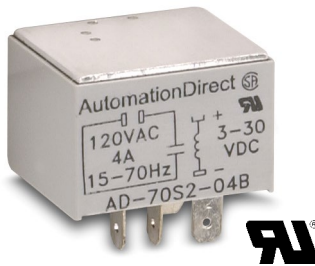


# AD Series Solid State Relays



**AD-SSR210-22-DCZ shown**

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 shown**

## 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.

## Solid State Relay 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 Features

- 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 Features

- 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 Relay Selection Guide											
Part Number	Price	Description	Switching Type	Dimensions & Derating Charts	Relay Socket Part Number	Price	Socket Dimensions				
<b>AD-SSR210-22-ACZ</b>	\$39.00	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	Figure 1	N/A	N/A	N/A				
<b>AD-SSR210-22-DCZ</b>	\$39.00	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.									
<b>AD-SSR230-22-ACZ</b>	\$59.00	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.									
<b>AD-SSR230-22-DCZ</b>	\$59.00	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.									
<b>AD-SSR610-22-ACZ</b>	\$41.25	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.									
<b>AD-SSR610-22-DCZ</b>	\$37.50	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.									
<b>AD-SSR630-22-ACZ</b>	\$58.50	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.									
<b>AD-SSR630-22-DCZ</b>	\$54.00	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.									
<b>AD-SSR210-22-ACR</b>	\$39.00	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	N/A	N/A	N/A				
<b>AD-SSR210-22-DCR</b>	\$39.00	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.									
<b>AD-SSR230-22-ACR</b>	\$45.00	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.									
<b>AD-SSR230-22-DCR</b>	\$45.00	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.									
<b>AD-SSR610-22-ACR</b>	\$39.00	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.									
<b>AD-SSR610-22-DCR</b>	\$39.00	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.									
<b>AD-SSR630-22-ACR</b>	\$49.00	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.									
<b>AD-SSR630-22-DCR</b>	\$49.00	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.									
<b>AD-SSR245-45-ACZ</b>	\$73.75	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	Figure 2	N/A	N/A	N/A				
<b>AD-SSR245-45-DCZ</b>	\$73.25	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.									
<b>AD-SSR645-45-ACZ</b>	\$75.00	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.									
<b>AD-SSR645-45-DCZ</b>	\$75.00	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.									
<b>AD-SSR665-45-ACZ</b>	\$65.00	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.									
<b>AD-SSR665-45-DCZ</b>	\$65.00	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.									
<b>AD-70S2-04B</b>	\$20.00	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 3	782-2C-SKT (see wiring diagram on next page)	\$4.00	Figure 6 *
<b>AD-70S2-04C</b>	\$20.00	Solid state plug-in relay with 4A contact rating. Coil voltage is 3-30 VDC. Load voltage is 24-280 VAC. SPST normally open.									
<b>AD-70S2-04D</b>	\$20.00	Solid state plug-in relay with 4A contact rating. Coil voltage is 3-30 VDC. Load voltage is 8-50 VAC. SPST normally open.									

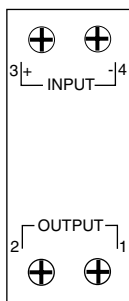
\*NOTE: See 78 Series Relays Socket dimensions.

