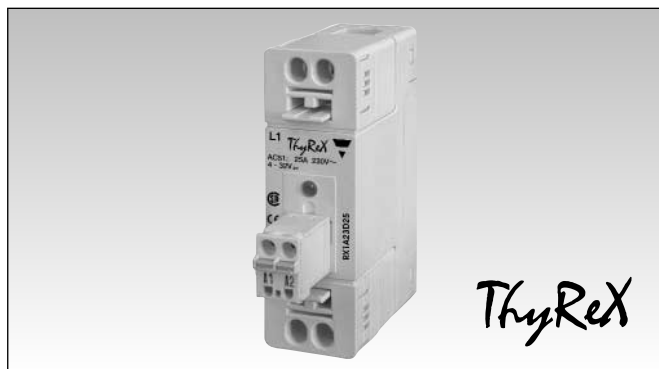


# Solid State Relays Industrial, 1-Phase ZS, Fully Pluggable Type RX1A

CARLO GAVAZZI



- Zero switching (RX1A) AC Solid State Relay
- Direct copper bonding (DCB) technology
- LED indication
- IP 20 protection cover
- Screw, Spring or FASTON terminal options
- Housing free of moulding mass
- 2 input ranges: 4-32 VDC and 24-275 VAC
- Operational ratings up to 50 AACrms and 480 VACrms
- Blocking voltage: Up to 1200 V<sub>p</sub>
- Opto-insulation: > 4000 VACrms
- Integrated snubber network

## Product Description

The RX ThyReX is an extremely compact industrial SSR that is fully pluggable to make installation and servicing easy. This zero switching relay can be used for resistive and inductive loads. The position of the M4 mounting holes makes this solution interchangeable with standard hockey-puck relays. The control plug can have either screw or spring termi-

nals. The power connection can be a screw type plug, a spring type plug or an open two-spade FASTON solution that comes with safety covers (no plugs). Both screw and spring type power plugs have a specially designed security lever to lock/unlock. To facilitate assembly, the RX ThyReX can be ordered with its own thermal pad (optional).

## Ordering Key

**RX 1 A 48 D 50 M P HT**

Solid State Relay	_____
Number of poles	_____
Switching mode	_____
Rated operational voltage	_____
Control voltage	_____
Rated operational current	_____
Control plug type	_____
Power plug type	_____
Options	_____

## Type Selection

Switching mode	Rated operational voltage	Control voltage	Rated operational current	Control plug type	Power plug type	Options
A: Zero Switching	23: 230 VACrms 48: 480 VACrms	A: 24-275 VAC D: 4 - 32 VDC	25 : 25 AACrms 50 : 50 AACrms 51 : 50 AACrms*	M: Spring V: Screw	F: Faston C: Screw P: Spring	Blank: Basic HT: Thermal Pad H20: RHS23A** H21: RHS23B**

\* High surge

\*\* Add suffix 'H2x' to RX part no. for mounting of RX unit to heatsink type RHS23A or RHS23B. For such assemblies, attached derating curve should be consulted for appropriate selection of operational load current. Note that RX1A...25...H21 version is not available.

## General Specifications

	RX1A23..	RX1A48..
Operational voltage range	24 to 265 VACrms	42 to 552 VACrms
Blocking voltage	≥ 650 V <sub>p</sub>	≥ 1200 V <sub>p</sub>
Zero voltage turn-on	≤ 10 V	≤ 10 V
Operational frequency range	45 to 65 Hz	45 to 65 Hz
Power factor	> 0.5 @ 230 VACrms	> 0.5 @ 480 VACrms
Pollution degree		
RX1A...D...	3	3
RX1A...A...	2	2
Approvals	UL, cUL, CSA*	UL, cUL, CSA*
CE-marking	Yes	Yes

\* RX1A...51 CSA certification in progress

## Thermal Specifications

Operating temperature	-30° to +70°C (-22° to +158°F)
Storage temperature	-40° to +80°C (-40° to +176°F)
Junction temperature	≤ 125°C (257°F)

