

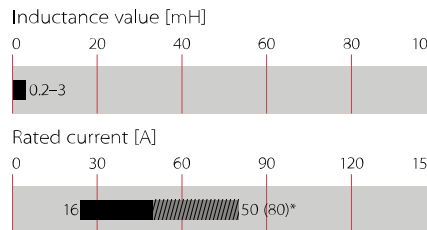
# Current-compensated Chokes



- Rated currents from 16 to 50 A
- Up to 600 VAC or 1000 VDC
- 2- and 3-wire configurations
- Horizontal and vertical PCB mounting types
- Ruggedized saturation and thermal behavior
- Open construction for forced and convection cooling
- Straightforward pin-out for easy PCB design



### Performance indicators



## Technical specifications

|  |  |
|--|--|
| <b>Maximum continuous operating voltage</b>      | 600 VAC/1000 VDC                                 |
| <b>Operating frequency</b>                       | DC to 400 Hz                                     |
| <b>Rated currents</b>                            | 16 to 50 A @ 60°C max. convection cooling        |
| <b>High potential test voltage</b>               |  |
| <b>winding-to-winding</b>                        | 2500 VAC, 60 sec, guaranteed, 2 sec factory test |
| <b>Temperature range (operation and storage)</b> | -40°C to +125°C (40/125/21) acc. IEC 60068-1     |
| <b>Flammability corresponding to</b>             | UL 94 V-0  |
| <b>Cooling</b>                                   | convection/forced cooling                        |
| <b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>           | >5,000,000 hours                                 |

## Approvals & Compliances

### ROHS

RB common-mode chokes are mainly used to filter EMI noise on AC power lines up to 600 VAC but they are as well applicable in DC power lines of photovoltaic installations or similar applications up to 1000 VDC. EMI noise of electronic equipment can go to the power lines and disturb the proper function of other devices like TV sets or radios. Thus noise generated by the equipment from switched power electronics or by high slew rates of controllers needs to be filtered. RB common-mode chokes are used to suppress EMI noise in PCB integrated filter designs with line bypass capacitors or in combination with single phase filters for extra low leakage filter designs.

## Features and benefits

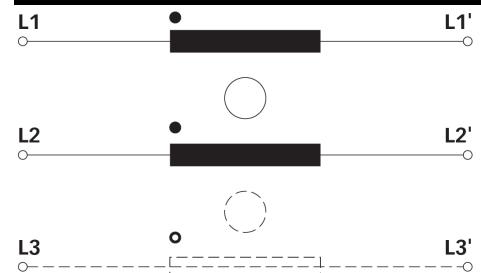
- Cost-effective PCB designs for up to 80 A with forced cooling \*
- Compact size and light weight
- Low magnetic leakage flux
- Excellent winding insulation
- Standardized foot print
- Broad range of inductance ratings
- Custom-specific versions on request
- Evaluation Board and PCB footprints available

\* See Application Note for forced cooling

## Typical applications

- AC and DC filtering for midsize power range drives, photovoltaic inverters, fast chargers, charging stations, UPS and switch mode power supplies
- Filter with low leakage current noise or improved immunity against grid disturbances
- Electronic devices, automation
- Converters

