

Solid-State Power Relays Selection Guide

Single Phase



Dual Output



AC or DC

Three Phase



Motor Controllers

Quad Output



**TELEDYNE
RELAYS**

A Teledyne Technologies Company



RoHS or Non-RoHS:
Your Choice!



Switching Solutions

Teledyne Relays has been providing industrial power solid-state relays for over 30 years. The company offers a broad range of products, from standard off-the-shelf single-, dual-, three- and quad-output relays to custom products with diagnostics and phase monitoring. These relays are used in numerous applications, including food equipment, heating, lighting, medical equipment, motor control, refrigeration, temp control and mil-aero applications. Teledyne's selection of high-quality components results in reduced EMI and lower start-up surges. The rugged design, including the direct-bond copper (DBC) and wirebond assembly, offers the most reliable and thermally efficient product on the market. Teledyne is also the world's innovative leader in manufacturing hermetically sealed solid-state and electromechanical relays. Teledyne Relays' industrial SSRs, mil-aero SSRs, electromechanical relays and coaxial switches offer switching solutions across a wide range of markets and applications.

Markets

- Industrial Power & Motion Control
- Temperature Control
- Lighting
- Motor Control
- Power Supplies
- Medical Equipment
- Commercial & Military Aviation
- Defense & Aerospace
- Telecom/Communications (Wireless)
- Instrumentation & Test

Product Assurance

Under an aggressive Total Quality Management (TQM) program, Teledyne Relays has embraced a "continuous improvement" culture. With recognized certifications such as ISO 9001/9002, DSCC MIL-STD-790 and Boeing D1-9000, Teledyne Relays has become a primary supplier of switching solutions with the highest quality and reliability to industry leaders around the world.

Technical Service & Customer Support

Teledyne Relays provides easy access to technical service and customer support. An innovative, integrated website makes it easy to find technical information, buy relays and even get e-mail responses within 24 hours.



Selection Matrix

 DIN Rail
 Pin-PCB
 Panel/Chassis

		CURRENT									
		≤ 125A									
		≤ 95A									
		≤ 75A									
		≤ 50A									
		≤ 35A									
		≤ 25A									
		≤ 12A									
		≤ 9A									
		≤ 4A									
AC	LINE VOLTAGE	≤ 30Vac/Vdc	TS								
		240Vac (≤ 280Vac)	AS4			SH	SH	SH	SH	SH	SH
			BS		STH	STH	STH	STH			
			SAS			SCH	SSH	SSH			
			TS/PS		S	S		SHP			
					ST	ST		ST	ST		
					X	X		SS	SS		
					EPC	DR		EPC			
						DRS		SD			
					FS	FS					
						L					
					LS						
					C3P						
					SQ						
	480Vac (≤ 520Vac)	AS4		G	DR3P	SH	SH	SH	SH	SH	
		MX		S3P		SCH	SCH	SCH			
						SSH	SSH				
					S		S	S	S	S	
					DR	DR	SS	SS			
					DRL	DRL	DRL	EPC		EPC	
					DRS	DRS	SD				
					DRD	XV	E3P	E3P			
				E3PT			E3PT	SHP		SHP	
		600Vac (≤ 690Vac)	AS4			LS	LS	SH	SH	SH	SH
	BS					STH	STH	STH			
							S	S	S	S	
				ST	ST		ST	ST			
							SD	X			
						E3PT	SD				
			E3P	E3P		E3P	E3P				
DC	VOLTAGE	≤ 30Vac/Vdc	TS								
		≤ 36Vdc	SDS		LS10						
			TS/PS	PS							
		≤ 60Vdc	SDS				SH10				
			DX								
			DS								
		≤ 130Vdc					S20	SH10		S20	
		≤ 220Vdc	DX								
			DS								
		≤ 350Vdc						S60			

SINGLE-PHASE AC SOLID-STATE RELAYS

Series SH High Industrial Performance (HIPpak) AC Solid-State Relays with Covers

Series SH relays offer high performance in a flexible, innovative package. Designed for all types of loads, they provide output to 125A, 690Vac. They incorporate removable touch-proof terminal covers for versatile, easy and quick connections. SH relays feature a metal baseplate and built-in LED. They are up to 30% lighter than standard relays.

- Random and zero-cross models available
- Low zero-cross turn-on voltage
- Input and output protection and control LED
- IP20 touch-proof terminal covers
- Heat sinks available



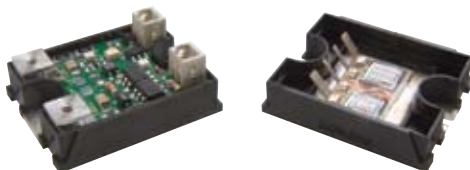
Optional connections

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SH24D25	25A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	600 A ² s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
SH24A25	25A	12–275 Vac	600 Vpeak	Zero Cross	20–265 Vac/Vdc	600 A ² s	
SH24D35	35A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	1250 A ² s	
SH24A35	35A	12–275 Vac	600 Vpeak	Zero Cross	20–265 Vac/Vdc	1250 A ² s	
SH24D50	50A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	2500 A ² s	
SH24R50	50A	12–275 Vac	600 Vpeak	Random	3–32 Vdc	2500 A ² s	
SH24R75	75A	12–275 Vac	600 Vpeak	Random	3–32 Vdc	7200 A ² s	
SH24D75	75A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	7200 A ² s	
SH24D95	95A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	14400 A ² s	
SH24D125	125A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	24000 A ² s	
SH48R35	35A	24–510 Vac	1200 Vpeak	Random	3.5–32 Vdc	1250 A ² s	
SH48D35	35A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	1250 A ² s	
SH48A35	35A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	1250 A ² s	
SH48R50	50A	24–510 Vac	1200 Vpeak	Random	3.5–32 Vdc	2500 A ² s	
SH48D50	50A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	2500 A ² s	
SH48A50	50A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	2500 A ² s	
SH48R75	75A	24–510 Vac	1200 Vpeak	Random	3.5–32 Vdc	7200 A ² s	
SH48D75	75A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	7200 A ² s	
SH48A75	75A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	7200 A ² s	
SH48R95	95A	24–510 Vac	1200 Vpeak	Random	3.5–32 Vdc	14400 A ² s	
SH48D95	95A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	14400 A ² s	
SH48A95	95A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	14400 A ² s	
SH48R125	125A	24–510 Vac	1200 Vpeak	Random	3.5–32 Vdc	24000 A ² s	
SH48D125	125A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	24000 A ² s	
SH48A125	125A	24–510 Vac	1200 Vpeak	Zero Cross	20–265 Vac/Vdc	24000 A ² s	
SH60D50	50A	24–690 Vac	1600 Vpeak	Zero Cross	3.5–32 Vdc	2500 A ² s	
SH60D75	75A	24–690 Vac	1600 Vpeak	Zero Cross	3.5–32 Vdc	7200 A ² s	
SH60D95	95A	24–690 Vac	1600 Vpeak	Zero Cross	3.5–32 Vdc	14400 A ² s	
SH60D125	125A	24–690 Vac	1600 Vpeak	Zero Cross	3.5–32 Vdc	24000 A ² s	

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.

TELEDYNE'S INNOVATIVE CONSTRUCTION

New construction method offers low profile, less weight, touchproof terminal covers and higher reliability. Teledyne's new HIPpak housing offers a new metallic base for screw terminals versus plastic to improve the ruggedness. The housing also offers hinged, removable terminal covers for opening and closing. Internal components are now surface mount, allowing for a lower profile. The power device continues to utilize a DBC (Direct Bond Copper) process between the copper and alumina substrate. The DBC process offers the most efficient means of transferring thermal energy out of the device. The construction also incorporates wirebonds versus clips and jumpers. This feature reduces the thermal stress improving the reliability of the relay (see chart, page 20).



HIPpak interior

SINGLE-PHASE AC SOLID-STATE RELAYS



Series STH High Industrial Performance (HIPpak) AC Solid-State Relays

Series STH relays offer high performance in a flexible, innovative package. Designed for all types of loads, they deliver output to 75A, 600Vac for resistive loads. They have removable touch-proof terminal covers for versatile, easy and quick connections. STH relays feature a metal baseplate and are up to 30% lighter than standard relays.

- Regulated input current
- Low zero-cross turn-on voltage
- Input protection and control LED standard
- IP20 touch-proof terminal covers optional
- Heat sinks available

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
STH24D12	12A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	128 A ² s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
STH24D25	25A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	600 A ² s	
STH24D35	35A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	1250 A ² s	
STH24D50	50A	12–280 Vac	600 Vpeak	Zero Cross	3–32 Vdc	2500 A ² s	
STH48D35	35A	24–600 Vac	1200 Vpeak	Zero Cross	3–32 Vdc	1250 A ² s	
STH48D50	50A	24–600 Vac	1200 Vpeak	Zero Cross	3–32 Vdc	2500 A ² s	
STH48D75	75A	24–600 Vac	1200 Vpeak	Zero Cross	3–32 Vdc	7200 A ² s	

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.
IP20 touchproof covers option: -17



Series SCH High Industrial Performance (HIPpak) AC Solid-State Relays

Series SCH relays deliver high performance in a flexible, innovative package. Designed for all types of loads, they offer output to 75A, 510Vac. They incorporate removable touch-proof terminal covers and easy connect spring connectors. SCH relays feature a metal baseplate. They are up to 30% lighter than standard relays.

- Low zero-cross turn-on voltage (<12V)
- Input and output protection
- IP20 protection by terminal covers on load terminals
- Regulated input current
- Control status LED

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SCH24D25	25A	12–275 Vac	600 Vpeak	Zero Cross	3–32 Vdc	600 A ² s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
SCH48D35	35A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	1250 A ² s	
SCH48D50	50A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	2500 A ² s	
SCH48D75	75A	24–510 Vac	1200 Vpeak	Zero Cross	3.5–32 Vdc	7200 A ² s	

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.



