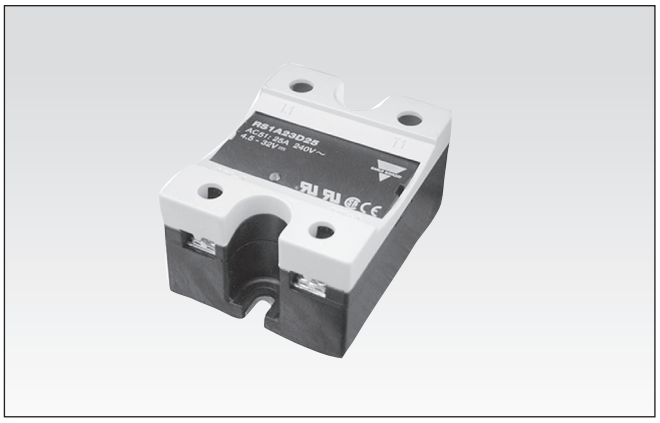
Solid State Relays
Industrial, 1-Phase ZS w. LED
Types RS 23, RS 40, RS 48



- **Zero switching AC Solid State Relay**
- **Direct copper bonding (DCB) technology in 25 A and 40 A types**
- **LED indication**
- **Clip-on IP 20 protection cover**
- **Self-lifting terminals**
- **Housing free of moulding mass**
- **2 input ranges: 4-32 VDC and 18-36 VAC/VDC**
- **Operational ratings up to 40 AACrms and 480 VAC**
- **Blocking voltage: Up to 1200 V_p**
- **Opto-isolation: > 4000 VACrms**
- **Integrated snubber network in 25 A and 40 A types**

Product Description

The zero switching relay with triac (10 A) or thyristor output (25 A, 40 A) offer a solution for resistive load switching. The zero switching relay switches ON when the sinusoidal voltage crosses zero and switches OFF when the current crosses zero. The LED indicates the status of the control input. The clip-on cover is securing touch protection to IP 20. Output terminals can handle cables up to 16 mm^2.

Ordering Key

RS 1 A 23 D 25

- **Solid State Relay**
- **Number of poles**
- **Switching mode**
- **Rated operational voltage**
- **Control voltage**
- **Rated operational current**

Type Selection

Switching mode	Rated operational voltage	Rated operational current	Control voltage
A: Zero Switching	23: 230 VACrms 40: 400 VACrms 48: 480 VACrms	10: 10 AACrms 25: 25 AACrms 40: 40 AACrms	LA: 18 to 36 VAC/VDC D: 3 to 32 VDC* *4 to 32 VDC for 400 VAC and 480 VAC types

Selection Guide

Rated operational voltage	Blocking voltage	Control voltage	Rated operational current 10 A	25 A	40 A
230 VACrms	650 V_p	3-32 VDC	RS1A23D10	RS1A23D25	RS1A23D40
		18-36 VAC/DC	RS1A23LA10	RS1A23LA25	RS1A23LA40
400 VACrms	800 V_p	4-32 VDC	RS1A40D10	RS1A40D25	RS1A40D40
		18-36 VAC/DC	RS1A40LA10	RS1A40LA25	RS1A40LA40
480 VACrms	1200 V_p	4-32 VDC	RS1A48D10	RS1A48D25	RS1A48D40
		18-36 VAC/DC	RS1A48LA10	RS1A48LA25	RS1A48LA40

General Specifications

	RS1A23...	RS1A40...	RS1A48...
Operational voltage range	42 to 265 VACrms	42 to 440 VACrms	42 to 530 VACrms
Blocking voltage	≥ 650 V_p	≥ 800 V_p	≥ 1200 V_p
Zero voltage turn-on	≤ 15 V	≤ 15 V	≤ 15 V
Operational frequency range	45 to 65 Hz	45 to 65 Hz	45 to 65 Hz
Power factor	≥ 0.95 @ 230 VACrms	≥ 0.95 @ 400 VACrms	≥ 0.95 @ 480 VACrms
Approvals	UR, cUR, CSA, EAC	UR, cUR, CSA, EAC	UR, cUR, CSA, EAC
CE-marking	Yes	Yes	Yes
UKCA-marking	Yes	Yes	Yes