### Typical electrical schematic



### RB Series

| Selection table | Buy | convection                         | *forced cooling                  | Inductance          | Inductance          | Resistance         | **Choke | Ø Pin     | Length      | Weight | Eval.     |
|-----------------|-----|------------------------------------|----------------------------------|---------------------|---------------------|--------------------|---------|-----------|-------------|--------|-----------|
|                 |     | cooling nominal current @ 60°C [A] | 3 m/s nominal current @ 60°C [A] | Ln @ 25°C [mH/path] | Ls @ 25°C [µH/path] | R @ 25°C [mΩ/path] | [size]  | D [mm]    | Pin L [mm]  | [g]    | Board No. |
| RB6122-16-1M0   |     | 16                                 | 25                               | 1.00                | 6.3                 | 4.8                | 1       | 2.0 ±0.1  | 4.5 +0.5/-0 | 130    | 1         |
| RB6122-25-0M6   |     | 25                                 | 39                               | 0.64                | 4.0                 | 2.7                | 1       | 2.4 ±0.1  | 4.5 +0.5/-0 | 135    | 1         |
| RB6122-36-0M5   |     | 36                                 | 53                               | 0.45                | 3.6                 | 1.5                | 2       | 2.2 ±0.1  | 4.5 +0.5/-0 | 180    | 1         |
| RB6122-50-0M3   |     | 50                                 | 80                               | 0.25                | 1.8                 | 0.9                | 2       | 2.5 ±0.1  | 5.0 +0.5/-0 | 172    | 1         |
| RB6522-16-1M0   |     | 16                                 | 25                               | 1.00                | 6.2                 | 4.6                | 3       | 2.0 ±0.1  | 4.5 +0.5/-0 | 132    | 2         |
| RB6522-25-0M6   |     | 25                                 | 39                               | 0.64                | 3.9                 | 2.6                | 3       | 2.4 ±0.1  | 4.5 +0.5/-0 | 126    | 2         |
| RB6522-36-0M5   |     | 36                                 | 53                               | 0.45                | 3.6                 | 1.5                | 4       | 2.2 ±0.1  | 4.5 +0.5/-0 | 180    | 2         |
| RB6522-50-0M3   |     | 50                                 | 80                               | 0.25                | 2.0                 | 0.9                | 4       | 2.5 ±0.1  | 5.0 +0.5/-0 | 175    | 2         |
| RB8522-16-3M0   |     | 16                                 | 25                               | 3.00                | 22.2                | 8.4                | 4       | 2.0 ±0.1  | 4.5 +0.5/-0 | 172    | 3         |
| RB8522-25-2M0   |     | 25                                 | 39                               | 2.00                | 13.6                | 4.2                | 5       | 2.65 ±0.1 | 5.0 +0.5/-0 | 268    | 3         |
| RB8522-36-1M5   |     | 36                                 | 53                               | 1.50                | 12.8                | 3.0                | 6       | 2.2 ±0.1  | 4.5 +0.5/-0 | 440    | 3         |
| RB8522-50-0M8   |     | 50                                 | 83                               | 0.75                | 6.5                 | 1.7                | 6       | 2.5 ±0.1  | 5.0 +0.5/-0 | 430    | 3         |
| RB6132-16-0M8   |     | 16                                 | 26.5                             | 0.80                | 5.8                 | 4.6                | 7       | 2.0 ±0.1  | 4.5 +0.5/-0 | 162    | 4         |
| RB6132-25-0M5   |     | 25                                 | 41                               | 0.47                | 3.3                 | 2.4                | 7       | 2.5 ±0.1  | 5.0 +0.5/-0 | 175    | 4         |
| RB6132-36-0M4   |     | 36                                 | 60                               | 0.42                | 2.9                 | 1.4                | 8       | 2.2 ±0.1  | 4.5 +0.5/-0 | 278    | 5         |
| RB6132-50-0M2   |     | 50                                 | 80                               | 0.18                | 1.9                 | 0.9                | 8       | 2.5 ±0.1  | 5.0 +0.5/-0 | 765    | 5         |
| RB6532-16-0M8   |     | 16                                 | 26.5                             | 0.80                | 6.9                 | 4.7                | 9       | 2.0 ±0.1  | 4.5 +0.5/-0 | 165    | 6         |
| RB6532-25-0M5   |     | 25                                 | 41                               | 0.47                | 3.6                 | 2.4                | 9       | 2.5 ±0.1  | 5.0 +0.5/-0 | 180    | 6         |
| RB6532-36-0M4   |     | 36                                 | 60                               | 0.42                | 4.2                 | 1.5                | 10      | 2.2 ±0.1  | 4.5 +0.5/-0 | 280    | 6         |
| RB6532-50-0M2   |     | 50                                 | 81                               | 0.18                | 1.5                 | 0.8                | 10      | 2.5 ±0.1  | 5.0 +0.5/-0 | 168    | 6         |
| RB8532-16-1M3   |     | 16                                 | 27                               | 1.30                | 9.1                 | 5.7                | 9       | 2.0 ±0.1  | 4.5 +0.5/-0 | 167    | 7         |
| RB8532-25-0M9   |     | 25                                 | 41                               | 0.94                | 6.7                 | 3.0                | 11      | 2.65 ±0.1 | 5.0 +0.5/-0 | 282    | 7         |
| RB8532-36-0M8   |     | 36                                 | 58                               | 0.83                | 7.3                 | 2.3                | 12      | 2.2 ±0.1  | 4.5 +0.5/-0 | 478    | 7         |
| RB8532-50-0M3   |     | 50                                 | 82                               | 0.33                | 3.1                 | 1.2                | 12      | 2.5 ±0.1  | 5.0 +0.5/-0 | 442    | 7         |