## Isolation

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

### Control Plug with Spring Terminals - Power Plug with Spring Terminals

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			25 A	50 A	50 A (high surge)
230 VACrms	650Vp	4-32 VDC 24-275 VAC	RX1A23D25MP RX1A23A25MP	RX1A23D50MP RX1A23A50MP	RX1A23D51MP RX1A23A51MP
480 VACrms	1200Vp	4-32 VDC 24-275 VAC	RX1A48D25MP RX1A48A25MP	RX1A48D50MP RX1A48A50MP	RX1A48D51MP RX1A48A51MP

### Control Plug with Spring Terminals - Power Plug with Screw Terminals

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			25 A	50 A	50 A (high surge)
230 VACrms	650Vp	4-32 VDC 24-275 VAC	RX1A23D25MC RX1A23A25MC	RX1A23D50MC RX1A23A50MC	RX1A23D51MC RX1A23A51MC
480 VACrms	1200Vp	4-32 VDC 24-275 VAC	RX1A48D25MC RX1A48A25MC	RX1A48D50MC RX1A48A50MC	RX1A48D51MC RX1A48A51MC

### Control Plug with Screw Terminals - Power Plug with Screw Terminals

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			25 A	50 A	50 A (high surge)
230 VACrms	650Vp	4-32 VDC 24-275 VAC	RX1A23D25VC RX1A23A25VC	RX1A23D50VC RX1A23A50VC	RX1A23D51VC RX1A23A51VC
480 VACrms	1200Vp	4-32 VDC 24-275 VAC	RX1A48D25VC RX1A48A25VC	RX1A48D50VC RX1A48A50VC	RX1A48D51VC RX1A48A51VC

### Control Plug with Screw Terminals - Power Plug with Spring Terminals

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			25 A	50 A	50 A (high surge)
230 VACrms	650Vp	4-32 VDC 24-275 VAC	RX1A23D25VP RX1A23A25VP	RX1A23D50VP RX1A23A50VP	RX1A23D51VP RX1A23A51VP
480 VACrms	1200Vp	4-32 VDC 24-275 VAC	RX1A48D25VP RX1A48A25VP	RX1A48D50VP RX1A48A50VP	RX1A48D51VP RX1A48A51VP

### Control Plug with Spring Terminals - Power: FASTON Terminals

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			25 A	50 A	50 A (high surge)
230 VACrms	650Vp	4-32 VDC 24-275 VAC	RX1A23D25MF RX1A23A25MF	RX1A23D50MF RX1A23A50MF	RX1A23D51MF RX1A23A51MF
480 VACrms	1200Vp	4-32 VDC 24-275 VAC	RX1A48D25MF RX1A48A25MF	RX1A48D50MF RX1A48A50MF	RX1A48D51MF RX1A48A51MF

### Control Plug with Screw Terminals - Power: FASTON Terminals

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			25 A	50 A	50 A (high surge)
230 VACrms	650Vp	4-32 VDC 24-275 VAC	RX1A23D25VF RX1A23A25VF	RX1A23D50VF RX1A23A50VF	RX1A23D51VF RX1A23A51VF
480 VACrms	1200Vp	4-32 VDC 24-275 VAC	RX1A48D25VF RX1A48A25VF	RX1A48D50VF RX1A48A50VF	RX1A48D51VF RX1A48A51VF

## Output Specifications

	RX1A...25...	RX1A...50...	RX1A...51... (high surge)
Rated operational current AC51 @ Ta=25°C	25 Arms	50 Arms	50 Arms
AC53a @ Ta=25°C	5 Arms	15 Arms	20 Arms
Min. operational current	150 mA	250 mA	400 mA
Non-rep. surge current t=10 ms	325 A <sub>p</sub>	600 A <sub>p</sub>	1150 A <sub>p</sub>
Off-state leakage current @ rated voltage and frequency	< 3 mArms	< 3 mArms	< 3 mArms
I <sup>2</sup> t for fusing t= 10 ms	< 525 A <sup>2</sup> s	< 1800 A <sup>2</sup> s	< 6600 A <sup>2</sup> s
On-state voltage drop	≤ 1.6 Vrms	≤ 1.6 Vrms	≤ 1.6 Vrms
Critical dV/dt off-state min.	500 V/μs	500 V/μs	500 V/μs