# AD Series Solid State Relay Specifications

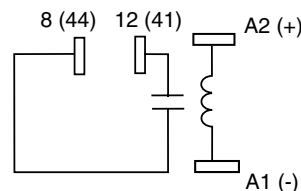
Specifications																						
Part Number	AD-SSR245-45-DCZ	AD-SSR210-22-DCZ	AD-SSR230-22-DCZ	AD-SSR210-22-DCR	AD-SSR230-22-DCR	AD-SSR610-22-DCZ	AD-SSR630-22-DCZ	AD-SSR645-45-DCZ	AD-SSR665-45-DCZ	AD-SSR610-22-DCR	AD-SSR630-22-DCR	AD-SSR210-22-ACZ	AD-SSR230-22-ACZ	AD-SSR210-22-ACR	AD-SSR230-22-ACR	AD-SSR610-22-ACZ	AD-SSR630-22-ACZ	AD-SSR645-45-ACZ	AD-SSR610-22-ACR	AD-SSR630-22-ACR	AD-SSR245-45-ACZ	AD-SSR665-45-ACZ
<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>Maximum Turn-On Voltage</b>	4VDC										90 Vrms											
<b>Minimum 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	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		65A							
<b>Load Current Range</b>	10-45A																					
<b>Transient Over-Voltage</b>	600Vpk		1200Vpk			600Vpk		1200Vpk			600Vpk		1200Vpk		600Vpk		1200Vpk					
<b>Maximum 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)		10A: 120Apk; 30/45A: 625Apk; (at 16.6 ms)		625Apk (at 16.6 ms)					
<b>Maximum On-State Voltage Drop at Rated Current</b>	1.6 Vpk																					
<b>Maximum I<sup>2</sup>T for Fusing (8.3 ms)</b>	10A: 60 A <sup>2</sup> sec; 20A: 260 A <sup>2</sup> sec; 30/45A: 1620 A <sup>2</sup> sec		1620 A <sup>2</sup> sec			10A: 60 A <sup>2</sup> sec; 20A: 260 A <sup>2</sup> sec; 30/45A: 1620 A <sup>2</sup> sec		1620 A <sup>2</sup> sec			10A: 60 A <sup>2</sup> sec; 20A: 260 A <sup>2</sup> sec; 30/45A: 1620 A <sup>2</sup> sec		1620 A <sup>2</sup> sec		10A: 60 A <sup>2</sup> sec; 20A: 260 A <sup>2</sup> sec; 30/45A: 1620 A <sup>2</sup> sec		1620 A <sup>2</sup> sec					
<b>Maximum Off-State Leakage Current at Rated Current</b>	10mA		1mA			10mA		1mA			10mA		1mA		10mA		1mA					
<b>Maximum 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°C to 80°C (-40°F to 176°F) - derating applies																					
<b>Frequency</b>	Input: no frequency limitation / output: snubber 48-63 Hz																					
<b>Storage Temperature Range</b>	-40°C to 125°C (-40°F to 257°F)																					
<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>Maximum 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 Approval Checklist section on the specific part number's web page at [www.AutomationDirect.com](http://www.AutomationDirect.com)

AD-SSRxxx-xx wiring diagram



AD-70S2-xx wiring diagram



Please see our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.

# AD Series Solid State Relay Specifications

<b>Specifications</b>			
<b>Part Number</b>	<b>AD-70S2-04B</b>	<b>AD-70S2-04C</b>	<b>AD-70S2-04D</b>
<b>Input Characteristics</b>			
<b>Input Voltage Range</b>	3 - 30 VDC		
<b>Must Release Voltage</b>	5VDC		
<b>Typical Input Current</b>	1 - 17 mA	1 - 6 mA	1 - 17 mA
<b>Maximum Reverse Control Voltage</b>	5VDC		
<b>Output Characteristics</b>			
<b>Contact Rating</b>	4A		
<b>Contact Configuration</b>	SPST-NO		
<b>Output Voltage Range</b>	24 - 140 VAC	24 - 280 VAC	8 - 50 VAC
<b>Switching Type</b>	Zero Cross		
<b>Switching Device</b>	Triac		
<b>Maximum Rate of Rise Off State Voltage (dv/dt)</b>	300 V/us		
<b>Min. Load Current to Maintain On</b>	75mA		
<b>Non-Repetitive Surge Current (1 cycle)</b>	60A		
<b>Max. Off State Leakage Current (rms)</b>	6mA	6mA	10mA
<b>Minimum Peak Blocking Voltage</b>	400VAC	600VAC	200VAC
<b>Typical On State Voltage Drop (rms)</b>	1.6 VAC		
<b>General Characteristics</b>			
<b>Mounting Type</b>	Socket Mount		
<b>Thermal Resistance (Junction to Case)</b>	4 °C/W		
<b>Dielectric Strength, Terminals to Chassis</b>	3000 VAC		
<b>Ambient Air Temperature around the Device - Storage</b>	-40 to +125 °C		
<b>Ambient Air Temperature around the Device - Operation</b>	-40 to +100 °C		
<b>Agency Approvals</b>	UL (E258297), CSA (040787), RoHs		

# SSR Series Dimensions & Derating Charts

## Dimensions

inches [mm]