Test conditions:  
 Measuring frequency: 1 kHz; 500 µA >0.16 mH <1.6 mH; 50 µA >1.6 mH <160 mH  
 Inductance tolerance: +50%, -30%  
 Resistance tolerance: ±15% @ 25°C  
 Electrical characteristics @ 25°C: ±2°C

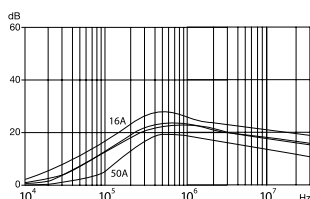
\* typical current for forced cooling with 3 m/s. Due to the possible turbulences and degradation of the air stream within an equipment please consider thermal validation.

\*\* Due to manufacturing processes and to cover current ampacity of chokes with high current rating, the number of parallel wires does vary between different sizes.

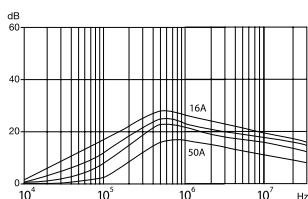
### Typical choke attenuation/resonance frequency characteristics

Per CISPR 17; 50 Ω/50 Ω asym

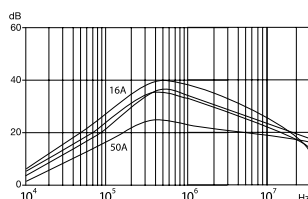
RB 6122, RB 6522



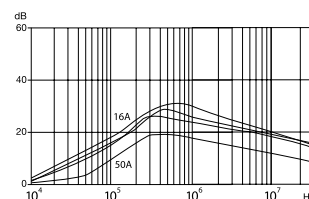
RB 6132, RB 6532



RB 8522



RB 8532



### Product selector

RB xxxx-xx-xmx

- Inductance value (e.g. 9M6 = 9.6 mH)
- Nominal input current [A] (convection cooling)
- Terminal type ( 2 for PCB pin)

- 2 = 2-wire choke
- 3 = 3-wire choke

- 1 = Horizontal
- 5 = Vertical

- 8 = high inductance series
- 6 = low inductance series

Schaffner standard ring-core choke series RB

### Thermal Derating

If higher ambient temperatures than the specified apply, the nominal current needs to be reduced according to the graph below.

| Temperature (°C) | x IN (A) |
|------------------|----------|
| -20              | 1.0      |
| 0                | 1.0      |
| 20               | 1.0      |
| 40               | 1.0      |
| 60               | 1.0      |
| 80               | 0.8      |
| 100              | 0.5      |
| 120              | 0.0      |

Examples:

RB 8532-16-1M3: Vertical 3-wire high inductance choke with PCB pins, for 16 A, with 1.3 mH

RB 6122-50-0M3: Horizontal 2-wire low inductance choke with PCB pins, for 50 A, with 0.3 mH

### Mechanical data: 1-phase / DC chokes

All dimensions in mm; 1 inch = 25.4 mm

Tolerances according: ISO 2768-m/EN 22768-m

Windings of chokes are within max. component dimensions. Windings are illustrated simplified.

