

# AD Series Class 6 Solid State Relays

## Overview

The Class 6 solid state relays offer an energy-efficient alternative to standard electromechanical relays.

Switching types include DC switching for low-voltage DC loads and Zero Cross for resistive AC loads where the output energizes/de-energizes when control voltage is near zero.

Switching devices include: MOSFET for DC loads, Triac and SCR for AC loads.

## Features

- Finger-safe "Hockey Puck" housing
- Solid-state circuitry
- High load ratings up to 75 amps
- Input indicating LED
- Optically coupled circuits
- Panel mount
- Thermal pad included with each relay



**AD-SSR610-AC-280A**

Class 6 Solid State Relays							
Part Number	Price	Drawing Links	Type	Input Voltage	Load Voltage	Configuration	Contact Rating
<a href="#"><u>AD-SSR610-AC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC	24 to 280 VAC	SPST	10A
<a href="#"><u>AD-SSR610-DC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6T10-DC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. TRIAC	3 to 32 VDC			
<a href="#"><u>AD-SSR625-AC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR625-DC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6T25-DC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. TRIAC	3 to 32 VDC			
<a href="#"><u>AD-SSR640-AC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR640-DC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6T40-DC-280A</u></a>	Retired	<a href="#">PDF</a>	N.O. TRIAC	3 to 32 VDC			
<a href="#"><u>AD-SSR650-AC-280A</u></a>	\$35.50	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR650-DC-280A</u></a>	\$35.50	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR675-AC-280A</u></a>	\$48.50	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR675-DC-280A</u></a>	\$48.50	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6M12-DC-200D</u></a>	Retired	<a href="#">PDF</a>	N.O. MOSFET	3.5 to 32 VDC			3 to 200 VDC
<a href="#"><u>AD-SSR6M25-DC-200D</u></a>	Retired	<a href="#">PDF</a>	N.O. MOSFET	3.5 to 32 VDC	25A		
<a href="#"><u>AD-SSR6M40-DC-200D</u></a>	Retired	<a href="#">PDF</a>	N.O. MOSFET	3.5 to 32 VDC	40A		
<a href="#"><u>AD-SSR610-AC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC	48 to 480 VAC	SPST	10A
<a href="#"><u>AD-SSR610-DC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6T10-DC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. TRIAC	3 to 32 VDC			
<a href="#"><u>AD-SSR625-AC-480A</u></a>	\$22.00	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR625-DC-480A</u></a>	\$21.00	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6T25-DC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. TRIAC	3 to 32 VDC			
<a href="#"><u>AD-SSR640-AC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR640-DC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			
<a href="#"><u>AD-SSR6T40-DC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. TRIAC	3 to 32 VDC			
<a href="#"><u>AD-SSR640-AC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	90 to 280 VAC			
<a href="#"><u>AD-SSR640-DC-480A</u></a>	Retired	<a href="#">PDF</a>	N.O. SCR	3 to 32 VDC			

Note: Thermal pad included with each relay.