## Housing Specifications

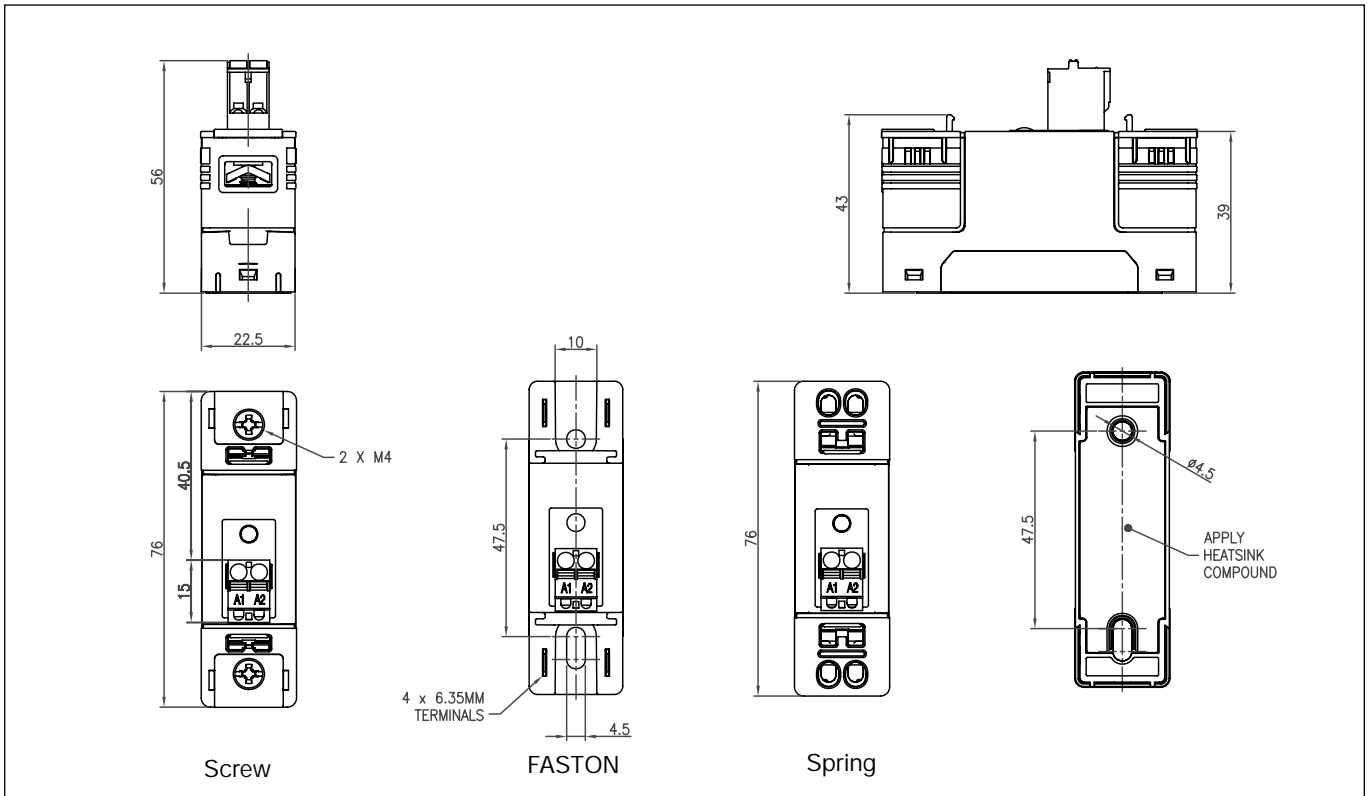
Weight without plugs	Approx. 64 g	<b>Power terminal (screw)</b>	
with plugs	Approx. 86 g	Terminal screws	M4
Housing material	PA, grey	Maximum tightening torque	2 Nm with Posidriv 2 bit
Baseplate	Aluminium	Min. cross-sectional area of cable with bootlace ferrule	1 x 1.5mm <sup>2</sup> (1 x AWG16)
<b>Control terminal (screw)</b>		Max. cross-sectional area of cable with bootlace ferrule	1 x 6.0mm <sup>2</sup> (1 x AWG10) or 2 x 6.0mm <sup>2</sup> (2 x AWG10)
Terminal tightening screws	M3	Ring terminal, max. outer diameter	10mm
Max. terminal tightening torque	0.8 Nm with Philips bit	<b>Power terminal (spring)</b>	
Min. cross-sectional area of cable (stranded)	1 x 0.05mm <sup>2</sup> (1 x AWG30)	Insulation stripping length	13mm
Max. cross-sectional area of cable (stranded)	1 x 2.5mm <sup>2</sup> (1 x AWG12) or 2 x 1.5mm <sup>2</sup> (2 x AWG16)	Min. cross-sectional area of cable (stranded)	1 x 0.5mm <sup>2</sup> (1 x AWG20)
<b>Control terminal (spring)</b>		Max. cross-sectional area of cable (stranded)	2 x 6.0mm <sup>2</sup> (2 x AWG10)
Insulation stripping length	10mm	<b>Power terminal (FASTON)</b>	
Min. cross-sectional area of cable (stranded)	1 x 0.2mm <sup>2</sup> (1 x AWG24)	FASTON terminal size	6.3 x 0.8mm
Max. cross-sectional area of cable (stranded)	1 x 2.5mm <sup>2</sup> (1 x AWG12)	Max. allowable relative humidity (no moisture condensation)	95%
		<b>Mounting</b>	
		Mounting screws	M4
		Mounting torque	1.5 Nm