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Input Specifications

	RS1A..D..	RS1A..LA...
Control voltage		18-36 VAC/DC
RS1A23..,	3-32 VDC	
RS1A40.., RS1A48..	4-32 VDC	
Pick-up voltage		≤ 18 VAC/DC
RS1A23..,	≤ 2.75 VDC	
RS1A40.., RS1A48..	≤ 3.75 VDC	
Reverse voltage	≤ 32 VDC	-
Drop out voltage	≥ 1.2 VDC	≥ 5 VAC/DC
Input current @ max input voltage	≤ 12 mA	≤ 15 mA
Response time pick-up	≤ 1/2 cycle	≤ 1 cycle
Response time drop-out	≤ 1/2 cycle	≤ 2 cycles

Output Specifications

	RS1A...10	RS1A...25	RS1A...40
Rated operational current			
AC51 @ Ta=25°C	10 Arms	25 Arms	40 Arms
Min. operational current			
RS1A23.., RS1A40..	65 mA	150 mA	250 mA
RS1A48..	150 mA	150 mA	250 mA
Rep. overload current t=1 s	< 12 AACrms	< 55 AACrms	< 125 AACrms
Non-rep. surge current t=10 ms			
RS1A23.., RS1A40..	100 A_p	325 A_p	600 A_p
RS1A48..	325 A_p	325 A_p	600 A_p
Off-state leakage current @ rated voltage and frequency	< 3 mArms	< 3 mArms	< 3 mArms
I^2t for fusing t=10 ms			
RS1A23.., RS1A40..	≤ 50 A^2s	≤ 525 A^2s	≤ 1800 A^2s
RS1A48..	≤ 525 A^2s	≤ 525 A^2s	≤ 1800 A^2s
On-state voltage drop @ rated current	≤ 1.6 Vrms	≤ 1.6 Vrms	≤ 1.6 Vrms
Critical dV/dt off-state	≥ 500 V/µs	≥ 500 V/µs	≥ 500 V/µs

Thermal Specifications

	RS1A...10	RS1A...25	RS1A...40
Operating temperature	-20° to 70°C	-20° to 70°C	-20° to 70°C
Storage temperature	-40° to 100°C	-40° to 100°C	-40° to 100°C

Housing Specifications

Weight	Approx. 60 g
Housing material	Noryl GFN 1, black
Baseplate	Aluminium
Potting compound	None
Relay	
Mounting screws	M5
Mounting torque	1.5-2.0 Nm
Control terminal	
Mounting screws	M3 x 9
Mounting torque	0.5 Nm
Power terminal	
Mounting screws	M5 x 9
Mounting torque	2.4 Nm

Isolation

Rated isolation voltage Input to output	≥ 4000 VACrms
Rated isolation voltage Output to case	≥ 4000 VACrms

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Electromagnetic Compatibility

Immunity	EN60947-4-3
Electrostatic Discharge (ESD)	
Immunity	IEC/EN 61000-4-2
Air discharge, 8kV	Performance Criteria 2
Contact, 4kV	Performance Criteria 2
Electrical Fast Transient	
(Burst) Immunity	IEC/EN 61000-4-4
Output: 2kV, 5kHz	Performance Criteria 2
Input: 1kV, 5kHz	Performance Criteria 2
Electrical Surge Immunity	IEC/EN 61000-4-5
Output, line to line, 1kV	Performance Criteria 2
Output, line to earth, 1kV	Performance Criteria 2
Output, line to earth, 2kV	Performance Criteria 2 with external varistor
Input, line to line, 1kV	Performance Criteria 2
Input, line to earth, 2kV	Performance Criteria 2

Radiated Radio Frequency	
Immunity	IEC/EN 61000-4-3
10V/m, 80 - 1000 MHz	Performance Criteria 1
10V/m, 1.4 - 2.0GHz	Performance Criteria 1
3V/m, 2.0 - 2.7GHz	Performance Criteria 1
Conducted Radio Frequency	
Immunity	IEC/EN 61000-4-6
10V/m, 0.15 - 80MHz	Performance Criteria 1
Voltage Dips Immunity	IEC/EN 61000-4-11
0% for 0.5, 1 cycle	Performance Criteria 2
40% for 10 cycles	Performance Criteria 2
70% for 25 cycles	Performance Criteria 2
80% for 250 cycles	Performance Criteria 2
Voltage Interruptions Immunity	IEC/EN 61000-4-11
0% for 5000ms	Performance Criteria 2