Series SSH High Industrial Performance (HIPpak) AC Solid-State Relays

Series SSH relays deliver high performance in a flexible, innovative package. Designed for all types of loads, they offer output to 75A, 510Vac with diagnostics and removable touch-proof terminal covers. SSH relays feature a metal baseplate and are up to 30% lighter than standard relays. SSH Series relays offer system health.

- Built-in diagnostics with status LED
- Low zero-cross turn-on voltage
- Input and output protection and control LED standard
- IP20 protection by terminal covers on load terminals
- Easy connect spring terminals

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SSH24D35	35A	50–265 Vac	600 Vpeak	Zero Cross	7–30 Vdc	1250 A ² s	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
SSH24D50	50A	24–265 Vac	1200 Vpeak	Zero Cross	7–30 Vdc	2500 A ² s	
SSH48D50	50A	24–510 Vac	1200 Vpeak	Zero Cross	7–30 Vdc	2500 A ² s	
SSH48D75	75A	24–510 Vac	1200 Vpeak	Zero Cross	7–30 Vdc	7200 A ² s	

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.

SINGLE-PHASE AC SOLID-STATE RELAYS



Series S AC Hockey Puck Solid-State Relays

The Series S single-phase relays are designed for all types of loads. The design incorporates an SCR or triac output. The relays utilize optical isolation to protect the control from load transients. All contain an internal snubber for output protection. High-current models are excellent for motor and UPS control.

- Low zero-cross turn-on voltage for low EMI
- AC or DC control available
- Excellent thermal performance
- High immunity to surges
- Internal snubber (except S60 models)

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
S24R12	12A	12–280 Vrms	600 Vpeak	Random	3–30 Vdc	72 A ² s	2.29 x 1.75 x 1.06 in. 58.2 x 44.5 x 27 mm
S24A12	12A	12–280 Vrms	600 Vpeak	Zero Cross	90–240 Vac/Vdc	72 A ² s	
S24D25	25A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	288 A ² s	
S24A25-22	25A	12–280 Vrms	600 Vpeak	Zero Cross	17–80 Vac/Vdc	288 A ² s	
S24R40	40A	12–280 Vrms	600 Vpeak	Random	3–30 Vdc	612 A ² s	
S24D40	40A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	612 A ² s	
S24A40	40A	12–280 Vrms	600 Vpeak	Zero Cross	90–240 Vac/Vdc	612 A ² s	
S24A40-22	40A	12–280 Vrms	600 Vpeak	Zero Cross	17–80 Vac/Vdc	612 A ² s	
S48R25	25A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	265 A ² s	
S48D25	25A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	265 A ² s	
S48A25-22	25A	24–520 Vrms	1200 Vpeak	Zero Cross	17–80 Vac/Vdc	265 A ² s	
S48R50	50A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	1500 A ² s	
S48D50	50A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	1500 A ² s	
S48A50	50A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	1500 A ² s	
S48A50-22	50A	24–520 Vrms	1200 Vpeak	Zero Cross	17–80 Vac/Vdc	1500 A ² s	
S48R75	75A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	5000 A ² s	
S48D75	75A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	5000 A ² s	
S48A75	75A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	5000 A ² s	
S48R95	95A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	11000 A ² s	
S48D95	95A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	11000 A ² s	
S48A95	95A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	11000 A ² s	
S48R125	125A	24–520 Vrms	1200 Vpeak	Random	4–30 Vdc	20000 A ² s	
S48D125	125A	24–520 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	20000 A ² s	
S48A125	125A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	20000 A ² s	
S48A125-22	125A	24–520 Vrms	1200 Vpeak	Zero Cross	17–80 Vac/Vdc	20000 A ² s	
S60D50	50A	24–660 Vrms	1600 Vpeak	Zero Cross	7–30 Vdc	1500 A ² s	
S60D75	75A	24–660 Vrms	1600 Vpeak	Zero Cross	7–30 Vdc	5000 A ² s	
S60D95	95A	24–660 Vrms	1600 Vpeak	Zero Cross	7–30 Vdc	11000 A ² s	
S60D125	125A	24–660 Vrms	1600 Vpeak	Zero Cross	7–30 Vdc	20000 A ² s	

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.

SINGLE-PHASE AC SOLID-STATE RELAYS



Series ST AC Hockey Puck Solid-State Relays

Series ST relays are designed for high-power applications. The design incorporates an SCR or triac output. The relays utilize optical isolation to protect the control from load transients. A control LED is available on certain models. All Series ST relays are zero crossing. Internal MOV is also available on ST24D 25A and 50A models.

- Tight zero-cross window for low EMI
- AC or DC control available
- Excellent thermal performance
- Internal MOV (certain models)
- Control LED (certain models)

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
ST24D12	12A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	72 A ² s	2.29 x 1.75 x 1.06 in. 58.2 x 44.5 x 27 mm
ST24D12-02	12A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	72 A ² s	
ST24D25	25A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	288 A ² s	
ST24D25-16	25A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	288 A ² s	
ST24A25	25A	12–280 Vrms	600 Vpeak	Zero Cross	90–240 Vac/Vdc	288 A ² s	
ST24D50	50A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	1500 A ² s	
ST24D50-16	50A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	1500 A ² s	
ST24A50	50A	12–280 Vrms	600 Vpeak	Zero Cross	90–240 Vac/Vdc	1500 A ² s	
ST24D75	75A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	5000 A ² s	
ST48D12-02	12A	24–600 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	72 A ² s	
ST48A25-22	25A	24–600 Vrms	1200 Vpeak	Zero Cross	17–80 Vac/Vdc	265 A ² s	
ST48D40-02	40A	24–600 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	612 A ² s	
ST48D50-02	50A	24–600 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	1500 A ² s	
ST48D75-02	75A	24–600 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	5000 A ² s	

-02 = Control LED; -16 = Internal MOV; -22 = 24 Vac control
See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.



Series X AC Solid-State Relays

Series X relays are designed in a thin compact plastic package. The X relays offer touch-proof spring terminals for ease of use and user safety. With its medium-power handling capabilities and compact size, the Series X is an excellent choice for medium-power AC loads. Solid-state technology also offers long service life.

- Compact package
- Solid-state relay designed for most loads
- Touch-proof spring-load terminals
- Back-to-back thyristors on output for long life
- Zero-cross turn-on voltage for low EMI

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
X24D16	25A*	12–280 Vrms	600 Vpeak	Zero Cross	7–30 Vdc	310 A ² s	
X48D75	75A	24–600 Vrms	1200 Vpeak	Zero Cross	5–30 Vac	5000 A ² s	
X60R75	75A	24–690 Vrms	1600 Vpeak	Random	4–30 Vac	5000 A ² s	

*Terminals limited at 16A
For RoHS Compliant contact factory.

SINGLE-PHASE AC SOLID-STATE RELAYS



Series SS AC Solid-State Relays with Diagnostics

Series SS relays deliver output to 75A, 510Vac with diagnostics. Designed for all types of loads, the SS is ideal for applications requiring system health / diagnostics. SSH relays feature a metal baseplate for excellent thermal performance. The control LED, status LED, and solid state status output provides electronic and visual fault detection.

- Fault detection: line or load open; short-circuit
- Terminal block for control and status connections
- Control and status LED indicators
- Low zero-cross turn-on voltage
- Solid-state N.C. status output without power supply

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SS24D50	50A	70–280 Vac	600 Vpeak	Zero Cross	7–32 Vdc	1250 A ² s	2.29 x 1.75 x 1.38 in. 58.2 x 44.5 x 35 mm
SS24D75	75A	70–280 Vac	600 Vpeak	Zero Cross	7–32 Vdc	5000 A ² s	
SS48D50	50A	150–510 Vac	1200 Vpeak	Zero Cross	8–32 Vdc	1250 A ² s	
SS48D75	75A	150–510 Vac	1200 Vpeak	Zero Cross	8–32 Vdc	5000 A ² s	

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.



Series DR DIN-Rail AC Solid-State Relays

Series DR DIN-rail relays are designed for all types of loads. The relays utilize optical isolation to protect the control from load transients. DR relays have an integral heat sink, and can be mounted and dismantled onto a DIN rail without tools. The relays may also be panel mounted. All relays offer a green control LED and transient suppression.

- Tool-free DIN-rail mount or direct panel mount
- Zero-cross and random models
- Very high immunity
- Low leakage current
- Internal transient suppression

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
DR24D25	25 Arms	12–275 Vrms	600 Vpeak	Zero Cross	3–32 Vdc	312 A ² s	3.15 x 4.69 x .89 in. 80 x 119.1 x 22.5 mm
DR24A25	25 Arms	12–275 Vrms	600 Vpeak	Zero Cross	150–240 Vac/Vdc	312 A ² s	
DR24A25-22	25 Arms	12–275 Vrms	600 Vpeak	Zero Cross	17–60 Vac/Vdc	312 A ² s	
DR48A25-21	30 Arms	12–480 Vrms	1200 Vpeak	Zero Cross	3–32 Vdc	1500 A ² s	
DR48D25	25 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	1500 A ² s	
DR48R25	30 Arms	24–510 Vrms	1200 Vpeak	Random	3.5–32 Vdc	1500 A ² s	
DR48A25	30 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	150–240 Vac/Vdc	1500 A ² s	
DR48A25-22	30 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	17–60 Vac/Vdc	1500 A ² s	
DR48D30	30 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	5000 A ² s	

-21 = Self turn-on suppression; -22 = 17–60 Vac/Vdc
For RoHS Compliant contact factory.



Series DRL DIN-Rail AC Solid-State Relays with Heat Sinks

Series DRL DIN-rail relays are designed for all types of loads. The relays utilize optical isolation to protect the control from load transients. They have an integral heat sink, and can be mounted and dismantled onto a DIN rail without any tools. DRL relays may also be panel mounted. All relays offer a green control LED and transient suppression.