### AD-SSR Series

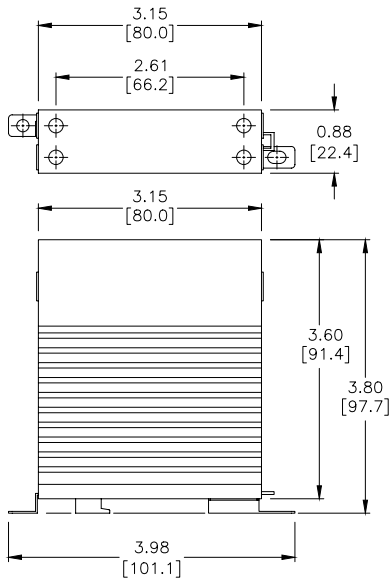


Figure 1

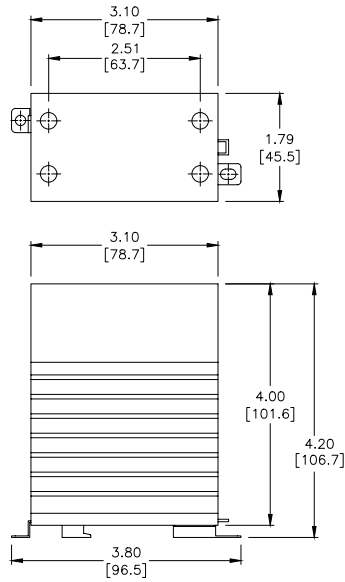
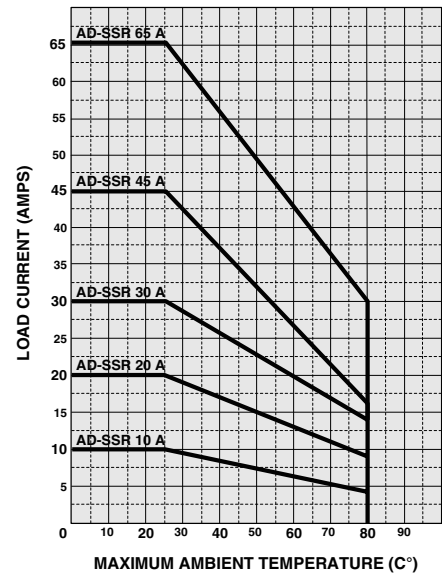


Figure 2

Note: Recommended spacing between multiple SSRs is 0.75 inch.

### AD-SSR Series derating chart



### AD-70S2 Series

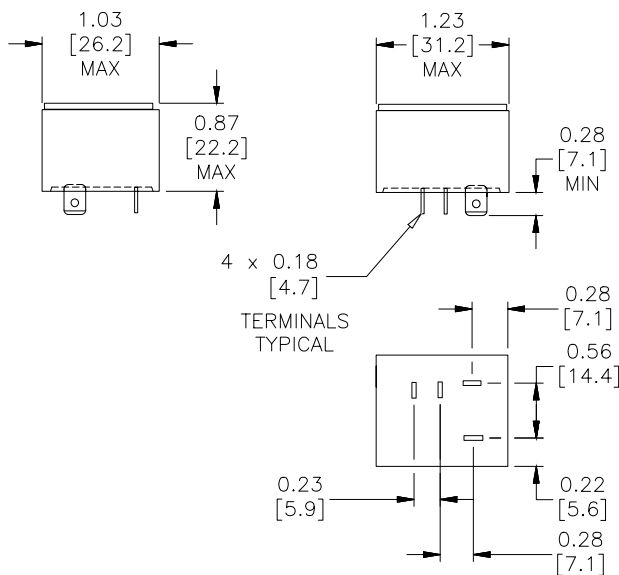
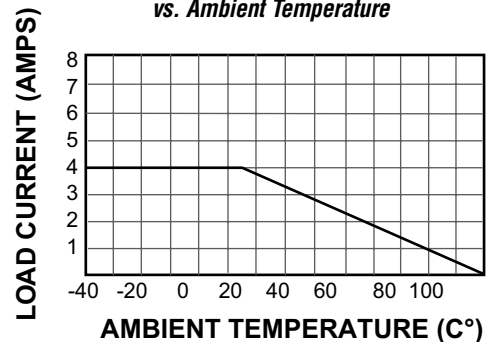


Figure 3

### AD-70S2 Series derating charts

Maximum Continuous Current vs. Ambient Temperature



Please see our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.

# 78 Series Relay Socket Dimensions

## Dimensions

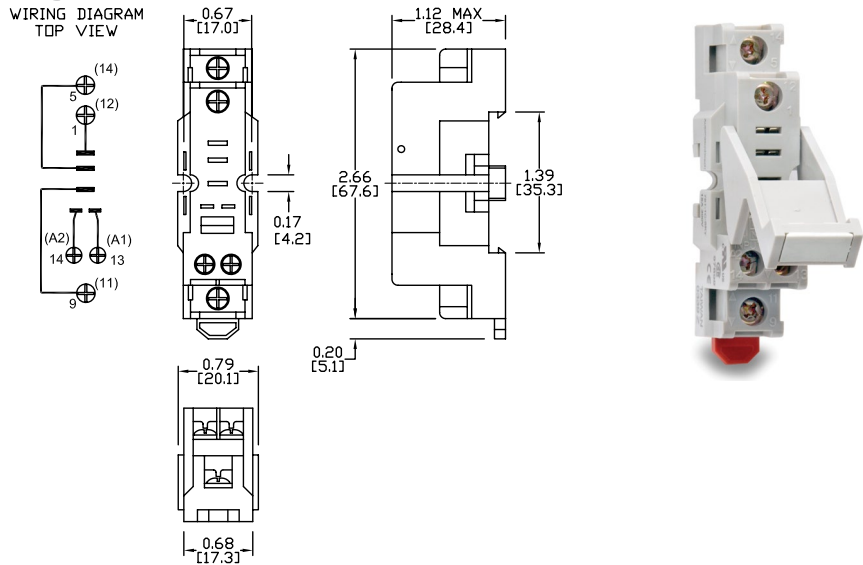
inches [mm]