#### Size 1 (RB 6122)

MAX COMPONENT VOLUME

2.41 ± 0.20 R25.67

28.07

20.32 ± 0.30

15.24 ± 0.30

5.08 ± 0.20

25.4 ± 0.30

43.31

45.72 ± 0.40

53.3

51.34

Max.51.64

12.83

2XØ3.4±8.5

For self tapping screw M4

MAX COMPONENT VOLUME

Max.53.6

Max.41.8

D

#### Size 2 (RB 6122)

MAX COMPONENT VOLUME

3.94 ± 0.20 R28.9

35.43

25.4 ± 0.30

20.32 ± 0.30

5.08 ± 0.20

30.48 ± 0.30

49.4

53.34 ± 0.40

61

57.8

Max.58.1

10.03

2XØ3.4±8.5

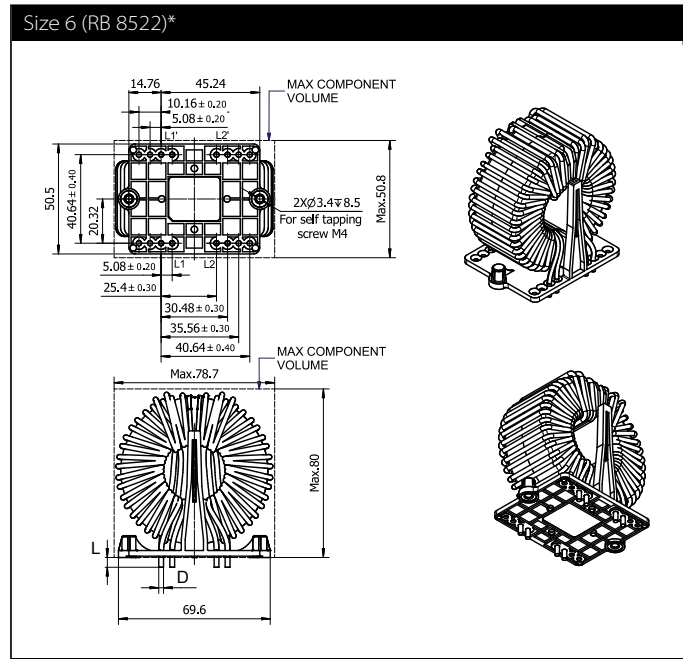
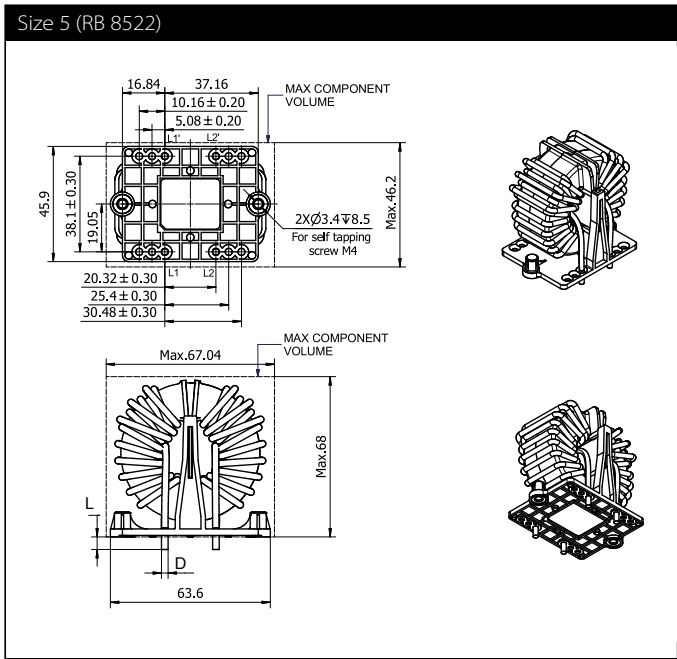
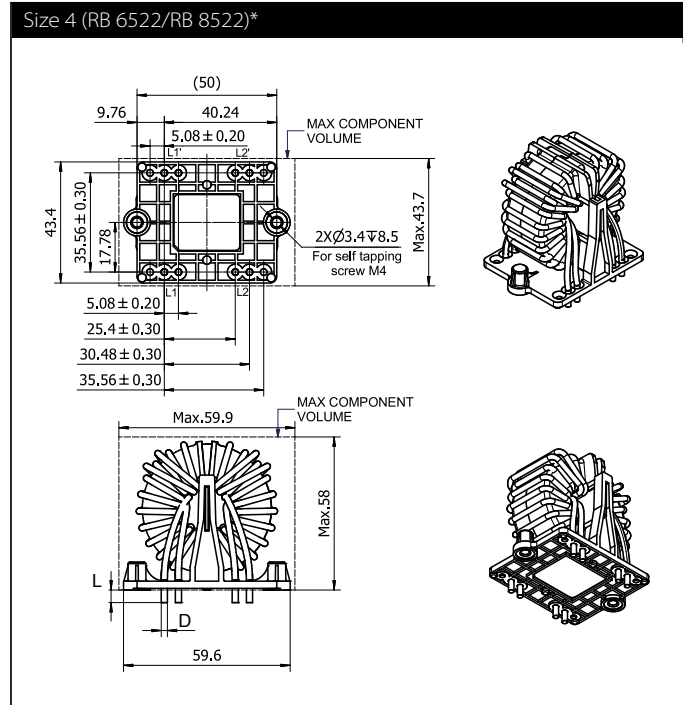
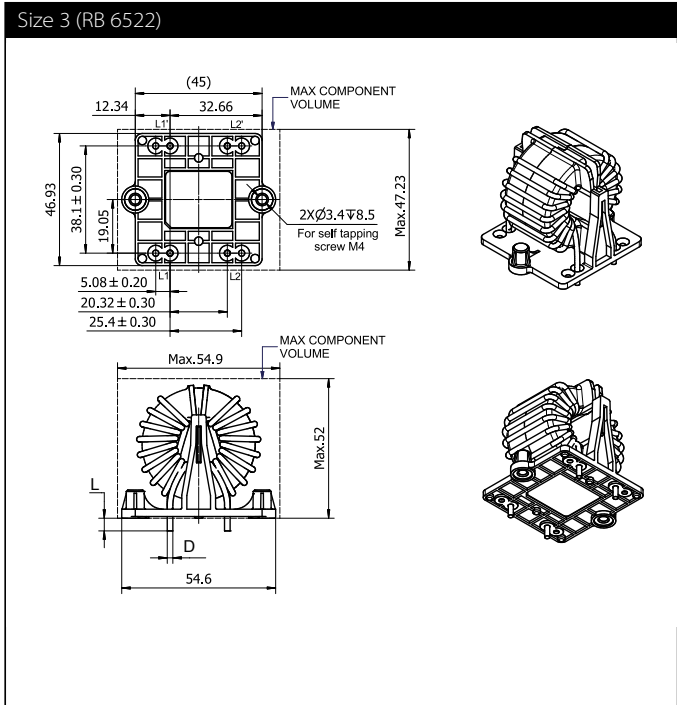
For self tapping screw M4