- Tool-free DIN-rail mount or direct panel mount
- Zero-cross and random models
- Very high immunity
- Low leakage current
- Internal transient suppression

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
DRL48R35	35A	24–510 Vrms	1200 Vpeak	Random	3.5–32 Vdc	600 A ² s	3.15 x 1.77 x 4.69 in. 80 x 44.9 x 119.1 mm
DRL48D35-21	35A	24–510 Vrms	1200 Vpeak	Zero Cross	3–32 Vdc	600 A ² s	
DRL48D35	35A	24–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	1250 A ² s	
DRL48A35-22	35A	24–510 Vrms	1200 Vpeak	Zero Cross	17–60 Vac/Vdc	1250 A ² s	
DRL48A35	35A	24–510 Vrms	1200 Vpeak	Zero Cross	150–240 Vac/Vdc	2500 A ² s	

-21 =Self turn-on suppression
For RoHS Compliant contact factory.

SINGLE-PHASE AC SOLID-STATE RELAYS



Series SF Slimpak AC Solid-State Relays

Series SF relays are designed for multiple applications, including those where hockey puck style relays need to be mounted onto a PCB. The SF relays are designed with high efficiency Thyristors that offer lower power dissipation, higher surge current rating and lower thermal resistance. All relays offer a control LED for diagnostics.

- Random and zero-cross models available
- Low zero-cross turn-on voltage
- Input protection and control LED standard
- Connectors for power wiring and heatsinks available.

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SF24D25	25A	12–280 Vrms	600 Vpeak	Zero Cross	3–32 Vdc	600 A ² s	2.3 x 1.77 x .64 in. 58.5 x 45 x 16.3 mm
SF24R50HE	50A	12–275 Vrms	600 Vpeak	Random	3–32 Vdc	1680 A ² s	
SF60D50HE	50A	24–600 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	1680 A ² s	

For RoHS Compliant contact factory.



Series DRS DIN-Rail AC Solid-State Relays with Heat Sinks and Diagnostics

Series DRS DIN-rail relays with diagnostics are designed for all types of loads. The relays utilize optical isolation to protect the control from load transients. DRS relays have an integral heat sink and can be DIN rail mounted without tools. All relays offer a control LED, status output, and output LED for diagnostics.

- Tool-free DIN-rail mount or direct panel mount
- Output status for Diagnostics
- Low zero-cross turn-on voltage for low EMI
- 50A back-to-back thyristors
- LEDs for visual diagnostics

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
DRS24D25	25A	12–275 Vrms	600 Vpeak	Zero Cross	3–32 Vdc	1500 A ² s	3.15 x .89 x 4.69 in. 80 x 22.5 x 119.1 mm
DRS48D25	25A	150–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	1500 A ² s	
DRS48D30	30A	150–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	5000 A ² s	

For RoHS Compliant contact factory.



Series FS Miniature AC Solid-State Relays

Series FS relays are designed for medium-power loads. The relays incorporate a triac output and utilize optical isolation to protect the control from load transients. The package is available with faston or PCB terminals. The compact size of the FS makes it ideal for designs where space is limited. The FS has excellent thermal performance.

- Miniature package
- Faston or PCB terminals available
- Tight zero-cross window for low EMI
- Excellent thermal performance
- High immunity to surges

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
FS24R10-06	10A	12–280 Vrms	600 Vpeak	Random	3–30 Vdc	72 A ² s	1.18 x .83 x .59 in. 30 x 21 x 15 mm
FS24D10-06	10A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	72 A ² s	
FS24D10	10A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	72 A ² s	
FS24D20-06	20A	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	200 A ² s	

-06 = Faston

RoHS Compliant available with option: /R



Series G AC Solid-State Relays

Series G relays are designed for medium-power loads. The design incorporates a thyristor output. Series G relays utilize optical isolation to protect the control from load transients. An internal MOV is also provided to protect against load transient voltages. The compact size makes it ideal for designs where space is limited.

- Miniature size package
- Power and control connections by Faston terminals
- Internal MOV protection
- Excellent thermal performance
- High immunity to surges

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
G24R12-06	12 Arms	12–320 Vrms	520 Vpeak	Random	3–32 Vdc	340 A ² s	2.63 x 1.50 x .87 in. 56.9 x 38 x 22 mm
G24D12-06	12 Arms	12–320 Vrms	520 Vpeak	Zero Cross	4–32 Vdc	340 A ² s	

-06 = Faston

For RoHS Compliant contact factory.

SINGLE-PHASE AC SOLID-STATE RELAYS



Series XV No Heat Sink AC Hybrid Relays

Series XV relays combine the best of solid-state and electromechanical technology. The relay is designed in a touch-proof hockey-puck package. The XV relay switches current up to 30A without a heat sink. Visual control status is provided as a standard. Elimination of the heat sink conserves space and makes the XV ideal for many applications.

- Industry-standard package
- Requires no heat sink
- Low zero-cross turn-on voltage for low EMI
- Control LED
- High immunity to surges

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
XV46D30K	30A	12–420 Vrms	800 Vpeak	Zero Cross	20–30 Vdc	288 A ² s	2.41 x 1.75 x 1.77 in.
XV46D30C	30A	12–420 Vrms	800 Vpeak	Zero Cross	12 Vdc	288 A ² s	61.3 x 44.5 x 45 mm

For RoHS Compliant contact factory.



Series SHPXXNXXA



Series SHPXXNXXR

Series SHP Phase-Control AC Solid-State Relays

The Series SHP phase-angle controller provides analog switching. It features an internal microcontroller and overvoltage protection. Choose relays with either removable input spring connectors or IP20 touch-proof flaps. The relays are designed in conformity with EN60947-4-3 (IEC947-4-3) and EN60950/VDE0805 (Reinforced Insulation).

- Microcontroller inside
- Analog switching
- Overvoltage protection by varistor
- Green LED for input visualization
- Short-circuit protection

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SHP24N50A	50A	90–280 Vac	600 Vpeak	Phase Angle	0–10 V	2500 A ² s	1.77 x 2.30 x 1.32 in. 45 x 58.5 x 33.6 mm
SHP24N50R	50A	90–280 Vac	600 Vpeak	Phase Angle	4–20 mA	2500 A ² s	1.77 x 2.30 x 1.18 in. 45 x 58.5 x 30 mm
SHP48N75A	75A	200–240 Vac	1200 Vpeak	Phase Angle	0–10 V	7200 A ² s	1.77 x 2.30 x 1.32 in. 45 x 58.5 x 33.6 mm
SHP48N75R	75A	200–240 Vac	1200 Vpeak	Phase Angle	4–20 mA	7200 A ² s	1.77 x 2.30 x 1.18 in. 45 x 58.5 x 30 mm
SHP48N125A	125A	200–240 Vac	1200 Vpeak	Phase Angle	0–10 V	7200 A ² s	1.77 x 2.30 x 1.32 in. 45 x 58.5 x 33.6 mm
SHP48N125R	125A	200–240 Vac	1200 Vpeak	Phase Angle	4–20 mA	7200 A ² s	1.77 x 2.30 x 1.18 in. 45 x 58.5 x 30 mm

For RoHS Compliant contact factory.



Series EPC Phase-Control AC Solid-State Relays

The Series EPC phase-angle controller has an analog input isolated from the mains to vary the phase angle proportionally to the input and load voltage. The EPC phase-angle controller is designed for dimming and heat temperature regulation. The EPC provides internal protection from load transients. The conduction level is controlled from 0–100%.

- External phase angle adjust
- Built-in LED
- Excellent thermal performance
- Internal output protection
- RoHS Compliant available with option -/R

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
EPC24N10A	10 Arms	115–265 Vrms	600 Vpeak	Phase Angle	0–10 V	72 A ² s	3.94 x 2.89 x 1.55 in. 100 x 73.5 x 39.5 mm
EPC24N40A	40 Arms	115–265 Vrms	600 Vpeak	Phase Angle	0–10 V	1500 A ² s	
EPC24N40R	40 Arms	115–265 Vrms	600 Vpeak	Phase Angle	4–20 mAdc	1500 A ² s	
EPC46N70A	70 Arms	200–460 Vrms	1200 Vpeak	Phase Angle	0–10 V	5000 A ² s	
EPC46N110A	110 Arms	200–460 Vrms	1200 Vpeak	Phase Angle	0–10 V	20000 A ² s	

For RoHS Compliant contact factory.

SINGLE-PHASE AC SOLID-STATE RELAYS



Series L Ultraminiature AC Solid-State Relays

Series L relays are designed to control medium-power AC loads, while occupying minimal board space. The Series L is an excellent choice for a PCB-mount power-switching relay. A thermal pad is available to eliminate thermal grease when mounting it on to a heat sink. The relay's optical isolation protects the control from load transients.

- Ultraminiature package
- Zero-cross turn-on voltage
- Designed for PC board mounting
- Optional thermal pad available
- High immunity to transients

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
L24D25C	25 Arms	24–280 Vrms	600 Vpeak	Zero Cross	3.5–15 Vdc	260 A ² s	1.37 x 1.12 x .37 in. 35 x 28.3 x 9.4 mm
L24D25G	25 Arms	24–280 Vrms	600 Vpeak	Zero Cross	12.5–32 Vdc	260 A ² s	
L24D40G	40 Arms	24–280 Vrms	600 Vpeak	Zero Cross	12.5–32 Vdc	612 A ² s	

RoHS Compliant



Series LS AC Solid-State Relays with Optional Heat Sinks

Series LS single-inline package (SIP) relays are designed for mounting on printed circuit boards. LS relays facilitate heat sinking by providing an metallic interface surface. The relays use a direct-bonded copper substrate for thermal efficiency, thermal stress performance and long-life expectancy. Optional heat sinks are available.