EMC Emission	EN60947-4-3
Radio Interference	
Voltage Emission (Conducted)	IEC/EN 55011
0.15 - 30MHz	Class A (industrial) with filters IEC/EN 60947-4-3 Class A (no filtering needed up to 75AAC)

Radio Interference	
Field Emission (Radiated)	IEC/EN 55011
30 - 1000MHz	Class B

Notes:

- Use of AC solid state relays may, according to the application and the load current, cause conducted radio interferences. Use of mains filters may be necessary for cases where the user must meet E.M.C requirements. The capacitor values given inside the filtering specification tables should be taken only as indications, the filter attenuation will depend on the final application.
- Control input lines must be installed together to maintain products' susceptibility to Radio Frequency interference.

- Performance Criteria 1: No degradation of performance or loss of function is allowed when the product is operated as intended.
- Performance Criteria 2: During the test, degradation of performance or partial loss of function is allowed. However, when the test is complete the product should return operating as intended by itself.
- Performance Criteria 3: Temporary loss of function is allowed, provided the function can be restored by manual operation of the controls.

Heatsink Dimensions (load current versus ambient temperature)

RS1A23..10, RS1A40..10

Load current [A]	Thermal resistance [°C/W]						Power dissipation [W]
10.0	3.34	2.58	1.81	1.04	0.27	-	13.0
9.0	4.25	3.37	2.49	1.61	0.73	-	11.3
8.0	5.41	4.38	3.36	2.33	1.31	0.28	9.7
7.0	6.92	5.70	4.49	3.27	2.06	0.84	8.2
6.0	8.96	7.49	6.02	4.55	3.08	1.61	6.8
5.0	11.9	10.0	8.19	6.36	4.53	2.69	5.5
4.0	16.2	13.9	11.5	9.10	6.72	4.34	4.2
3.0	23.7	20.3	17.0	13.7	10.4	7.12	3.0
2.0	38.6	33.4	28.3	23.1	17.9	12.7	1.9
1.0	-	-	-	-	-	29.7	0.9
	20	30	40	50	60	70	T_A

Ambient temp. [°C]

RS1A48..10, RS..25

Load current [A]	Thermal resistance [°C/W]							Power dissipation [W]
25.0	3.23	2.80	2.37	1.94	1.51	1.09	0.66	23
22.5	3.70	3.21	2.73	2.24	1.75	1.26	0.78	21
20.0	4.30	3.74	3.17	2.61	2.05	1.49	0.92	18
17.5	5.07	4.41	3.76	3.10	2.44	1.78	1.12	15
15.0	6.12	5.33	4.54	3.75	2.96	2.17	1.38	13
12.5	7.58	6.61	5.64	4.66	3.69	2.72	1.75	10
10.0	9.80	8.55	7.30	6.05	4.80	3.55	2.30	8
7.5	13.5	11.80	10.09	8.37	6.66	4.94	3.23	6
5.0	-	18.3	15.7	13.04	10.39	7.74	5.09	4
2.5	-	-	-	-	-	16.2	10.7	2
	20	30	40	50	60	70	80	T_A

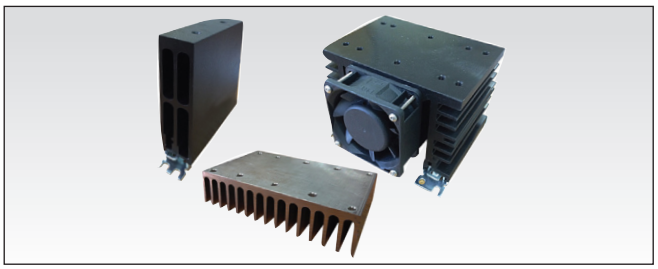
Ambient temp. [°C]