**Figure 5: 781-1C-SKT**

DIN-rail mounting, SPDT, for use with 781 series relays

*Note: See Table on next page for maximum screw torques and wire sizes*

UL Recognized  
file number: E225080

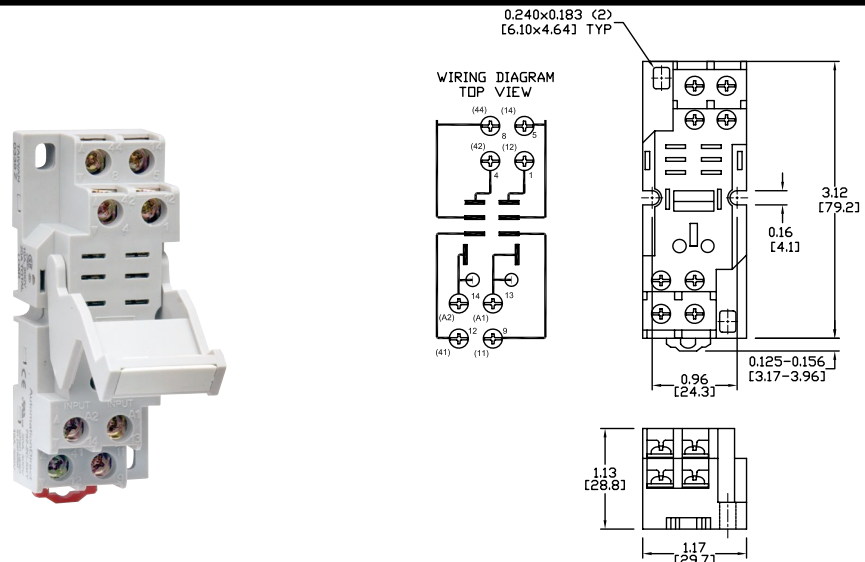


**Figure 6: 782-2C-SKT**

DIN-rail mounting, DPDT, for use with 782 series and AD-70S2 relays

*Note: See Table on next page for maximum screw torques and wire sizes*

UL Recognized  
file number: E225080

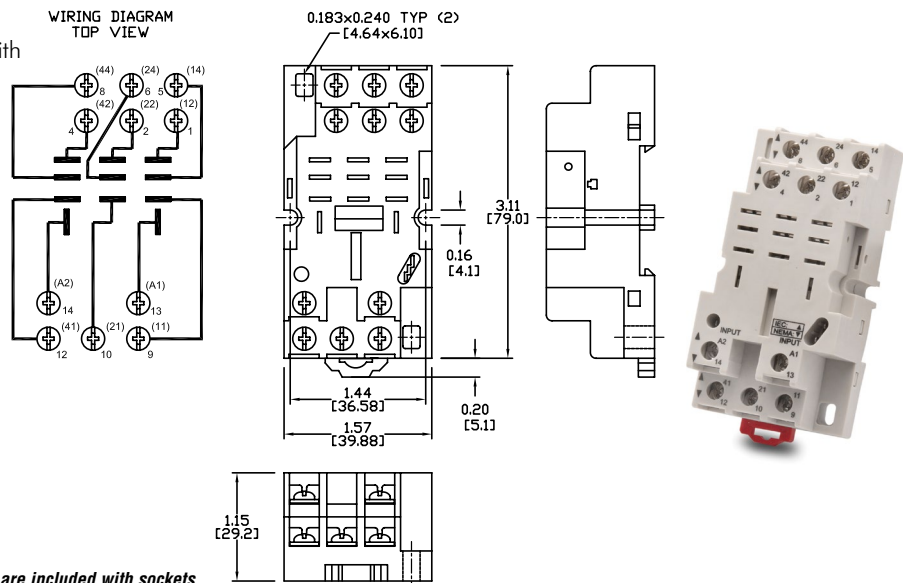


**Figure 7: 783-3C-SKT**

DIN-rail mounting, 3PDT, for use with 783 series relays.

*Note: See Table on next page for maximum screw torques and wire sizes*

UL Recognized  
file number: E225080



*Note: Order sockets separately; holding clips are included with sockets.*