- Compact SIP package
- Designed for external heat-sink attachment
- Over-sized thyristor ratings (up to 50A)
- Direct-copper bonding technology
- Optional heat sinks available

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
LS24D16C	16A	12–280 Vrms	600 Vpeak	Zero Cross	4–14 Vdc	128 A ² s	LS: 1.72 x .96 x .25 in. 43.6 x 24.5 x 6.3 mm
LS24D16C-HS1	16A	12–280 Vrms	600 Vpeak	Zero Cross	4–14 Vdc	128 A ² s	
LS24D16N-HS1	16A	12–280 Vrms	600 Vpeak	Zero Cross	8–32 Vdc	128 A ² s	
LS24D21C	21A	12–280 Vrms	600 Vpeak	Zero Cross	4–14 Vdc	312 A ² s	LS with H1 Heat Sink: 1.72 x 1.4 x .87 in. 43.6 x 35.7 x 22 mm
LS60D22C	22A	24–600 Vrms	1200 Vpeak	Zero Cross	4–14 Vdc	450 A ² s	
LS60D22C-HS1	22A	24–600 Vrms	1200 Vpeak	Zero Cross	4–14 Vdc	450 A ² s	
LS24D27C	27A	12–280 Vrms	600 Vpeak	Zero Cross	4–14 Vdc	1800 A ² s	
LS60D27C	27A	24–600 Vrms	1200 Vpeak	Zero Cross	4–14 Vdc	1800 A ² s	
LS60D30C	30A	24–600 Vrms	1200 Vpeak	Zero Cross	4–14 Vdc	5000 A ² s	

LS with HS1 heat sink

-HS1 = With heat sink
RoHS Compliant



Series AS4 Single-Inline Package AC Solid-State Relays

Series AS4 solid-state single inline (SIP) four-pin relays are designed for mounting on a printed circuit board. The relays offer built-in voltage protection and can withstand very high current overloads. The relays have a low zero-cross window. The compact size and triac output make the AS relay the perfect retrofit for electromechanical relays.

- Industry-standard package
- Tight zero-cross window for low EMI
- Low input current draw
- Integral transient voltage protection
- DIN rail available

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
AS24D4E	4 Arms	12–275 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	50 A ² s	1.70 x 1.0 x .39 in. 43.2 x 25.4 x 10.2 mm
AS24D4E-X1	4 Arms	12–275 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	50 A ² s	
AS24D4E-X2	4 Arms	12–275 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	50 A ² s	
AS24R4E	4 Arms	12–275 Vrms	600 Vpeak	Random	4–30 Vdc	50 A ² s	
AS46D4E	4 Arms	12–460 Vrms	900 Vpeak	Zero Cross	4–30 Vdc	50 A ² s	
AS46R4E	4 Arms	12–460 Vrms	900 Vpeak	Random	4–30 Vdc	50 A ² s	
AS46R4F-02	4 Arms	12–460 Vrms	900 Vpeak	Random	7–30 Vdc	50 A ² s	
AS60D4E	4 Arms	24–600 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	72 A ² s	

-02 = LED; X1 = DIN rail clip with LED; X2 = DIN rail clip without LED
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SINGLE-PHASE AC SOLID-STATE RELAYS



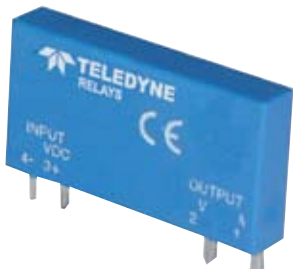
Series BS Single-Inline Package AC Solid-State Relays

Series BS 4-amp solid-state single inline (SIP) four-pin relays are designed for mounting on a printed circuit board. BS relays can withstand very high current overloads. The compact size and triac output make the BS relay an excellent choice for switching medium-power resistive loads.

- Industry-standard package
- High in-rush capabilities
- Low input current draw
- Low zero-cross turn-on voltage for low EMI
- Up to 600Vrms load voltage

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I _{ft}	Dimensions LxWxH
BS24D4A	4 Arms	15–280 Vrms	600 Vpeak	Zero Cross	3–10 Vdc	50 A ² s	1.70 x 1.0 x .39 in. 43.2 x 25.4 x 10.2 mm
BS24D4F	4 Arms	15–280 Vrms	600 Vpeak	Zero Cross	8–30 Vdc	50 A ² s	
BS60D4A	4 Arms	24–600 Vrms	1200 Vpeak	Zero Cross	3.7–10 Vdc	72 A ² s	

RoHS Compliant available with option: /R



Series SAS Slim Single-Inline Package AC Solid-State Relays

The Series SAS slim single-inline package (SIP) relays save space on printed circuit boards. SAS relays, designed for AC applications, offer a 280Vac 2A output. They feature an integrated snubber and high surge handling capability, up to 30 times nominal current. The low-cost plastic relays are ideal for medium-power AC loads.

- Slim compact design
- Designed for printed circuit board
- Integrated snubber
- High surge handling capability
- 80A surge handling capability

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I _{ft}	Dimensions LxWxH
SAS28D2A	2A	12–280 Vrms	600 Vpeak	Zero Cross	3–10 Vdc	36 A ² s	1.10 x .20 x .59 in. 28 x 5 x 15 mm
SAS28D2C	2A	12–280 Vrms	600 Vpeak	Zero Cross	7–20 Vdc	36 A ² s	
SAS28D2K	2A	12–280 Vrms	600 Vpeak	Zero Cross	18–32 Vdc	36 A ² s	

RoHS Compliant



Series TS



Series PS



Series TS and Series PS AC Solid-State Relays

Series TS and Series PS relays provide AC/DC switching in a compact size. They also provide AC/DC control. These relays can withstand high surge currents. TS and PS relays are pin-to-pin compatible with electromechanical relays and may be used as replacements. Applications include vending machines, lighting and fans.

- Compact size
- Pin-to-pin compatible with electromechanical relays
- AC and DC control; AC and DC output
- Random and zero-cross turn-on voltage
- High inrush capabilities

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I _{ft}	Dimensions LxWxH
TS24D2G	2 Arms	12–275 Vrms	600 Vpeak	Zero Cross	12–30 Vac/Vdc	50 A ² s	1.14 x .50 x .62 in. 29 x 12.7 x 15.7 mm
TS3R1G	1 Arms	0–30 Vac/Vdc	60 Vpeak	Random	12–30 Vac/Vdc	50 A ² s	
PS24D4G	4 Arms	12–275 Vrms	600 Vpeak	Zero Cross	12–30 Vac/Vdc	50 A ² s	1.14 x .50 x 1 in. 29 x 12.7 x 25.4 mm

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DUAL-OUTPUT AC SOLID-STATE RELAYS



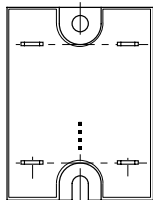
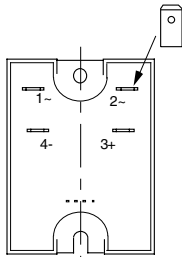
Series MX DIN-Rail AC Solid-State Relays

Series MX relays are a new generation of solid-state relays for DIN-rail mounting. The MX relays are internally wired to provide a common control. The relays are placed on a single DIN-rail fixture, saving designers time and space. The Series MX relays provide a control status LED and internal output protection.

- Solid-state relays for DIN-rail mounting
- Two- or three-pole output with single control
- Tight zero-cross window for low EMI
- Control LED
- Integrated clamping voltage

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
MX2P46D4T-02	2.5 Arms	24–460 Vrms	1200 Vpeak	Zero Cross	15–40 Vdc	50 A ² s	3.01 x .98 x 2.09 in. 76.4 x 25 x 53 mm
MX3P46D4S-02	2.5 Arms	24–460 Vrms	1200 Vpeak	Zero Cross	12–35 Vdc	50 A ² s	3.01 x 1.87 x 2.09 in. 76.4 x 47.5 x 53 mm

-02 = LED
RoHS Compliant



Series SD Dual-Output AC Solid-State Relays

Series SD dual-phase relays are designed for all types of loads. The design incorporates two relays in a single package. The relays utilize optical isolation to protect the control from load transients. High-current models are excellent for motor and phase angle control. SD Series are available with faston or screw terminals.

- Designed for all types of loads
- Dual output (two relays in one package)
- Faston or screw terminals
- Tight zero-cross window for low EMI
- High immunity to surges

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SD24D25-06	25 Arms	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	288 A ² s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD24R50-06	50 Arms	12–280 Vrms	600 Vpeak	Random	4–30 Vdc	1500 A ² s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD24R50	50 Arms	12–280 Vrms	600 Vpeak	Random	4–30 Vdc	1500 A ² s	2.28 x 1.75 x 1.06 in. 58 x 44.5 x 27 mm
SD24D50-06	50 Arms	12–280 Vrms	600 Vpeak	Zero Cross	4–30 Vdc	1500 A ² s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD48D40-06	40 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	5–30 Vdc	612 A ² s	2.28 x 1.75 x 1.26 in. 58 x 44.5 x 32 mm
SD48D50A	50 Arms	24–600 Vrms	1200 Vpeak	Zero Cross	10–30 Vdc	1500 A ² s	2.28 x 1.75 x 1.06 in. 58 x 44.5 x 27 mm
SD48D50A2	50 Arms	24–600 Vrms	1200 Vpeak	Zero Cross	10–30 Vdc	1500 A ² s	2.28 x 1.75 x 1.40 in. 58 x 44.5 x 35.6 mm

-06 = Faston terminals
See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.

View data sheet for package detail.



Series DRD Dual-Output DIN-Rail AC Solid-State Relays

Series DRD dual-output DIN-rail relays are designed for all types of loads. This dual package allows users to conserve cabinet space. They have an integral heat sink, and can be mounted and dismantled onto a DIN rail without tools. DRD relays may also be panel mounted. They offer a green control LED and transient suppression.

- User friendly mounting and dismantling
- Zero-cross and random models; thyristor output
- Green control LED and low leakage
- Very high immunity
- Internal transient suppression

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
DRD48A20	20 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	150–240 Vac/Vdc	1500 A ² s	3.15 x 4.69 x 1.768 in. 80 x 119.1 x 44.9 mm
DRD48D20	20 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	1500 A ² s	
DRD48R20	20 Arms	24–510 Vrms	1200 Vpeak	Random	3.5–32 Vdc	1500 A ² s	
DRD48D25	25 Arms	24–510 Vrms	1200 Vpeak	Zero Cross	3.5–32 Vdc	5000 A ² s	

For RoHS Compliant contact factory.