# AD Series Class 6 Solid State Relays

Specifications						
Part Number	AD-SSR610-AC-280A	AD-SSR610-DC-280A	AD-SSR6T10-DC-280A	AD-SSR625-AC-280A	AD-SSR625-DC-280A	AD-SSR6T25-DC-280A
<b>Input Characteristics</b>						
<b>Control Voltage Range</b>	90 to 280 VAC	3 to 32 VDC		90 to 280 VAC	3 to 32 VDC	
<b>Typical Input Current</b>	20mA @240VAC 11mA @120VAC	16mA	2mA	20mA @240VAC 11mA @120VAC	16mA	2mA
<b>Must Release Voltage</b>	10VAC	1VDC		10VAC	1VDC	
<b>Reverse Polarity Protection</b>	-	yes	yes	-	yes	yes
<b>Switching Type</b>	Zero Cross					
<b>Power Indicator</b>	Green LED status lamp					
<b>Output Characteristics</b>						
<b>Load Voltage Range</b>	24 to 280 VAC					
<b>Rated Load Current</b>	10A			25A		
<b>Maximum Off-State Voltage dv/dt</b>	200V/μs	200V/μs	250V/μs	500V/μs	500V/μs	250V/μs
<b>Minimum Load Current</b>	50mA	50mA	50mA	120mA	120mA	120mA
<b>Maximum Non-Repetitive Surge Current (1 Cycle, 16.6 ms), peak</b>	83A	83A	100A	250A		
<b>Maximum Off State Leakage current (RMS)</b>	8mA	10mA	10mA	8mA	10mA	10mA
<b>Maximum On-State Voltage Drop (RMS)</b>	1.6 V rms					
<b>Maximum I<sup>2</sup>T for Fusing (A2Sec)</b>	72	83	52	312	250	300
<b>Operating Frequency Range</b>	50 to 60 Hz					
<b>Maximum Turn-On Time</b>	1/2 cycle					
<b>Maximum Turn-Off Time</b>	1/2 cycle					
<b>General Characteristics</b>						
<b>Dielectric Strength (Input-to-Output Isolation)</b>	4000VAC (rms)					
<b>Thermal Resistance (Junction to Base)</b>	3.5°C/W (6.3°F/W)		2.1°C/W (3.78°F/W)	1.02°C/W (1.836°F/W)		1.45°C/W (2.61°F/W)
<b>Minimum Insulation Resistance @ 500 VDC</b>	1 <sup>E</sup> + 10Ω					
<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>Weight</b>	100g [3.53 oz]					
<b>Terminal Screw Size</b>	Input: M3.5 Output: M4					
<b>Terminal Torque</b>	Input terminals: 10 lb·in Output terminals: 20 lb·in					
<b>Terminal Wire Capacity</b>	Inputs up to 12AWG / Outputs up to 10AWG. For anything larger, fork or ring terminals are recommended.					
<b>Agency Approvals</b>	UL file # E222847 CE, CSA, RoHS					

# AD Series Class 6 Solid State Relays

Specifications							
Part Number	AD-SSR640-AC-280A	AD-SSR640-DC-280A	AD-SSR6740-DC-280A	AD-SSR650-AC-280A	AD-SSR650-DC-280A	AD-SSR675-AC-280A	AD-SSR675-DC-280A
<b>Input Characteristics</b>							
<b>Control Voltage Range</b>	90 to 280 VAC	3 to 32 VDC		90 to 280 VAC	3 to 32 VDC	90 to 280 VAC	3 to 32 VDC
<b>Typical Input Current</b>	20mA @240VAC 11mA @120VAC	16mA	2mA	4mA @240VAC 2mA @120VAC	10mA	4mA @240VAC 2mA @120VAC	10mA
<b>Must Release Voltage</b>	10VAC	1VDC		10VAC	1VDC	10VAC	1VDC
<b>Reverse Polarity Protection</b>	-	yes	yes	-	yes	-	yes
<b>Switching Type</b>	Zero Cross						
<b>Power Indicator</b>	Green LED status lamp						
<b>Output Characteristics</b>							
<b>Load Voltage Range</b>	24 to 280 VAC						
<b>Rated Load Current</b>	40A		50A		75A		
<b>Maximum Off-State Voltage dv/dt</b>	500V/μs	500V/μs	250V/μs	500V/μs	500V/μs	500V/μs	500V/μs
<b>Minimum Load Current</b>	250mA	250mA	50mA	40mA	150mA	40mA	250mA
<b>Maximum Non-Repetitive Surge Current (1 Cycle, 16.6 ms), peak</b>	625A	625A	250A	625A	625A	1000A	1000A
<b>Maximum Off State Leakage current (RMS)</b>	10mA	10mA	10mA	10mA	1mA	10mA	1mA
<b>Maximum On-State Voltage Drop (RMS)</b>	1.6 V rms						
<b>Maximum I<sup>2</sup>T for Fusing (A<sup>2</sup>Sec)</b>	1250	625	488	1620	1620	4150	4150
<b>Operating Frequency Range</b>	50 to 60 Hz						
<b>Maximum Turn-On Time</b>	1/2 cycle		10ms		1/2 cycle	10ms	1/2 cycle
<b>Maximum Turn-Off Time</b>	1/2 cycle		40ms		1/2 cycle	40ms	1/2 cycle
<b>General Characteristics</b>							
<b>Dielectric Strength (Input-to-Output Isolation)</b>	4000VAC (rms)						
<b>Thermal Resistance (Junction to Base)</b>	0.9°C/W (1.62°F/W)		0.95°C/W (1.71°F/W)	0.63°C/W (1.134°F/W)		0.31°C/W (0.558°F)	
<b>Minimum Insulation Resistance @ 500 VDC</b>	1 <sup>E</sup> + 10Ω			1 <sup>E</sup> + 9Ω			
<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>Weight</b>	100g [3.53 oz]						
<b>Terminal Screw Size</b>	Input: M3.5 Output: M4						
<b>Terminal Torque</b>	Input terminals: 10 lb-in Output terminals: 20 lb-in						
<b>Terminal Wire Capacity</b>	Inputs up to 12AWG / Outputs up to 10AWG. For anything larger, fork or ring terminals are recommended.						
<b>Agency Approvals</b>	UL file # E222847 CE, CSA, RoHS						