## Input Specifications

	RX1A...D...	RX1A...A...
Control voltage range	4-32 VDC	24 - 275 VAC
Pick-up voltage	3.5 VDC	18 VAC
Reverse voltage	32 VDC	-
Drop out voltage	1.2 VDC	6 VAC
Input current @ max input voltage	≤ 12 mA	-
RMS input current	-	≤ 36 mA
Average rectified input current	-	≤ 12 mA
Response time pick-up	≤ 10 ms	≤ 20 ms
Response time drop-out	≤ 10 ms	≤ 70 ms

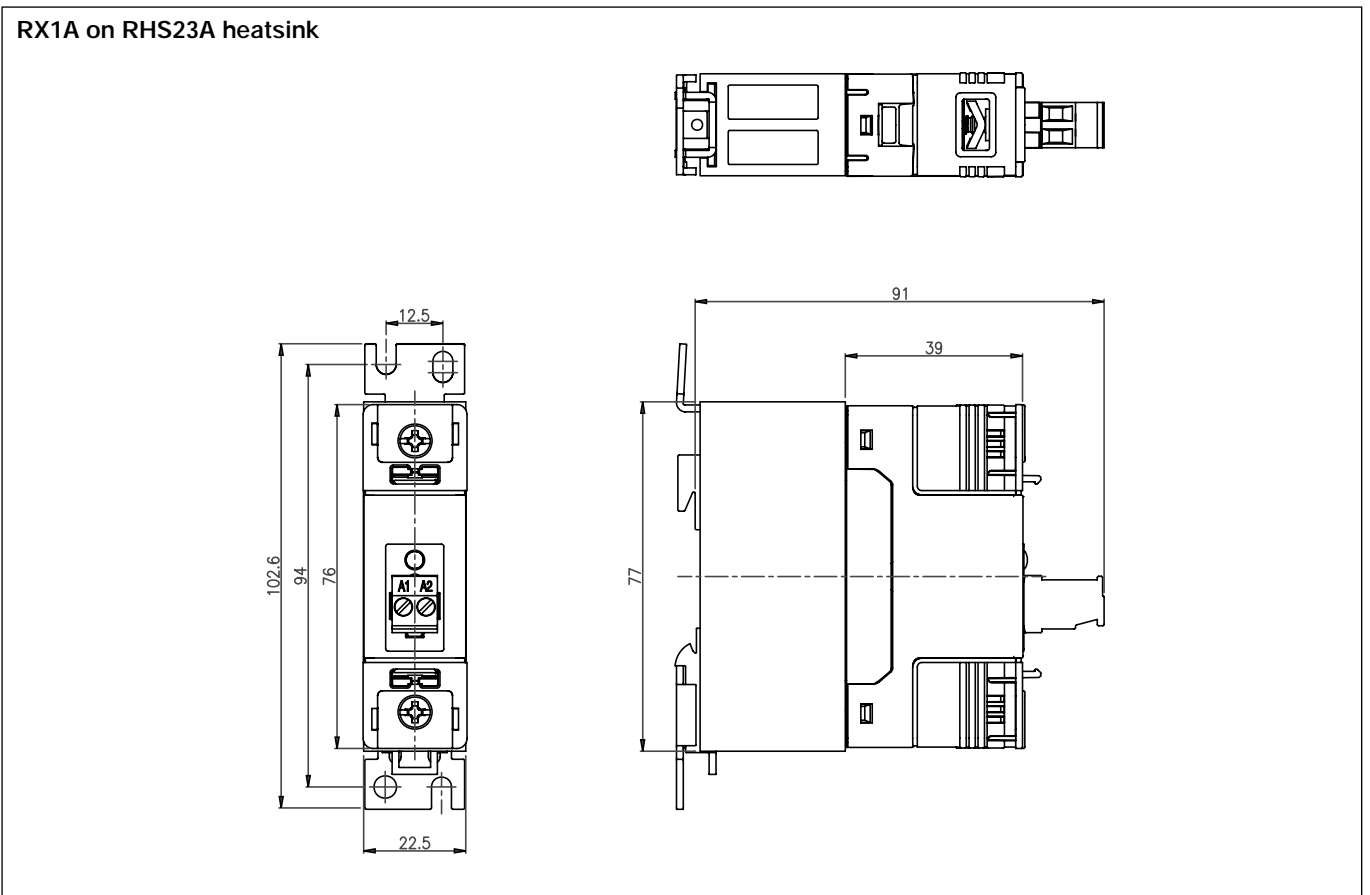
Data specified @ Ta=25°C

## Dimensions



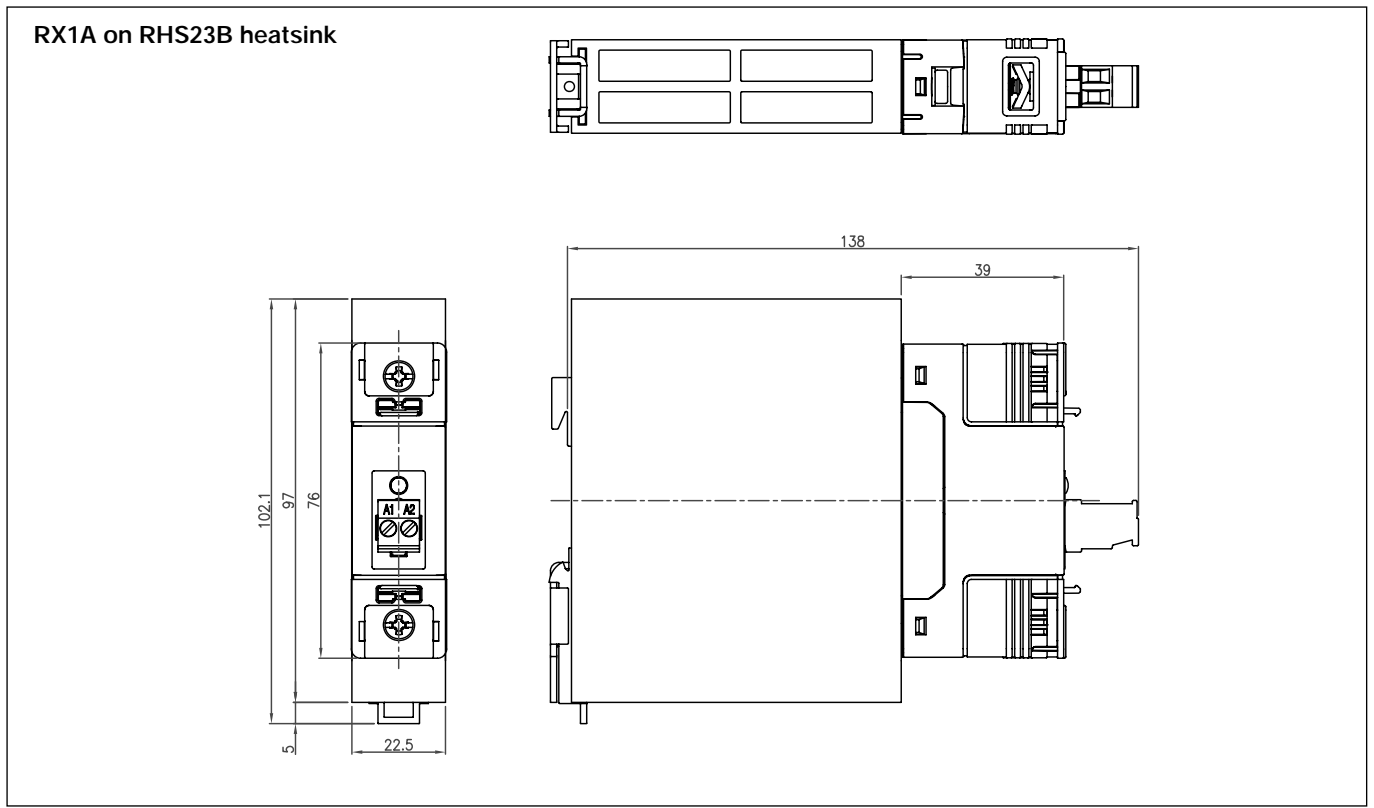
All dimensions in mm

### RX1A on RHS23A heatsink



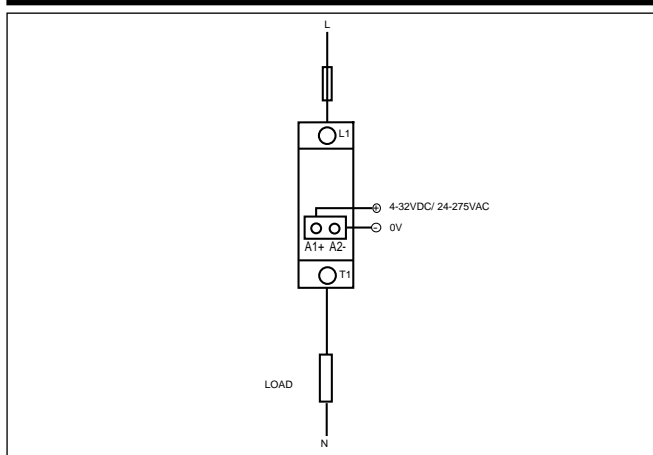
All dimensions in mm

## Dimensions (cont.)

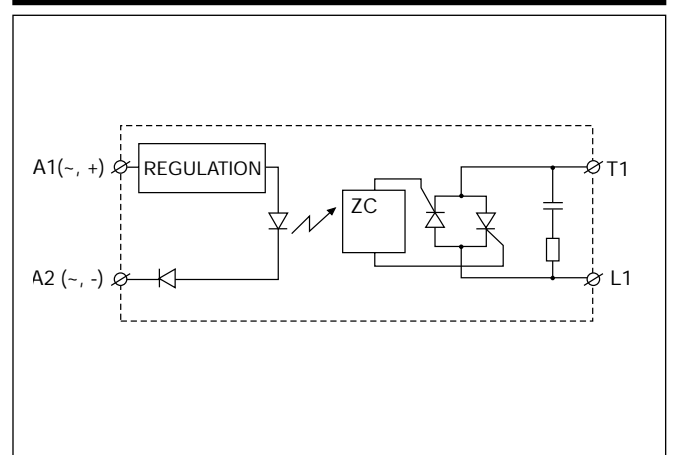


All dimensions in mm

## Wiring Diagram



## Functional Diagram



## Accessories

- RX1A....25, RX1A....50, RX1A....51
