

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
- 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
- Non-repetitive voltage: Up to 1200 V_p
- Opto-insulation: > 4000 VACrms
- Integrated snubber network in 25 A and 40 A types

Product Description

The zero switching relay with triac (10 A) or alternistor output (25 A, 40 A) is an inexpensive solution for resistive loads. 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 mm².

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 480VAC types

Selection Guide

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			10 A	25 A	40 A
230 VACrms	650 V _p	3-32 VDC 18-36 VAC/DC	RS1A23D10 RS1A23LA10	RS1A23D25 RS1A23LA25	RS1A23D40 RS1A23LA40
400 VACrms	850 V _p	4-32 VDC 18-36 VAC/DC	RS1A40D10 RS1A40LA10	RS1A40D25 RS1A40LA25	RS1A40D40 RS1A40LA40
480 VACrms	1200 V _p	4-32 VDC 18-36 VAC/DC	RS1A48D10 RS1A48LA10	RS1A48D25 RS1A48LA25	RS1A48D40 RS1A48LA40

General Specifications

	RS1A23...	RS1A40...	RS1A48...
Operational voltage range	42 to 265 VACrms	42 to 440 VACrms	42 to 530 VACrms
Non-rep. peak voltage	≥ 650 V _p	≥ 850 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	UL, cUL, CSA	UL, cUL, CSA	UL, cUL, CSA
CE-marking (external filter for EN 61000-6-4 needed)	Yes	Yes	Yes

Input Specifications

	RS1A..D..	RS1A..LA...
Control voltage RS1.23.. RS1.40.. RS1.48..	3-32 VDC 4-32 VDC	18-36 VAC/DC
Pick-up voltage RS1.23.. RS1.40.. RS1.48..	≤ 2.75 VDC ≤ 3.75 VDC	≤ 18 VAC/DC
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	150 mA	150 mA	150 mA
Rep. overload current t=1 s	< 12 AACrms	< 37 AACrms	< 60 AACrms
Non-rep. surge current t=10 ms	100 A _p	300 A _p	390 A _p
Off-state leakage current @ rated voltage and frequency	< 3 mArms	< 3 mArms	< 3 mArms
I²t for fusing t=1-10 ms	≤ 50 A ² s	≤ 450 A ² s	≤ 760 A ² s
Critical di/dt	≥ 10 A/μs	≥ 50 A/μs	≥ 50 A/μs
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

Insulation

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

Heatsink Dimensions (load current versus ambient temperature)

RS10.

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	
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

T_A
Ambient temp. [°C]

Junction to ambient thermal resistance, $R_{th\ j-a}$	< 40.0	K/W
Junction to BTB tab thermal resistance, $R_{th\ j-t}$	< 2.00	K/W
BTB tab to case thermal resistance, $R_{th\ t-s}$	< 2.60	K/W
Case to heatsink thermal resistance, $R_{th\ c-s}$	< 0.20	K/W
Maximum allowable BTB case temperature	100	deg.C
Maximum allowable junction temperature	100	deg.C

RS25.

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	
25.0	2.31	1.96	1.62	1.28	0.93	0.59	29
22.5	2.85	2.45	2.06	1.66	1.27	0.87	25
20.0	3.49	3.03	2.56	2.10	1.64	1.18	22
17.5	4.17	3.63	3.08	2.53	1.99	1.44	18
15.0	5.11	4.44	3.78	3.12	2.45	1.79	15
12.5	6.43	5.60	4.77	3.95	3.12	2.29	12
10.0	8.45	7.37	6.29	5.21	4.12	3.04	9
7.5	11.85	10.35	8.84	7.33	5.83	4.32	7
5.0	18.7	16.4	14.0	11.63	9.27	6.90	4
2.5	-	-	-	24.6	19.7	14.7	2

T_A
Ambient temp. [°C]

Junction to ambient thermal resistance, $R_{th\ j-a}$	< 20.0	K/W
Junction to case thermal resistance, $R_{th\ j-c}$	< 1.10	K/W
Case to heatsink thermal resistance, $R_{th\ c-s}$	< 0.20	K/W
Maximum allowable case temperature	100	deg.C
Maximum allowable junction temperature	125	deg.C

Heatsink Dimensions (cont.)

RS40..

