Type</b>	Zero Cross	Random Switching	Zero Cross	Random Switching	Zero Cross	Random Switching	Zero Cross	Random Switching	Zero Cross	
<b>Output Voltage</b>	24-280 VAC		48-660 VAC		24-280 VAC		48-660 VAC		24-280 VAC	48-660 VAC
<b>Load Current Range</b>	10-45A		65A	10-45A				65A		
<b>Transient Over-Voltage</b>	600Vpk		1200Vpk		600Vpk		1200Vpk		600Vpk	1200Vpk
<b>Max. Surge Current</b>	10A: 120Apk; 30/45A: 625Apk; (at 16.6 ms)		625Apk (at 16.6 ms)		10A: 120Apk; 30/45A: 625Apk; (at 16.6 ms)		625Apk (at 16.6 ms)		10A: 120Apk; 30/45A: 625Apk; (at 16.6 ms)	625Apk (at 16.6 ms)
<b>Max. On-State Voltage Drop at Rated Current</b>	1.6 Vpk									
<b>Max. I<sup>2</sup>T for Fusing (8.3 ms)</b>	10A: 60 A2sec; 20A: 260 A2sec; 30/45A: 1620 A2sec		1620 A2sec		10A: 60 A2sec; 20A: 260 A2sec; 30/45A: 1620 A2sec		1620 A2sec		10A: 60 A2sec; 20A: 260 A2sec; 30/45A: 1620 A2sec	1620 A2sec
<b>Max. Off-State Leakage Current at Rated Current</b>	10mA		1mA		10mA		1mA		10mA	1mA
<b>Max. Rate of Rise Off State Voltage (dv/dt)</b>	500 V/us									
<b>Max Response Time (On and Off)</b>	1/2 cycle									
<b>General Characteristics</b>										
<b>Electrical Life</b>	N/A for solid state relays									
<b>Operating Temperature Range</b>	-40 to 80°C [-40 to 176°F] - derating applies									
<b>Storage Temperature Range</b>	-40 to 125°C [-40 to 257°F]									
<b>Frequency</b>	Input: no frequency limitation / output: snubber 48-63 Hz									
<b>Weight</b>	10/20/30 A: 272g [9.6 oz]; 45A: 482g [17oz]									
<b>Input Indication</b>	Green LED									
<b>Encapsulation</b>	Thermally conductive epoxy									
<b>Input Terminal Screw Torque</b>	10/20/30 A: 5.0-6.0 in·lb [0.6-0.7 N·m]; 45A: 5.0-6.0 in·lb [0.6-0.7 N·m]									
<b>Output Terminal Screw Torque</b>	10/20/30 A: 5.0-6.0 in·lb [0.6-0.7 N·m]; 45A: 10.0-15.0 in·lb [1.1-1.7 N·m]									
<b>Mount Type</b>	35mm DIN rail and panel mount									
<b>Max. Wire Size</b>	8AWG									
<b>Agency Approvals *</b>	E222847 UL Recognized, CE, CSA 2742910									

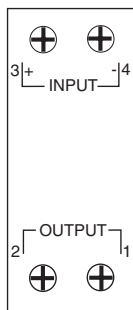
\* To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.

# AD Series Solid State Relay Specifications

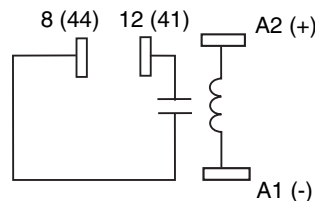
Specifications			
Part Number	<u>AD-70S2-04B</u>	<u>AD-70S2-04C</u>	<u>AD-70S2-04D</u>
<b>Input Characteristics</b>			
Input Voltage Range	3 - 30 VDC		
Must Release Voltage	5VDC		
Typical Input Current	1 - 17 mA	1 - 6 mA	1 - 17 mA
Maximum Reverse Control Voltage	5VDC		
<b>Output Characteristics</b>			
Contact Rating	4A		
Contact Configuration	SPST-N.O.		
Output Voltage Range	24 - 140 VAC	24 - 280 VAC	8 - 50 VAC
Switching Type	Zero Cross		
Switching Device	Triac		
Maximum Rate of Rise Off State Voltage (dv/dt)	300 V/us		
Min. Load Current to Maintain On	75mA		
Non-Repetitive Surge Current (1 cycle)	60A		
Max. Off State Leakage Current (rms)	6mA	6mA	10mA
Minimum Peak Blocking Voltage	400VAC	600VAC	200VAC
Typical On State Voltage Drop (rms)	1.6 VAC		
<b>General Characteristics</b>			
Mounting Type	Socket Mount		
Thermal Resistance (Junction to Case)	4 °C/W		
Dielectric Strength, Terminals to Chassis	3000 VAC		
Ambient Air Temperature around the Device - Storage	-40 to +125 °C		
Ambient Air Temperature around the Device - Operation	-40 to +100 °C		
Agency Approvals	UL (E258297), CSA (040787), RoHs		

## Wiring Diagrams

**Figure 1**  
AD-SSRxxx-xx wiring diagram



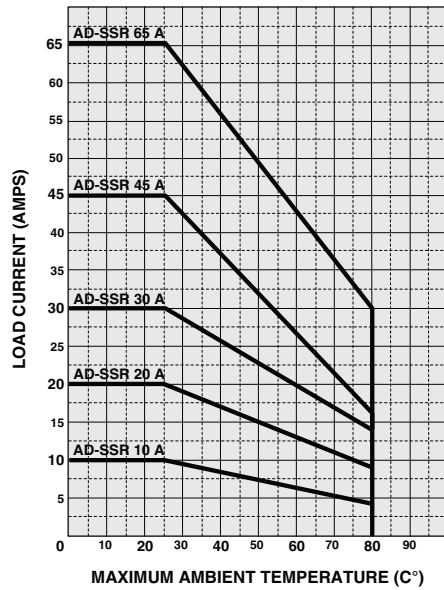
**Figure 2**  
AD-70S2-xx wiring diagram



# SSR Series Derating Charts

## Derating Charts

AD-SSR Series derating chart



AD-70S2 Series derating charts  
Maximum Continuous Current vs. Ambient Temperature