THREE-PHASE AC SOLID-STATE RELAYS



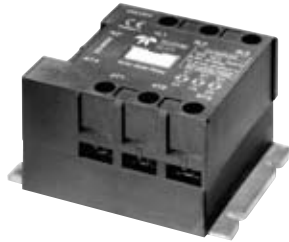
Series E3P Three-Phase AC Solid-State Relays

Series E3P three-phase relays are designed for all types of loads. The design incorporates an oversized thyristor output. Control status LED is standard on all models. Output protection is provided internally on certain models. The E3P is available in random and zero-cross turn-on. High-current models are ideal for motor control.

- Three-phase output
- AC or DC control
- Internal output protection
- Tight zero-cross window for low EMI
- High immunity to surges

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
E3P48R50-16	50A	24–520 Vrms	1200 Vpeak	Random	8.5–30 Vdc	1500 A ² s	3.94 x 2.89 x 1.56 in. 100 x 73.5 x 39.5 mm
E3P48D75-16	75A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	5000 A ² s	
E3P48D25	25A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	265 A ² s	
E3P48D50	50A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	1500 A ² s	
E3P48A50	50A	24–600 Vrms	1200 Vpeak	Zero Cross	90–240 Vac/Vdc	1500 A ² s	
E3P48D75	75A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	5000 A ² s	

-16 = Internal protection
For RoHS Compliant contact factory.



Series E3PT Three-Phase Touch-Proof AC Solid-State Relays

Series E3PT three-phase solid-state relays are designed for all types of loads. The E3PT relays include as a standard a control LED for visual status. The E3PT is touch-proof for user safety. An internal MOV and snubber circuit protect the output thyristor. The E3PT relays are highly immune to large current surges.

- Designed for all types of loads
- Tight zero-cross window for low EMI
- Control LED on all models
- Internal output transient protection
- IP20 touch-proof

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
E3PT48D12	12A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	72 A ² s	3.94 x 2.99 x 2.22 in. 100 x 76 x 56.5 mm
E3PT48A12	12A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vac	72 A ² s	
E3PT48D50	50A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	5000 A ² s	
E3PT48A50	50A	24–600 Vrms	1200 Vpeak	Zero Cross	90–240 Vac	5000 A ² s	
E3PT48D50H	50A	24–600 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc	20,000 A ² s	
E3PT48A50H	50A	24–600 Vrms	1200 Vpeak	Zero Cross	90–240 Vac	20,000 A ² s	

H = High surge capability
For RoHS Compliant contact factory.



Series DR3P Three-Phase AC Solid-State Relays with Heat Sink and DIN Rail

Series DR3P solid-state relays provide three-phase output, offering both AC and DC control with a zero-cross turn-ON thyristor output. The DR3P provides an integrated heat sink, output transient suppression (MOV and snubber circuit) and LEDs that serve as status indicators for diagnostics. The relays are designed for DIN-rail or panel mounting.

- Three-phase solid-state relay with heat sink
- DIN rail or panel mounting
- AC/DC control voltage with input status LED
- Internal protection by integrated snubber MOV
- IP20 touch-proof

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
DR3P48D50	22A	24–520 Vrms	1200 Vpeak	Zero Cross	8.5–30 Vdc (DC) 10–30 Vac (AC)	1500 A ² s	3.54 x 3.86 x 4.81 in. 89.8 x 98 x 122.2 mm
DR3P48A50	22A	24–520 Vrms	1200 Vpeak	Zero Cross	90–240 Vdc (DC) 90–240 Vac (AC)	1500 A ² s	

For RoHS Compliant contact factory.

THREE-PHASE AC SOLID-STATE RELAYS



Series C3P Three-Phase AC Solid-State Relays

Series C3P relays control medium amounts of power in three-phase applications. Optical isolation ensures complete protection of the C3P's control circuit from load transients. The compact plastic housing provides a low-cost alternative to large metallic three-phase contactors. The ceramic baseplate provides excellent thermal performance.

- Three-phase relay in a compact single-inline package
- High-temperature plastic housing
- Tight zero-cross window for low EMI
- Exposed ceramic baseplate for reduced thermal resistance

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
C3P24D25	25 Arms	24–280 Vrms	600 Vpeak	Zero Cross	10–30 Vdc	260 A ² s	3.2 x 1.09 x 0.32 in 81.9 x 27.7 x 8.3 mm
C3P24D25C	25 Arms	24–280 Vrms	600 Vpeak	Zero Cross	3.5–10 Vdc	260 A ² s	

Lead forming available upon request.



Series S3P Three-Phase AC Solid-State Relays

Series S3P relays are made up of three separate relays controlled by a common DC voltage control. They are designed to control 10A AC loads such as resistors and small motors on a mains from 12 to 440 Vac, either single- or three-phase. They are well suited for applications requiring compact size and low cost.

- Industry-standard hockey-puck package
- Spring connectors
- Three relays in a single package
- Zero-cross and random turn-on options
- RoHS Compliant available with option -/R

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
S3P44D10	10 Arms	12–440 Vrms	850 Vpeak	Zero Cross	4–30 Vdc	72 A ² s	2.3 x 1.75 x 1.14 in. 44.5 x 58.5 x 29 mm
S3P44R10	10 Arms	12–440 Vrms	850 Vpeak	Random	4–30 Vdc	72 A ² s	

See Appendix for heat-sink information and other options.
RoHS Compliant available with option: /R

QUAD-OUTPUT AC SOLID-STATE RELAYS



Series SQ Quad-Output AC Solid-State Relays

Series SQ relay provides four independent 25A relays in a standard hockey-puck package. The SQ package conserves space while providing high-power switching. The tight zero-cross window reduces the EMI level. Optical isolation ensures complete protection of the control circuit from load transients.

- Four solid-state relays in a hockey puck package
- Tight zero-cross window for low EMI
- Constant current input for low current draw
- High Immunity to surges
- RoHS Compliant available with option -/R

Part No.	Load Current	Load Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
SQ24D25	25 Arms	12–280 Vrms	600 Vpeak	Zero Cross	3–32 Vdc	288 A ² s	2.28 x 1.75 x 1.29 in. 58 x 44.5 x 33 mm
SQ24R25	25 Arms	12–280 Vrms	600 Vpeak	Random	4–30 Vdc	288 A ² s	

See Appendix for heat-sink information and other options.
RoHS Compliant available with option: /R

Teledyne now offers more than 800 solid-state relays and motor controllers for heating, lighting, motor control and packaging.

DC SOLID-STATE RELAYS



Series SH DC Solid-State Relays

Series SH relays offer high performance in a flexible, innovative package. They feature the latest-generation MOSFET technology as well as triggered control input to avoid linear control risks. The relays offer diagnostics, removable touch-proof terminal covers and a metal baseplate. They are up to 30% lighter than standard relays.

- Built-in diagnostics with status LED
- Ultra low on-state resistance
- Low output leakage current
- IP20 protection by terminal covers on load terminals
- No radiated or conducted disturbances

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
SH10DC40	40A	5–100 Vdc	100 Vpeak	20 µs	3.5–32 Vdc	30 mΩ	2.3 x 1.77 x 1.18 in. 58.5 x 45 x 30 mm
SH10DC40-16	40A	5–60 Vdc	100 Vpeak	20 µs	3.5–32 Vdc	30 mΩ	
SH20DC20-16	20A	5–110 Vdc	200 Vpeak	20 µs	3.5–32 Vdc	90 mΩ	
SH20DC40-16	40A	5–110 Vdc	200 Vpeak	20 µs	3.5–32 Vdc	46 mΩ	
SH75DC60-16	60A	5–40 Vdc	75 Vpeak	20 µs	3.5–32 Vdc	8.2 mΩ	

-16 = Internal protection

See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.



Series S20, S60 and S75 DC Solid-State Relays

Series S20 and S60 relays switch medium- to high-power DC loads. These devices feature the latest-generation MOSFET technology as well as an innovative isolated driver to ensure fast power turn on and off. The relays feature triggered control input to avoid linear control risks and fast switching times. The relays also offer an LED for status.

- Low on-state resistance
- Low output leakage current
- Low control current consumption
- Triggered control input to avoid linear control risks
- Low conducted and radiated disturbances

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
S20DC100	100A	0–130 Vdc	200 Vpeak	10 µs	4.5–32 Vdc	22 mΩ	2.29 x 1.75 x 1.1 in. 58.2 x 44.5 x 28 mm
S60DC40	40A	0–350 Vdc*	600 Vpeak	10 µs	4.5–32 Vdc	70 mΩ	
S20DC30	30A	0–130 Vdc	200 Vpeak	10 µs	4.5–32 Vdc	164 mΩ	
S75DC150	150A	0–48 Vdc	75 Vpeak	10 µs	4.5–32 Vdc	2.25 mΩ	

*275 Vrms size 20 varistor as protection across the output
See Appendix for heat-sink information and other options.
For RoHS Compliant contact factory.



Series LS10 DC Solid-State Relays

Series LS10 DC solid-state relays are designed for mounting on printed circuit boards. They facilitate heatsinking by providing an interface surface. They can switch loads with high starting currents. The nominal switched currents depend on the size of the heat sink. The relays use a direct-bonded copper substrate for thermal efficiency and long life.

- Slim compact design
- Heatsinking capabilities
- Integrated voltage protection
- High surge handling capability
- MOSFET output

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
LS60DC10C-21	10A	7–36 Vdc	60 Vpeak	20 µs	3–10 Vdc	20 mΩ	1.71 x 0.96 x 0.25 in. 43.6 x 24.5 x 6.3 mm
LS60DC10F-21	10A	7–36 Vdc	60 Vpeak	20 µs	7–30 Vdc	20 mΩ	

-21 = Self turn-on suppression
RoHS Compliant



RoHS Compliant

Series SDS Slim Single-Inline Package DC Solid-State Relays

The Series SDS slim single-inline package (SIP) relays save space on printed circuit boards. Designed for DC applications, they offer a 28Vdc 4A output and a 60Vdc 2.5A output. Several control ranges are available from 3 to 32Vdc. The low-cost plastic relays feature an integrated voltage clamp and high surge handling capability.