- RCV25
- RCM25
- RPC60
- RPP60
- RPFCAP

- Main module without input or output plugs
- Packet of 20 input plugs with screw terminals
- Packet of 20 input plugs with spring terminals
- Packet of 10 output plugs with screw terminals
- Packet of 10 output plugs with spring terminals
- Packet of 10 FASTON touch protection covers

## Heatsink Dimensions (load current versus ambient temperature)

### RX1A...25

Load Current (A)	Thermal Resistance [K/W]						Power Dissipation (W)
	20	30	40	50	60	70	
25.0	1.61	1.30	0.98	0.51	0.05	-	32
22.5	2.10	1.74	1.38	0.87	0.33	-	28
20.0	2.73	2.31	1.89	1.33	0.68	0.06	24
17.5	3.55	3.05	2.56	1.95	1.16	0.41	20
15.0	4.66	4.06	3.46	2.83	1.83	0.89	17
12.5	6.24	5.49	4.74	3.98	2.83	1.59	13
10.0	8.65	7.67	6.68	5.70	4.46	2.72	10
7.5	12.7	11.3	9.97	8.60	7.23	4.79	7
5.0	-	18.8	16.6	14.5	12.3	9.8	5
2.5	-	-	-	-	-	-	2

Surrounding Ambient temperature (°C)

### RX1A...50

Load Current (A)	Thermal Resistance [K/W]						Power Dissipation (W)
	20	30	40	50	60	70	
50	0.99	0.74	0.49	0.25	-	-	66
45	1.25	0.96	0.68	0.39	0.11	-	58
40	1.59	1.25	0.91	1.58	0.25	-	50
35	2.04	1.63	1.22	0.82	0.43	0.04	42
30	3.08	2.65	2.15	1.65	1.16	0.68	35
25	4.01	3.56	2.9	2.26	1.64	1.03	28
20	5.42	4.84	4.09	3.22	2.39	1.58	21
15	7.8	6.99	6.18	4.93	3.7	2.52	15
10	12.6	11.3	10.1	8.8	6.57	4.55	10
5	-	-	-	19.2	16.5	11.8	5

Surrounding Ambient temperature (°C)

### RX1A...51

Load Current (A)	Thermal Resistance [K/W]						Power Dissipation (W)
	20	30	40	50	60	70	
50	1.6	1.38	1.15	0.93	0.71	0.48	48
45	1.88	1.62	1.37	1.11	0.86	0.6	43
40	2.22	1.93	1.63	1.34	1.05	0.75	37
35	2.67	2.33	1.98	1.64	1.29	0.95	32
30	3.27	2.86	2.45	2.03	1.62	1.21	27
25	4.13	3.62	3.11	2.6	2.09	1.59	22
20	5.43	4.76	4.11	3.45	2.8	2.15	17
15	7.63	6.71	5.8	4.89	3.99	3.1	12
10	12.2	10.7	9.26	7.83	6.42	5.03	8
5	26.8	23.5	20.2	11.1	14	11	4

Surrounding Ambient temperature (°C)

Notes:

1. Device must be mounted on a heatsink or plate with both mounting screws fastened for correct operation.
2. Thermal resistance values indicated above are valid for assemblies using thermal paste Electrolube HTS or thermal pad Graftech HT010A, i.e.,  $R_{th_{cs}}=0.16K/W$ . For thermal paste/pads with a higher  $R_{th}$ , manufacturer should be consulted for selection of appropriate heatsinking.

## Derating Curves (RX assembled to heatsink types RHS23x)