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	
40.0	1.25	1.04	0.82	0.61	0.39	0.18	47
36.0	1.59	1.35	1.10	0.85	0.60	0.36	41
32.0	2.02	1.74	1.45	1.16	0.87	0.58	35
28.0	2.53	2.19	1.85	1.51	1.17	0.83	29
24.0	3.12	2.70	2.29	1.87	1.46	1.04	24
20.0	3.95	3.43	2.91	2.39	1.87	1.35	19
16.0	5.21	4.53	3.85	3.18	2.50	1.83	15
12.0	7.33	6.39	5.45	4.51	3.57	2.62	11
8.0	11.63	10.16	8.68	7.20	5.72	4.24	7
4.0	24.6	21.5	18.4	15.3	12.2	9.12	3

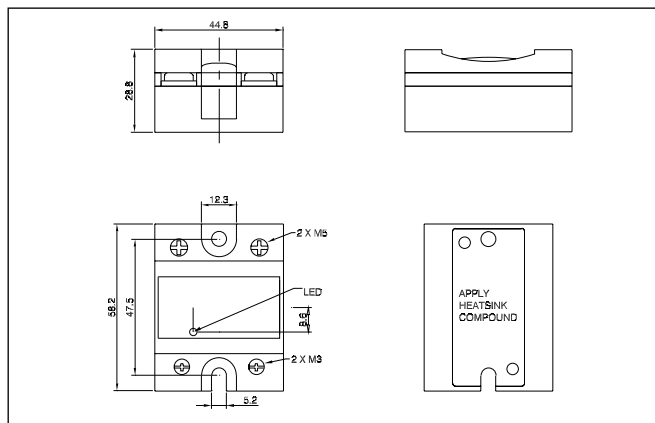
T_A
Ambient temp. [°C]

Junction to ambient thermal resistance, $R_{th\ j-a}$	< 20.0	K/W
Junction to case thermal resistance, $R_{th\ j-c}$	< 0.80	K/W
Case to heatsink thermal resistance, $R_{th\ c-s}$	< 0.20	K/W
Maximum allowable case temperature	100	deg.C
Maximum allowable junction temperature	125	deg.C

Heatsink Selection

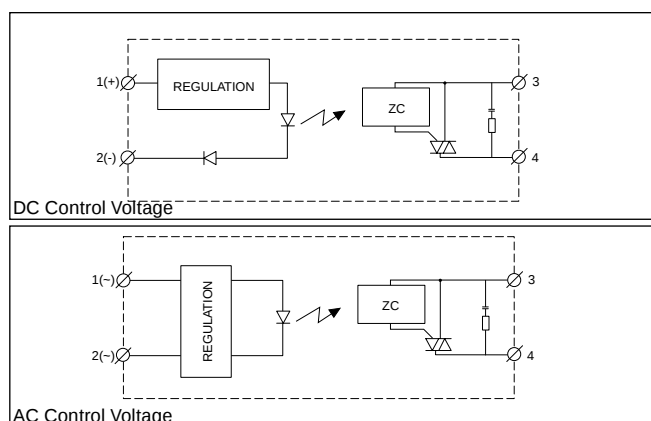
Carlo Gavazzi Heatsink (see Accessories)	Thermal resistance...	...for power dissipation
No heatsink required	---	N/A
RHS 300	5.00 K/W	> 0 W
RHS 100	3.00 K/W	> 25 W
RHS 45C	2.70 K/W	> 60 W
RHS 45B	2.00 K/W	> 60 W
RHS 90A	1.35 K/W	> 60 W
RHS 45A plus fan	1.25 K/W	> 0 W
RHS 45B plus fan	1.20 K/W	> 0 W
RHS 112A	1.10 K/W	> 100 W
RHS 301	0.80 K/W	> 70 W
RHS 90A plus fan	0.45 K/W	> 0 W
RHS 112A plus fan	0.40 K/W	> 0 W
RHS 301 plus fan	0.25 K/W	> 0 W
Consult your distribution	> 0.25 K/W	N/A
Infinite heatsink - No solution	---	N/A

Dimensions



All dimensions in mm

Functional Diagram



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 ** F4 *

RS, RM Solid State Relay

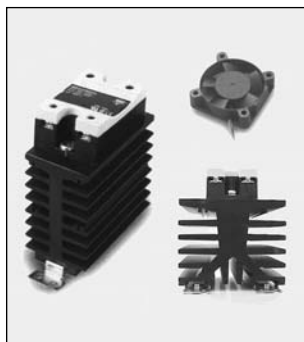
Tab orientation

* 0: Flat (0°)

4: Angled (45°)

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

Other Accessories



- Heatsinks and fans
- Type RHS....
- 0.25 to 5.00 k/W
- Single and dual relay types



- 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, fuses, varistors and spacers.
For further information refer to Accessories datasheets.