- Slim compact DC design
- Range for printed circuit board
- Integrated voltage clamp
- High surge handling capabilities
- Wide control range offerings

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
SDS32R4A	4A	0–32 V	60 Vpeak	20 µs	3–10 Vdc	120 mΩ	1.10 x 0.59 x 0.2 in. 28 x 15 x 5 mm
SDS32R4C	4A	0–32 V	60 Vpeak	20 µs	7–20 Vdc	120 mΩ	
SDS32R4K	4A	0–32 V	60 Vpeak	20 µs	18–32 Vdc	120 mΩ	
SDS60R2A	2.5A	0–60 V	60 Vpeak	20 µs	3–10 Vdc	200 mΩ	
SDS60R2C	2.5A	0–60 V	60 Vpeak	20 µs	7–20 Vdc	200 mΩ	
SDS60R2K	2.5A	0–60 V	60 Vpeak	20 µs	18–32 Vdc	200 mΩ	

RoHS Compliant



RoHS Compliant

Series DX DIN-Rail DC Solid-State Relays

Series DX relays are designed for DIN-rail mounting. These solid-state relays include a control LED that provides visual control status. Its compact size and user-friendly package make the Series DX relay an excellent choice for designers. The DX series relays offers long life versus mechanical relays.

- Solid-state relays for DIN-rail mounting
- Control visualization by LED
- AC/DC control
- High immunity to surges
- Compact design

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
DX22R1E-02	1A	2–220 V	220 Vpeak	20 µs	5–30 Vdc	1000 Ω	3.01 x 2.09 x 0.48 in. 76.4 x 53 x 12.2 mm
DX6R3E-02	3A	2–60 V	60 Vpeak	20 µs	3–30 Vdc	600 Ω	

RoHS Compliant



RoHS Compliant

Series DS Single-Inline Package DC Solid-State Relays

Series DS single inline package (SIP) four-pin relays are designed for mounting on printed circuit boards. The relays are designed for medium-power DC loads. The Series DS relay is an alternative to electromechanical and reed relays. The DS series relays offers a long life versus mechanical relays.

- Industry-standard package
- Surge tolerant
- Compact size
- Designed for medium-power DC loads
- Solid-state technology offering long life

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
DS6R3E	3A	2–60 V	60 Vpeak	200 µs	3–30 Vdc	1000 Ω	1.70 x 0.98 x 0.39 in. 43.2 x 25.4 x 10.2 mm
DS22R1E	1A	2–220 V	220 Vpeak	300 µs	3–30 Vdc	1000 Ω	

RoHS Compliant



Series TS



Series PS



RoHS Compliant

Series TS and Series PS DC Solid-State Relays

Series TS and Series PS relays provide AC/DC switching in a compact size. They also provide AC/DC control. These relays can withstand high surge currents. TS and PS relays are pin-to-pin compatible with electromechanical relays and may be used as replacements. Applications include inverting machines, lighting and fans.

- Compact size
- Pin-to-pin compatible with electromechanical relays
- AC and DC control; AC and DC output
- Random and zero-cross turn-on voltage
- High inrush capabilities

Part No.	Load Current	Load Voltage	Peak Voltage	Turn-On Time	Control Voltage	ON Resistance	Dimensions LxWxH
TS3R2G	2.5 Arms	0–30 Vdc	60 Vpeak	10 ms	12–30 Vdc	2100 Ω	1.14 x .50 x .62 in. 29 x 12.7 x 15.7 mm
TS3R1G	1 Arms	0–30 Vac/Vdc	60 Vpeak	50 µs	12–30 Vac/Vdc	2100 Ω	
PS3R5G	5 Arms	0–30 V	60 Vpeak	50 µs	12–30 Vdc	2100 Ω	1.14 x .50 x 1 in. 29 x 12.7 x 25.4 mm

RoHS Compliant

MOTOR CONTROLLERS



Series EMCRT Three-Phase Motor Reverser up to 7.5kW Motors

The Series EMCRT three-phase induction motor reverser can be used to turn on an industrial motor in either direction safely. It is designed to control and invert the direction of a three-phase motor. The reverser incorporates very-high-immunity components and can be mounted on a DIN rail or attached with screws.

- Controls and reverses three-phase motors without direct third leg (two legs)
- IP20 touch-proof housing
- Built-in snubber and MOV
- Forward/Reverse display LED

Part No.	Motor Current	Mains Voltage	Peak Voltage	Switch Type	Control Voltage	I ² t	Dimensions LxWxH
EMCRT48D50	8.5A	24–520 Vac	1600 Vpeak	Zero Cross	12–30 Vdc	1500 A ² s	3.94 x 2.99 x 2.22 in.
EMCRT48D75	16A	24–550 Vac	1600 Vpeak	Zero Cross	12–30 Vdc	5000 A ² s	100 x 76 56.5 mm

For RoHS Compliant contact factory.



EMC48S50-01

Series EMC Soft-Start Motor Controller up to 26kW Motors

The Series EMC motor controllers provide an alternative to costly and large variable speed controllers in pumps, fans, compressors and conveyors. Its six-thyristor structure, working like a full-wave phase angle controller, reduces the induction motor starting current as well as the motor starting torque to improve the efficiency of the power used.

- Controls both positive and negative cycles
- Avoids voltage fluctuations that lead to flicker
- Fits existing applications without modification of the wiring field configuration
- Features diagnostic and self-test functions

MAINS CHARACTERISTICS										
Part No.	Max. Motor Power @40°C				IAC53a @40°C		Phase to Phase Voltage	Mains Frequency	Input	Operating Temperature
	Star (Y)		Delta (D)		Max.	EN60947-4-2				
	400Vac	230Vac	400Vac	230Vac						
EMC48S50-01	2.2kW	1.3kW	3.8kW	2.2kW	5A	3.5A	200 to 480Vac	40 to 65Hz	10 to 24Vdc	−40°C to +100°C
EMC48S50-02	7.5kW	4.3kW	13kW	7.5kW	16A	11.5A				
EMC48S50-03	11kW	6.4kW	19kW	11kW	22A	15.5A				
EMC48S50-04	15kW	8.6kW	26kW	15kW	30A	22.5A				

For RoHS Compliant contact factory.