RS....40

Load current [A]	Thermal resistance [°C/W]							Power dissipation [W]
40	1.73	1.49	1.25	1.01	0.77	0.52	0.28	41
36	2.00	1.73	1.45	1.18	0.90	0.63	0.35	36
32	2.35	2.03	1.71	1.39	1.08	0.76	0.44	31
28	2.80	2.43	2.05	1.68	1.30	0.93	0.55	27
24	3.41	2.96	2.51	2.05	1.60	1.15	0.70	22
20	4.26	3.71	3.15	2.59	2.03	1.47	0.92	18
16	5.56	4.84	4.12	3.40	2.68	1.96	1.24	14
12	7.74	6.74	5.75	4.76	3.77	2.78	1.78	10
8	12.12	10.58	9.04	7.50	5.96	4.42	2.88	6
4	-	-	-	15.74	12.56	9.37	6.18	3
	20	30	40	50	60	70	80	T_A

Ambient temp. [°C]

Heatsink Selection



Ordering Key

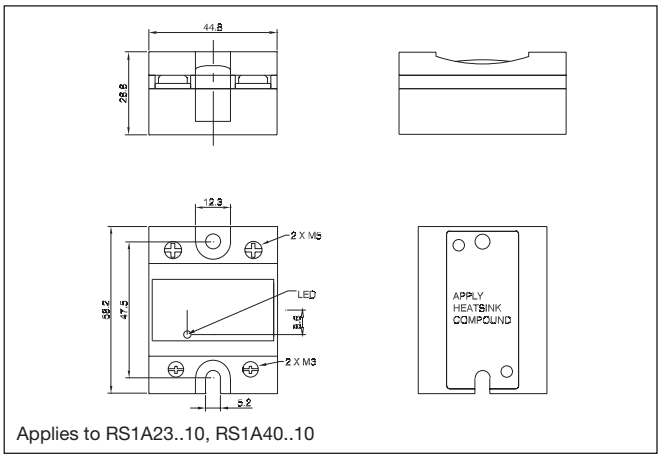
RHS..

- Heatsinks and fans
- 5.40°C/W to 0.12°C/W thermal resistance
- DIN, panel or thru wall mounting
- Single or multiple SSR mounting

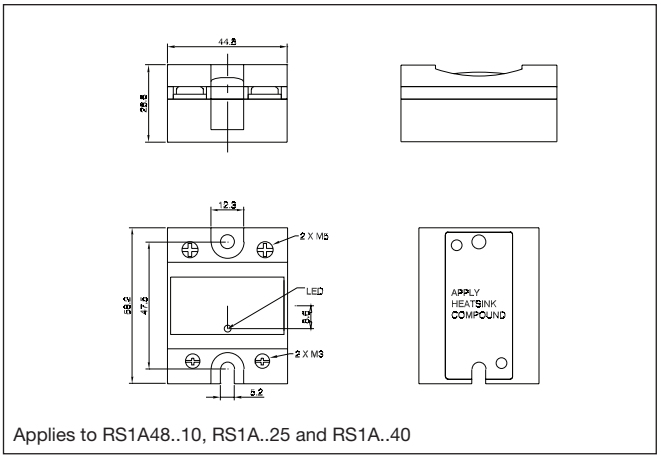
Heatsink Range Overview:
https://gavazziautomation.com/images/PIM/DATASHEET/ENG/SSR_Accessories.pdf

Heatsink Selector Tool:
https://gavazziautomation.com/nsc/HQ/EN/solid_state_relays

Dimensions



Applies to RS1A23..10, RS1A40..10

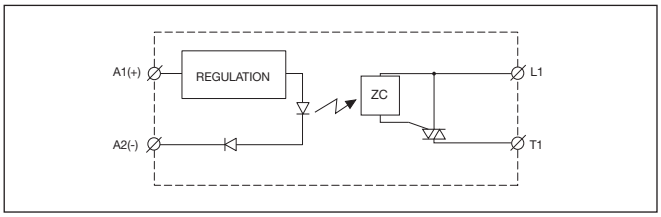


Applies to RS1A48..10, RS1A..25 and RS1A..40

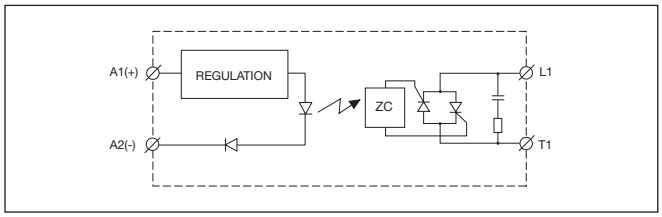
All dimensions in mm.