# AD Series Class 6 Solid State Relays

Specifications						
Part Number	AD-SSR6M12-DC-200D	AD-SSR6M25-DC-200D	AD-SSR6M40-DC-200D	AD-SSR610-AC-480A	AD-SSR610-DC-480A	AD-SSR6T10-DC-480A
<b>Input Characteristics</b>						
Control Voltage Range	3.5 to 32 VDC			90 to 280 VAC	3 to 32 VDC	
Typical Input Current	10mA			20mA @240VAC 11mA @120VAC	16mA	
Must Release Voltage	1VDC			10VAC	1VDC	
Reverse Polarity Protection	no			-	no	
Switching Type	DC			Zero Cross		
Power Indicator	Green LED status lamp					
<b>Output Characteristics</b>						
Load Voltage Range	3 to 200 VDC			48 to 480 VAC		
Rated Load Current	12A	25A	40A	10A		
Maximum Off-State Voltage dv/dt	-			200V/μs		
Minimum Load Current	20mA			50mA	150mA	50mA
Maximum Non-Repetitive Surge Current (1 Cycle, 16.6 ms), peak	27A	50A	90A	83A	83A	100A
Maximum Off State Leakage current (RMS)	8mA			10mA	8mA	8mA
Typical On-State Voltage Drop (RMS)	2.8 VDC (@ 40A load)			1.7 V rms	1.6 V rms	1.6 V rms
Maximum I <sup>2</sup> T for Fusing (A <sup>2</sup> Sec)	-			72	72	35
Operating Frequency Range	-			50 to 60 Hz		
Maximum Turn-On Time	300μs	600μs	600μs	1/2 cycle	8.3 ms	1/2 cycle
Maximum Turn-Off Time	1ms			1/2 cycle	8.3 ms	1/2 cycle
<b>General Characteristics</b>						
Dielectric Strength (Input-to-Output Isolation)	2500VAC (rms)			4000VAC (rms)		
Thermal Resistance (Junction to Base)	1.03°C/W (1.854°F/W)	1.06°C/W (1.908°F/W)		3°C/W (5.4°F/W)		2.9°C/W (5.22°F/W)
Minimum Insulation Resistance @ 500 VDC	1 <sup>E</sup> + 10Ω					
Operating Temperature Range	-40 to 80°C [-40 to 176°F] (derating applies)					
Storage Temperature Range	-40 to 100°C [-40 to 212°F]			-40 to 100°C [-40 to 212°F]		
Weight	110g [3.88 oz]	135g [4.76 oz]	135g [4.76 oz]	100g [3.53 oz]		
Terminal Screw Size	Input: M3.5 Output: M4					
Terminal Torque	Input terminals: 10 lb·in. Output terminals: 20 lb·in					
Terminal Wire Capacity	Inputs up to 12AWG / Outputs up to 10AWG. For anything larger, fork or ring terminals are recommended.					
Agency Approvals	UL file # E222847, CE, CSA, RoHS					