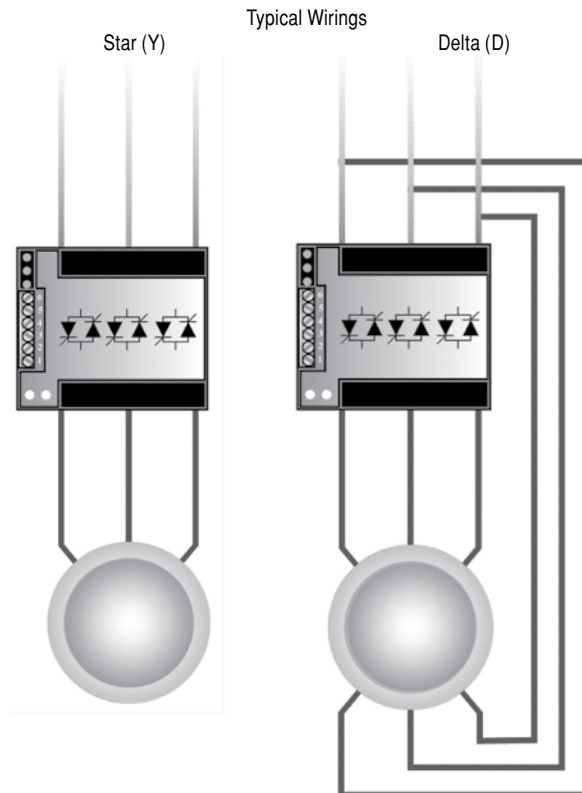
EMC48S50-02



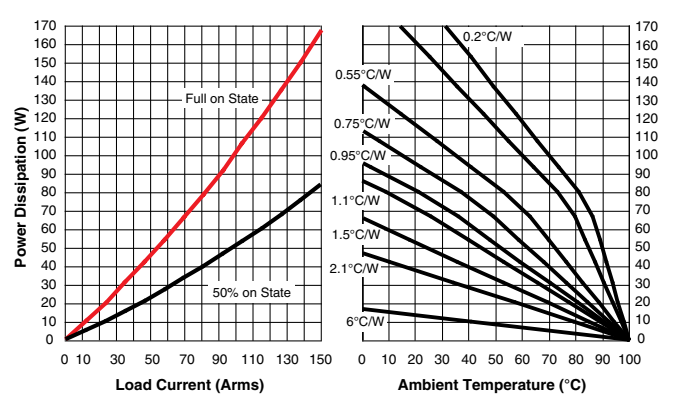
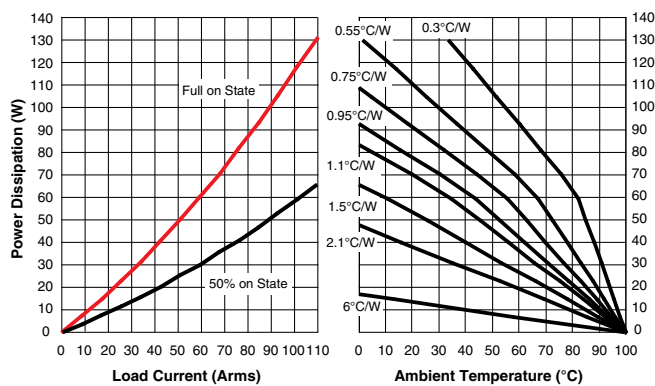
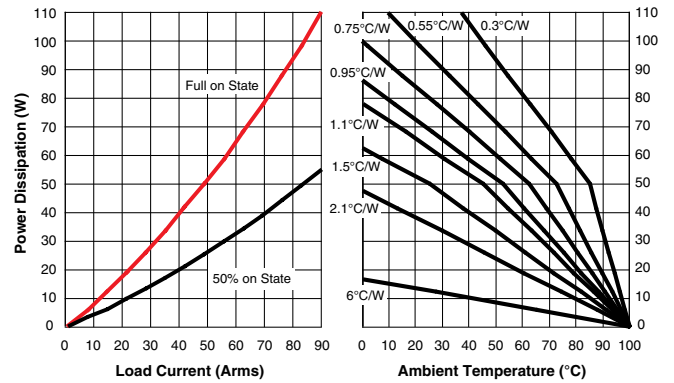
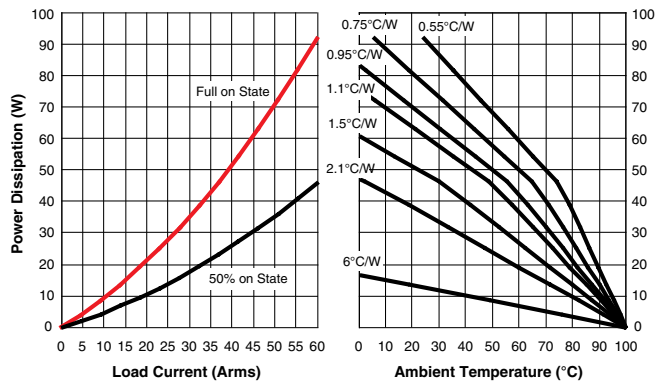
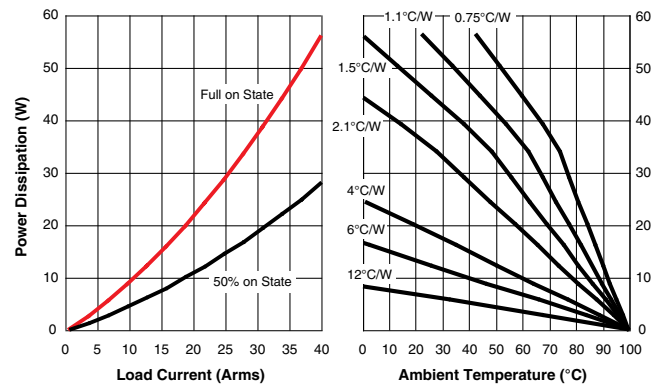
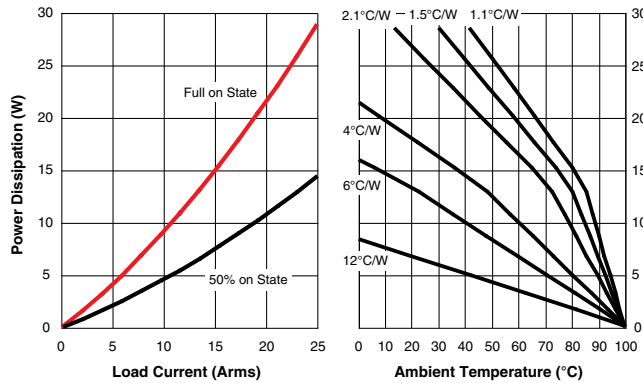
EMC48S50-03



EMC48S50-04



Thermal Curves for Single-Phase, Hockey-Puck Solid-State Relays



NOTES:

Curves for single-phase, hockey-puck solid-state relays. View data sheets online at www.teledynereleys.com for additional models.

12°C/W corresponds to a relay without heat sink

6°C/W corresponds to a relay mounted on a DIN-rail adaptor (Teledyne P/N DL12)

Hockey Puck Relay Options



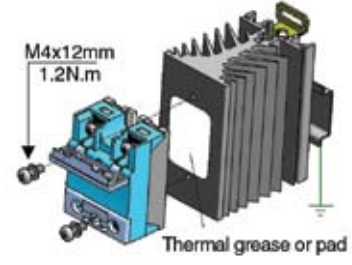
2–2.5°C/W
Teledyne P/N FW151



.1°C/W
Teledyne P/N FW108



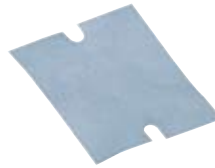
0.3°C/W
Teledyne P/N FW031



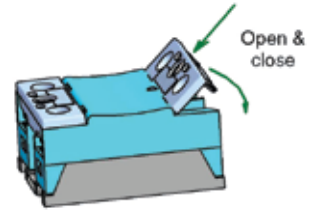
DIN Rail Adapter
Teledyne P/N DL12

Mounting

Most SSRs must be mounted on heat sinks. A large range of heat sinks is available. For heat-sink mounting, use thermal grease or a thermal pad with high conductivity specified by Teledyne. See our website for additional heat sinks.



Thermal Pad
Teledyne P/N –12



Removable IP20 touch-proof
terminal covers on HIPpak

Typical Loads (Random)

HIPpak relays with random turn-on are designed for high inductive loads or phase angle control applications.

Our data sheet lists nominal current of power thyristors corresponding to a resistive load (AC-51).

Depending on the loads, check the inrush current at turn ON and possible overvoltages at turn OFF.

Main applications:

- AC-55b — Incandescent or infrared lamps. Inrush current is generally 10 times I_n during few 10ms. Random relays often use in-phase angle controllers or soft-starters with the right control.
- AC-53 — Three-phase motors. 2 or 3 random turn-on relays can drive such motors.
- AC-56a — Transformer loads. Very high inrush current up to 100 times I_n . Use a random turn-on SSR like the SH.

The table below lists recommended current values for proper lifetime expectancy.

Typical Loads (Zero-Cross)

HIPpak relays with zero-cross turn-on are designed for most types of loads.

Our data sheet lists the AC-51 current value corresponding to resistive loads.

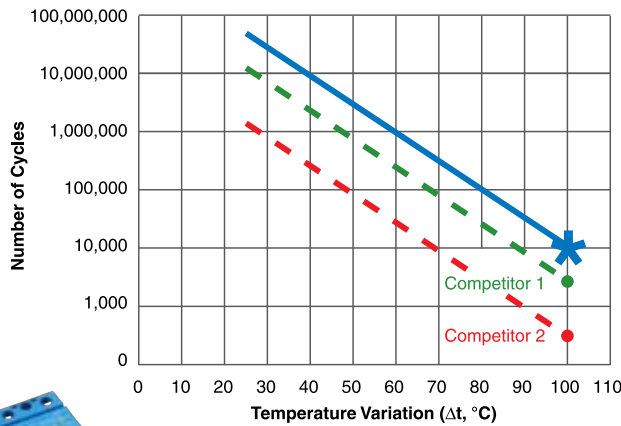
For other loads, check the inrush current at turn ON and possible overvoltages at turn OFF:

- AC-55b — Incandescent lamps. Inrush current is generally 10 times I_n during few 10ms.
- AC-55a — Electric discharge lamp. These loads often have overcurrent at turn ON and overvoltage at turn OFF, so use 400VAC SSR on 230VAC mains.
- AC-58 — One-pole motors. These loads often have overcurrent at turn ON and overvoltage at turn OFF, so use 400VAC SSR on 230VAC mains and adapt the SSR current to the starting current of the motor.
- AC-53 — Three-phase motors. 2 or 3 SH zero-cross relays can drive these motors, but generally use E3P/E3PT or other three-phase relays or SH random range.
- AC-56a — Transformer loads. Very high inrush current up to 100 times I_n . Use SH random relay or peak control SSR.
- AC-56b — Capacitor loads with very high current at turn ON and overvoltage at turn OFF. Our high-voltage relays are well adapted for high inrush current.

SSR Model	AC-53 Current (motor)	AC-55b Current (lamp)	AC-55b Current (transformer)	AC-55b Current (capacitor)
12A	2.5A	2.5A	0.4A	XXX
25A	5A	5A	1A	XXX
35A	9A	9A	2A	XXX
50A	12A	12A	3A	13A
75A	16A	16A	6A	24A
95A	24A	24A	9A	36A
125A	32A	32A	12A	48A

Power Solid-State Relays Proven · Rugged · Reliable

Reliability / Thermal Cycling Results



* Teledyne HIPpak relay
versus competitive 50A relays

With more than 40 years of proven experience, Teledyne Relays delivers solutions second to none with features like built-in touch-proof covers, built-in heat sinks, miniature solutions, large I^2t values for higher reliability, tight zero-cross window for less noise and lower in-rush currents. Our rugged design offers up to 2000A surge capability and excellent thermal characteristics.



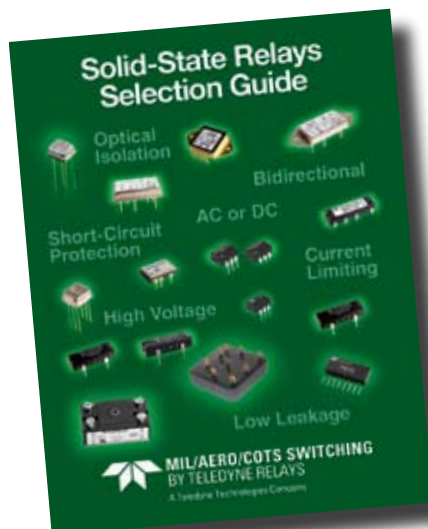
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<http://www.teledynereleys.com/lit-request.asp>



APPENDIX: Authorized Distributors

NORTH AMERICA

ALLIED ELECTRONICS

Tel: (800) 433-5700
www.alliedelec.com/search.asp

ASAP ELECTRONICS

Tel: (800) 477-1272
www.asapelectronics.com

AVNET

Tel: (800) 772-8638
www.em.avnet.com

MASTER DISTRIBUTORS

Tel: (888) 473-5297
www.onlinecomponents.com

MOUSER ELECTRONICS

Tel: (800) 346-6873
www.mouser.com

RICHARDSON ELECTRONICS

Tel: (800) 737-6937
www.rell.com

SHERBURN ELECTRONICS

Tel: (800) 366-3066
www.sherburn.com

BELGIUM & LUXEMBOURG

Nijkerk Electronics B.V.