Functional Diagram

DC Control Voltage

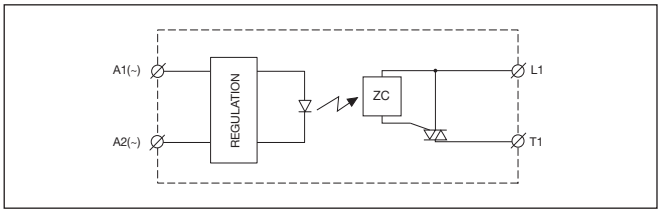


Note: Applies only to RS1A23D10, RS1A40D10

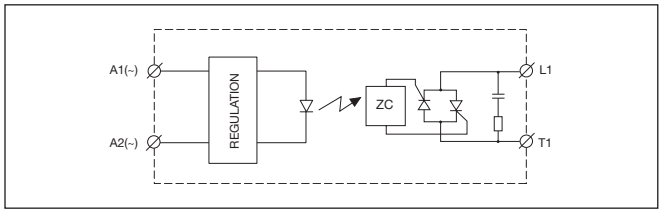


Note: Applies only to RS1A48D10, RS1A..D25, RS1A..D40

AC Control Voltage



Note: Applies only to RS1A23LA10, RS1A40LA10



Note: Applies only to RS1A48LA10, RS1A..LA25, RS1A..LA40

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Environmental Information

The declaration in this section is prepared in compliance with People's Republic of China Electronic Industry Standard SJ/T11364-2014: Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products.

Part Name	Toxic or Harardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(Vl))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Power Unit Assembly	x	O	O	O	O	O
O: Indicates that said hazardous substance contained in homogeneous materials fot this part are below the limit requirement of GB/T 26572. X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.						

环境特性

这份申明根据中华人民共和国电子工业标准
SJ/T11364-2014：标注在电子电气产品中限定使用的有害物质

零件名称	有毒或有害物质与元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(Vl))	多溴化联苯 (PBB)	多溴联苯醚 (PBDE)
功率单元	x	O	O	O	O	O
O:此零件所有材料中含有的该有害物低于GB/T 26572的限定。 X: 此零件某种材料中含有的该有害物高于GB/T 26572的限定。						

Faston terminals

- Fast-on tabs
- Tab dimensions according to DIN 46342 part 1
- Pure tin-plated brass

Ordering Key

Screw mounted Faston terminals **RS1A48D25 | F 4**

RS, RM Solid State Relay
Faston terminals
Tab orientation
Input Tab width: 4.8mm
Output Tab width: 6.3mm

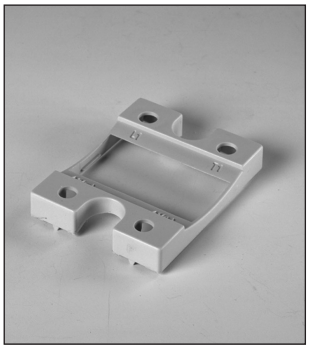
Faston terminals in packs of 20 **RM48** ** **| F 4**

RS, RM Solid State Relay
Tab orientation

* 0: Flat (0°)
4: Angled (45°)

** 48: 4.8mm faston for input
63: 6.3mm faston for output

Other Accessories



- Touch safety cover
- Type RMIP20
- IP20 protection degree
- Pack size: 20 pieces

All accessories can be ordered pre-assembled with Solid State Relays.
Other accessories include DIN rail adaptors, varistors and spacers.
For futher information refer to Accessories datasheets.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

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RS1A23D40 RS1A23LA10 RS1A23D25 RS1A48D40 RS1A48D25 RS1A23D10 RS1A40D25 RS1A40D40 RS1A23A1-40