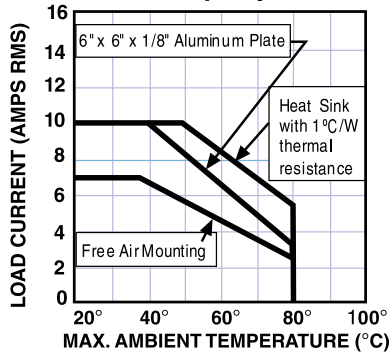
# AD Series Class 6 Solid State Relays

Specifications						
Part Number	AD-SSR625-AC-480A	AD-SSR625-DC-480A	AD-SSR625-DC-480A	AD-SSR640-AC-480A	AD-SSR640-DC-480A	AD-SSR640-DC-480A
<b>Input Characteristics</b>						
<b>Control Voltage Range</b>	90 to 280 VAC	3 to 32 VDC		90 to 280 VAC	3 to 32 VDC	
<b>Typical Input Current</b>	20mA @240VAC 11mA @120VAC	16mA		20mA @240VAC 11mA @120VAC	16mA	
<b>Must Release Voltage</b>	10VAC	1VDC		10VAC	1VDC	
<b>Reverse Polarity Protection</b>	-	no		-	no	
<b>Switching Type</b>	Zero Cross					
<b>Power Indicator</b>	Green LED status lamp					
<b>Output Characteristics</b>						
<b>Load Voltage Range</b>	48 to 480 VAC					
<b>Rated Load Current</b>	25A			40A		
<b>Maximum Off-State Voltage dv/dt</b>	300V/μs	500V/μs	250V/μs	500V/μs	500V/μs	250V/μs
<b>Minimum Load Current</b>	120mA	120mA	20mA	250mA	250mA	250mA
<b>Maximum Non-Repetitive Surge Current (1 Cycle, 16.6 ms), peak</b>	250A	250A	250A	625A	625A	300A
<b>Maximum Off State Leakage current (RMS)</b>	10mA	8mA	8mA	10mA	8mA	8mA
<b>Typical On-State Voltage Drop (RMS)</b>	1.7 V rms	1.6 V rms	1.6 V rms	1.7 V rms	1.6 V rms	1.6 V rms
<b>Maximum I2T for Fusing (A2Sec)</b>	312	312	200	1250	1250	250
<b>Operating Frequency Range</b>	50/60 Hz					
<b>Maximum Turn-On Time</b>	8.3 ms	1/2 cycle	1/2 cycle	1/2 cycle	1/2 cycle	1/2 cycle
<b>Maximum Turn-Off Time</b>	8.3 ms	1/2 cycle	1/2 cycle	1/2 cycle	1/2 cycle	1/2 cycle
<b>General Characteristics</b>						
<b>Dielectric Strength (Input-to-Output Isolation)</b>	4000VAC (rms)					
<b>Thermal Resistance (Junction to Base)</b>	1.02°C/W (1.836°F/W)		1.2°C/W (2.16°F/W)	0.9°C/W (1.62°F/W)		0.95°C/W (1.71°F/W)
<b>Minimum Insulation Resistance @ 500 VDC</b>	1 <sup>E</sup> + 10Ω					
<b>Operating Temperature Range</b>	-40 to 80°C [-40 to 176°F] (derating applies)					
<b>Storage Temperature Range</b>	-40 to 100°C [-40 to 212°F]					
<b>Weight</b>	100g [3.53 oz]					
<b>Terminal Screw Size</b>	Input: M3.5 Output: M4					
<b>Terminal Torque</b>	Input terminals: 10 lb-in. Output terminals: 20 lb-in					
<b>Terminal Wire Capacity</b>	Inputs up to 12AWG / Outputs up to 10AWG. For anything larger, fork or ring terminals are recommended.					
<b>Agency Approvals</b>	UL file # E222847, CE, CSA, RoHS					