Tel: +32 (0) 3 544 7066
E-mail: alain.huysmans@nijkerk.be
www.nijkerk-ne.com

CHINA & HONG KONG

Fiaco Microelectronics

Beijing Office
Tel: 86-10-6503-2171
E-mail: beijing@fiaco.com

Bright Toward Industrial Co., Ltd.

Beijing Office
Tel: 86-10-8200-4979
E-mail: linden_wang@toward.com.cn

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www.amtek.cz

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E-mail: jbh@arrownordic.com
www.arrowne.com

ESTONIA

ARROW Estonia

Tel: +372 6 774250
E-mail: estonia@arrownordic.com
www.arrowne.com

FINLAND

ARROW Finland Oy

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www.arrowne.com

FRANCE

ARROW France

Tel: +33 1 4978 4960
E-mail: ralves@arrowfrance.com

GERMANY

Adelco Elektronik GmbH

Tel: +49 (0) 4106 61040
E-mail: adelco@t-online.de
www.adelco-elektronik.de

Hot Electronic GmbH

Tel: +49 (0) 89 666 2836
E-mail: info@hot-electronic.de
www.hot-electronic.de

MRC Components oHG

Tel: +49 (0) 8161 98480
E-mail: info@mrccomponents.de
www.mrccomponents.de

Zettler electronics GmbH

Tel: +49 (0) 89 800 97-0
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www.zettlerelectronics.com

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E-mail: karthik@spectraus.com

Specsynergy Technologies, Inc.

New Delhi Office
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E-mail: malik@specsynergytech.com

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STG International Ltd.

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E-mail: davidb@stggroup.co.il
www.stggroup.co.il

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Tel: +39 02 95384218
E-mail: ermanno.baschieri@sincron.it
www.sincron.it

JAPAN

Comcraft Corporation Tokyo

Tel: 81-3-3395-5553
E-mail: trcsales@comcraft.co.jp
www.comcraft.co.jp

Comcraft Corporation Osaka

Tel: 81-6-6396-7722
E-mail: trcsales@comcraft.co.jp
www.comcraft.co.jp

KOREA

Electro-Comm USA

Tel: (818) 848-7790
E-mail: briansong@anyeparts.com
www.anyeparts.com

Electro-Comm SEOUL

Tel: 82-31-713-4216
E-mail: tony_jang@anyeparts.com
www.anyeparts.com

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ARROW Latvia

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E-mail: latvia@arrownordic.com
www.arrowne.com

LITHUANIA

ARROW Lithuania

Tel: +370-37-759015
E-mail: lithuania@arrownordic.com
www.arrowne.com

MALAYSIA

Device Electronics PTE, Ltd.

Tel: (603) 7880 8626/8636
E-mail: ngthomas@devicelect.com

NETHERLANDS

Nijkerk Electronics B.V.

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E-mail: alain.huysmans@nijkerk.be
www.nijkerk-ne.com

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ARROW Norway A/S

Tel: +47 (0) 21306532
E-mail: stondevoidshagen@arrownordic.com
www.arrowne.com

RUSSIA

Petersburg Electronic Company JSC

Tel: +7 812 4488 777
E-mail: dkizha@pec.spb.ru
www.pec.spb.ru

SINGAPORE

Device Electronics PTE, Ltd.

Tel: 65-288 6455
E-mail: ngthomas@devicelect.com

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RF Design

Tel:
National Smart Call: 0861 753 357
Cape Town: +27 (0) 21 555 8400
Gauteng: +27 (0) 11 695 2200
Durban: +27 (0) 31 266 4534
www.rfdesign.co.za

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Tel: +46 8 56265500
E-mail: aekstrom-wirth@arrownordic.com
www.arrowne.com

MicroComp Nordic AB

Tel: +46 8 607 3910
E-mail: info@microcomp-nordic.se
www.mcnaab.se

OEM Electronics

Tel: +46 75 242 4562
E-mail: ulf.nygren@oemelectronics.se
www.oemelectronics.se

SWITZERLAND

ENA AG

Tel: +41 56 6342834
E-mail: rolf.hochstrasser@ena.ch
www.ena.ch

TAIWAN

Bright Toward Industrial Co., Ltd.

Tel: +886-2-822-76000
E-mail: philip@relays.com.tw
www.relays.com.tw

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Advanced Power Components plc

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E-mail: angiep@apc-plc.co.uk
www.apc-plc.co.uk

Arrow Electronics UK Ltd.

Tel: +44 (0) 1279 626 777
www.arrowne.com

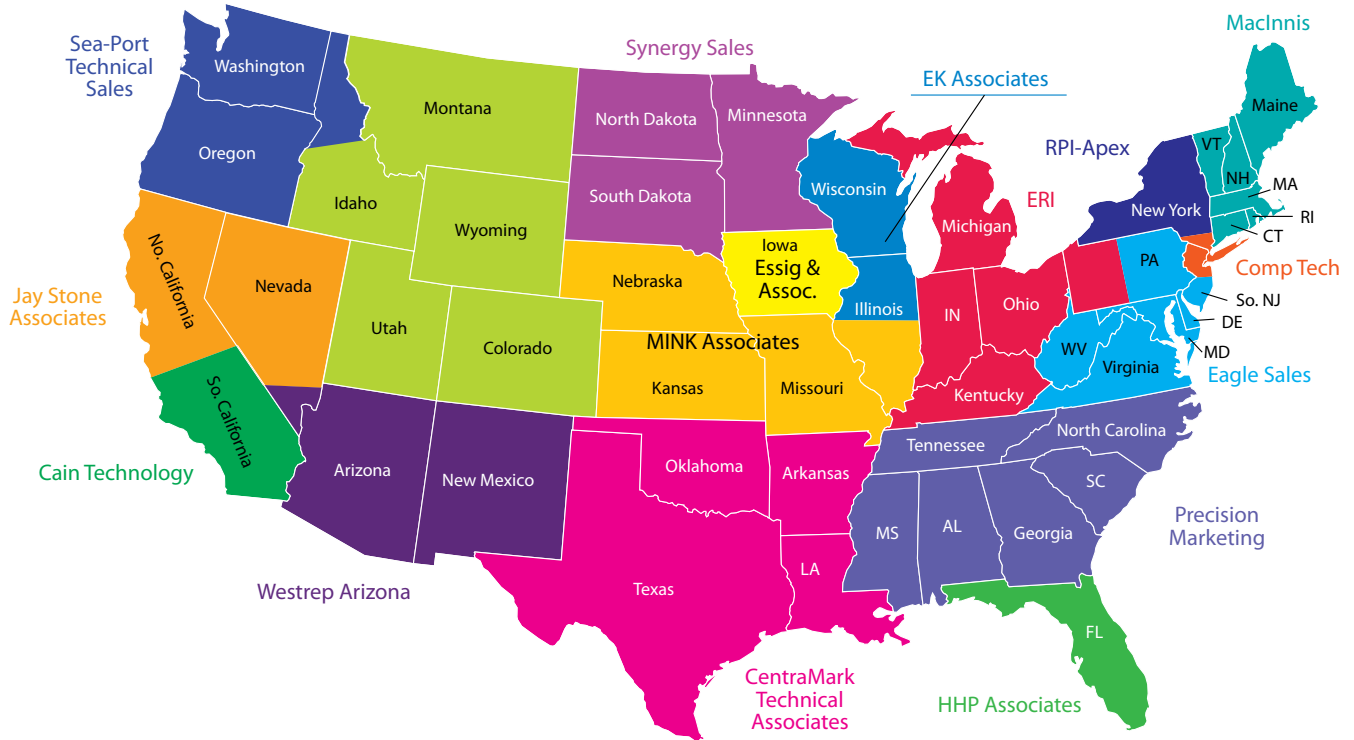
Willow Technologies Ltd.

Tel: +44 (0) 1342 835 234
E-mail: sales@willow.co.uk
www.willow.co.uk

2001 Electronic Components Ltd.

Tel: +44 (0) 1438 742 001
E-mail: sales@2001elec.co.uk
www.2001elec.co.uk

APPENDIX: Authorized North American Representatives



REPRESENTATIVES

Cain Technology

Southern California
2629 Townsgate Road, Suite 200
Westlake Village, CA 91361
Tel: 805-496-5702
Fax: 805-496-6702
www.caintech.com

Cee-Jay Micro Ltd.

Eastern Canada
155 Terence Matthews Crescent
Unit 2
Kanata, Ontario
Canada K2M 2A8
Tel: 613-599-5626
www.cjmicro.com

CentraMark Technical Sales Associates

TX, OK and LA
3333 Naaman School Road
Garland, TX 75040
Tel: 972-414-8188
Fax: 972-414-6788
www.cmatex.com

Comp-Tech Sales

Northern New Jersey, Metro New York, Long Island
232 Boulevard, Suite 11
Hasbrouck Heights, NJ 07604
Tel: (201) 288-7400
Fax: (201) 288-7583
www.comp-techsales.com

Eagle Sales Corporation

MD, VA, WA DC, Eastern PA, Southern NJ
3545 Ellicott Mills Drive, Suite 202
Ellicott City, MD 21043
Tel: (410) 203-2317
Fax: (410) 203-2318
www.eaglesales.net

EK & Associates, Inc.

IL, WI
887 E. Wilmette Road, Suite J
Paltine, IL 60074
Tel: 847-776-1758
Fax: 847-776-8221
www.ekrep.com

Electronic Representatives, Inc.

IN, OH, MI, KY, West PA
6801 Lake Plaza Drive, Suite D402
Indianapolis, IN 46220
Tel: (317) 915-1414
Fax: (317) 915-1216
www.electronicreps.com

Essig & Associates, Inc.

Iowa
809 N. Compton Drive
Hiawatha, IA 52233
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