

# 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 40AACrms and 480 VAC
- Non-repetitive voltage: Up to 1200 Vp
- Opto-insulation: > 4000 VACrms
- Integrated snubber network in 25A and 40A types

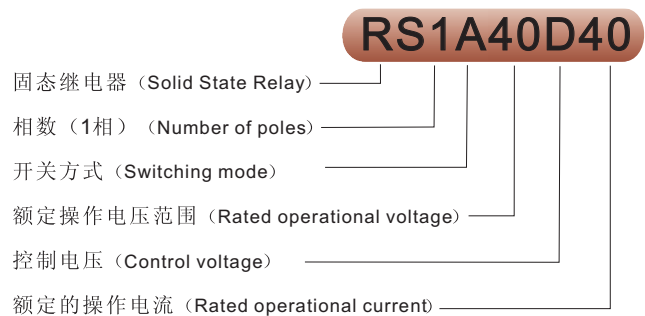


### 产品描述 (Product Description)

这种零点切换的固态继电器采用三端双向可控硅元件使用于阻抗性负载切换是个成本较低方案。当交流波曲线经过零点时，过零切换继电器才处于“ON”状态，反之当交流波曲线经过零点时，过零切换继电器才处于“OFF”状态。LED灯指示输入控制的状态，防护盖能让保护等级达到IP20，功率输出端子可以连接16mm的电缆。

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 mm<sup>2</sup>.

### 定货索引 (Ordering Key)



### 型号选择 (Type Selection)

开关方式 (Switching mode)	额定操作电压 (Rated operational voltage)	额定操作电流 (Rated operational current)	控制电压 (Control voltage)
零点开关 (A: Zero Switching)	23: 230VACrms 40: 400VACrms 48: 480VACrms	10: 10AACrms 25: 25AACrms 40: 40AACrms	LA: 18 to 36VAC/VDC D: 3 to 32 VDC <small>*4 to 32VDC for 400VAC and 480VAC types</small>

### 选型指南 (Selection Guide)

额定操作电压 (Rated operational voltage)	峰值电压 (Non-rep. voltage)	控制电压 (Control voltage)	额定操作电流 (Rated operational current)		
			10 A	25 A	40 A
230 VACrms	650 Vp	3-32 VDC 18-36 VAC/DC	RS1A23D10 RS1A23LA10	RS1A23D25 RS1A23LA25	RS1A23D40 RS1A23LA40
400 VACrms	850 Vp	4-32 VDC 18-36 VAC/DC	RS1A40D10 RS1A40LA10	RS1A40D25 RS1A40LA25	RS1A40D40 RS1A40LA40
480 VACrms	1200 Vp	4-32 VDC 18-36 VAC/DC	RS1A48D10 RS1A48LA10	RS1A48D25 RS1A48LA25	RS1A48D40 RS1A48LA40

### 一般规格 (General Specifications)

	RS1A23...	RS1A40...	RS1A48...
操作的电压范围 (Operational voltage range)	42 to 265 VACrms	42 to 440 VACrms	42 to 530 VACrms
非重复峰值电压 (Non-rep. peak voltage)	≥ 650 Vp	≥ 850 Vp	≥ 1200 Vp
零点打开电压 (Zero voltage turn-on)	≤ 15 V	≤ 15 V	≤ 15 V
操作的频率范围 (Operational frequency range)	45 to 65 Hz	45 to 65 Hz	45 to 65 Hz
功率因素 (Power factor)	≥ 0.95 @ 230 VACrms	≥ 0.95 @ 400 VACrms	≥ 0.95 @ 480 VACrms

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### 输入规格 (Input Specifications)

	RS1A..D..	RS1A..LA...
控制电压 (Control voltage) RS1.23.. RS1.40.., RS1.48..	3-32 VDC 4-32 VDC	18-36 VAC/DC
起始电压 (Pick-up voltage) RS1.23.. RS1.40.., RS1.48..	≤ 2.75 VDC ≤ 3.75 VDC	≤ 18 VAC/DC
反向电压 (Reverse voltage)	≤ 32 VDC	-
脱离电压 (Drop out voltage)	≥ 1.2 VDC	≥ 5 VAC/DC
输入电流@ 最大输入电压 (Input current @ max input voltage)	≤ 12 mA	≤ 15 mA
反应时间 (Response time pick-up)	≤ 1/2 cycle	≤ 1 cycle
脱离反应时间 (Response time drop-out)	≤ 1/2 cycle	≤ 2 cycles

### 输出规格 (Output Specifications)

	RS1A...10	RS1A...25	RS1A...40
额定的操作电流 (Rated operational current) AC51 @ Ta=25° C	10 Arms	25 Arms	40 Arms
最少的操作的电流 (Min. operational current)	150 mA	150 mA	150 mA
过电流 t=1s(Rep. overload current t=1 s)	< 12 AACrms	< 37 AACrms	< 60 AACrms
非重复冲击电流 (Non-rep. surge current t=10 ms)	100 Ap	300 Ap	390 Ap
断态泄露电流 @ 对电压和频率估计 (Off-state leakage current @ rated voltage and frequency)	< 3 mArms	< 3 mArms	< 3 mArms
I2t for fusing t=1-10 ms	≤ 50 A2s	≤ 450 A2s	≤ 760 A2s
临界的di/dt (Critical di/dt)	≥ 10 A/μs	≥ 50 A/μs	≥ 50 A/μs
通态电压降 (On-state voltage drop @ rated current)	≤ 1.6 Vrms	≤ 1.6 Vrms	≤ 1.6 Vrms
通态电压上升率 (Critical dV/dt off-state)	≥ 500V/μs	≥ 500 V/μs	≥ 500 V/μs