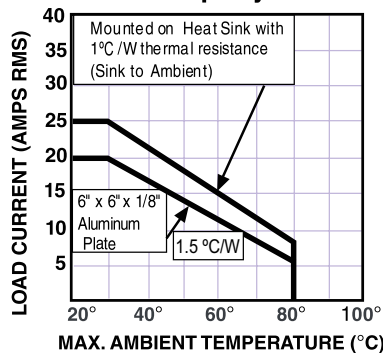
# AD Series Class 6 Solid State Relays Derating Charts

## Derating Charts

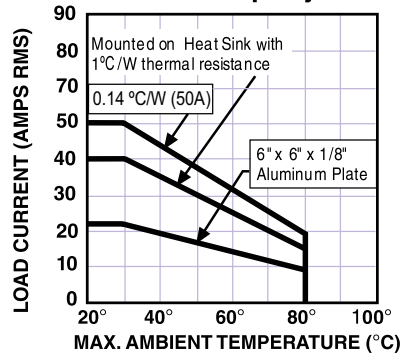
**10 Amp Styles**



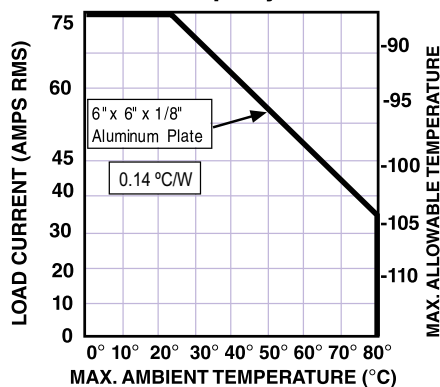
**25 Amp Styles**



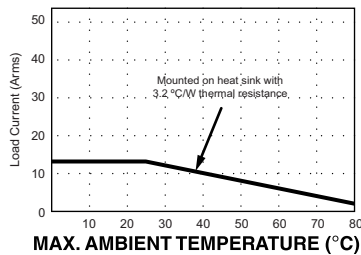
**40 & 50 Amp Styles**



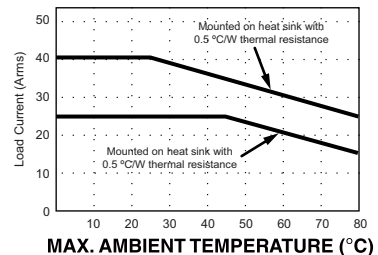
**75 Amp Styles**



**12 A MOSFET**



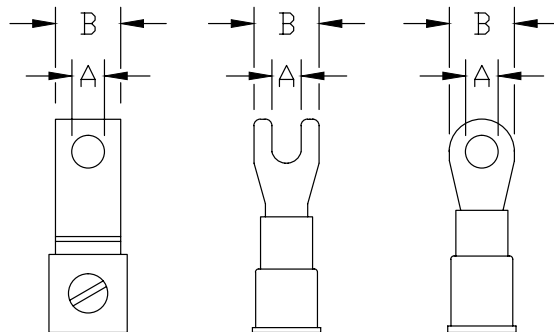
**25/40 A MOSFET**



Note: Charts are based on using a thermal transfer medium such as the included thermal pad

# AD Series Class 6 Solid State Relays Accessory

Accessory for SSR6 Solid State Relay			
Part Number	Price	Description	Drawing Link
<a href="#"><u>AD-SSR-THERM-PAD</u></a>	Retired	AutomationDirect thermal mounting pad, package of 10. For use with solid state relays starting with AD-SSR6.	<a href="#"><u>PDF</u></a>



FORK/SPADE SIZES			
RELAY TERMINAL	A		B
	MIN.	MAX.	MAX.
INPUT SIDE	3.5 [0.14]	5.0 [0.20]	10.0 [0.39]
OUTPUT SIDE	4.2 [0.16]	6.4 [0.25]	10.0 [0.39]