### 温度规格 (Thermal Specifications)

	RS1A...10	RS1A...25	RS1A...40
操作温度 (Operating temperature)	-20° to 70° C	-20° to 70° C	-20° to 70° C
储藏温度 (Storage temperature)	-40° to 100° C	-40° to 100° C	-40° to 100° C

### 整体规格 (Housing Specifications)

重量 (Weight) t	大约 (Approx) .60 g
外壳材料 Housing material	尼龙 (Noryl GFN 1, black)
底板 (Baseplate)	铝 (Aluminium)
Potting compound	None
继电器 (Relay)	
安装螺钉 (Mounting screws)	M5
架置扭矩 (Mounting torque)	1.5-2.0 Nm
控制端子 (Control terminal)	
安装螺钉 (Mounting screws)	M3 x 9
架置扭矩 (Mounting torque)	0.5 Nm
功率端子 (Power terminal)	
安装螺钉 (Mounting screws)	M5 x 9
架置扭矩 (Mounting torque)	2.4 Nm

### 绝缘 (Insulation)

额定的绝缘电压 (Rated insulation voltage) 输入对输出 (Input to output)	≥ 4000 VACrms
额定的绝缘电压 (Rated insulation voltage) 输出对外壳 (Output to case)	≥ 4000 VACrms



散热器尺寸(负荷电流对应周围温度) **Heatsink Dimensions** (load current versus ambient temperature)

RS10.

负荷电流 Load current [A]	热量抵抗 Thermal resistance[K/W]						耗散功率 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

周围环境温度 Ambient temp. [°C] TA

RS25.

负荷电流 Load current [A]	热量抵抗 Thermal resistance[K/W]						耗散功率 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

周围环境温度 Ambient temp. [°C] TA

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

Junction to ambient thermal resistance, Rthj-a	< 20.0	K/W
Junction to case thermal resistance, Rthj-c	< 1.10	K/W
Case to heatsink thermal resistance, Rth c-s	< 0.20	K/W
Maximum allowable case temperature	100	deg.C
Maximum allowable junction temperature	125	deg.C

散热器尺寸 (Heatsink Dimensions) (cont.)

RS40..

负荷电流 Load current [A]	热量抵抗 Thermal resistance[K/W]						耗散功率 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

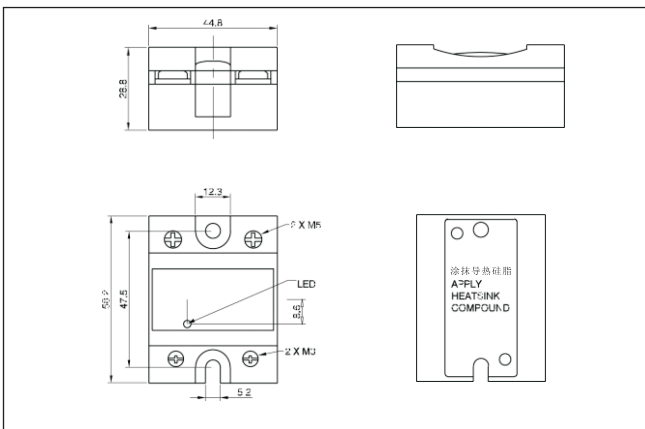
周围环境温度 Ambient temp. [°C] TA

Junction to ambient thermal resistance, Rthj-a	< 20.0	K/W
Junction to case thermal resistance, Rthj-c	< 0.80	K/W
Case to heatsink thermal resistance, Rth c-s	< 0.20	K/W
Maximum allowable case temperature	100	deg.C
Maximum allowable junction temperature	125	deg.C

散热器选择 (Heatsink Selection)

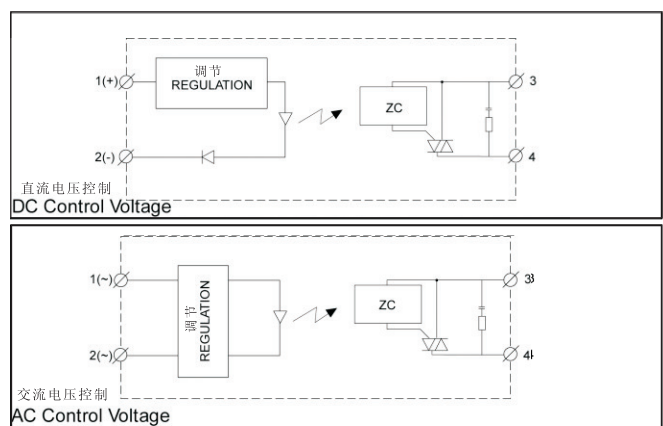
Heatsink (see Accessories)	Thermal resistance	...for power ... dissipation
No heatsink required --- N/A		
RHS 300	5.00 K/W	> 0 W
RHS 100	3.00 K/W	> 25 W
RHS 45C	2.70 K/W	> 60 W
RHS 45B	2.00 K/W	> 60 W
RHS 90A	1.35 K/W	> 60 W
RHS 45A plus fan	1.25 K/W	> 0 W
RHS 45B plus fan	1.20 K/W	> 0 W
RHS 112A	1.10 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

外型尺寸 (Dimensions)



所有尺寸是毫米 (All dimensions in mm)

功能图 (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

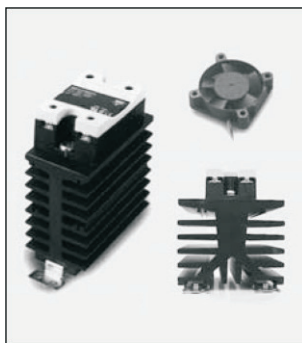
**RM48\*\* | F4\***

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

其它辅助部件 (Other Accessories)



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



所有固态继电器辅助部件与装配必须被预定。  
其它辅助部件包括DIN 路轨适配器、保险丝、压敏变阻器和卡座。

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.