MAX COMPONENT VOLUME

Max.61.3

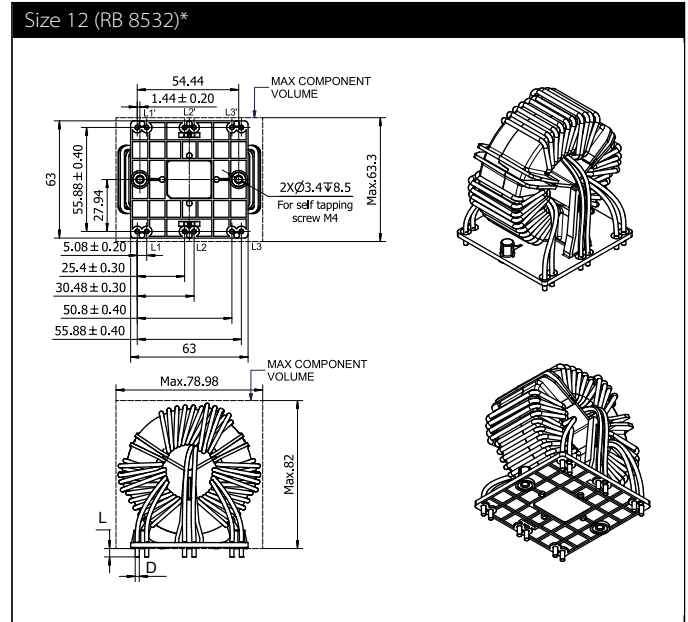
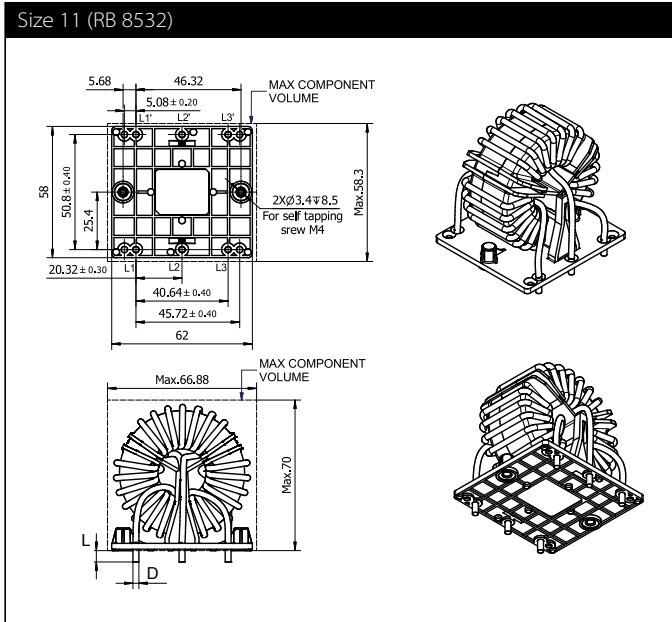
Max.38.3

D



\* These choke sizes do have two parallel wires. Due to manufacturing processes and to cover current ampacity of chokes with high current rating, the number of parallel wires does vary between different sizes.





\* These choke sizes do not have two parallel wires. Due to manufacturing processes and to cover current ampacity of chokes with high current rating, the number of parallel wires does vary between different sizes.

### Available Supporting Material

#### Accessories

For all RB choke types an evaluation board is available (not including capacitors and RB chokes)

All boards feature voltage ratings according to the chokes usable on the board - up to 600VAC/1000VDC.

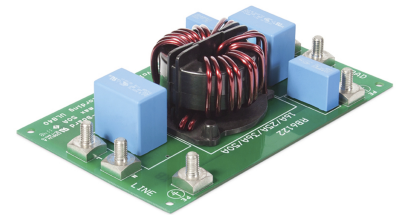
The capacitors used need to be selected according to application and safety level. Recommended are Y1 and X1 capacitors with a voltage rating of at least 600VAC and 1000VDC.

The pitch for Y-capacitors (between phase and PE) is 15 or 22.5 mm. With a max outer dimension of 12 x 26 mm (w x l).

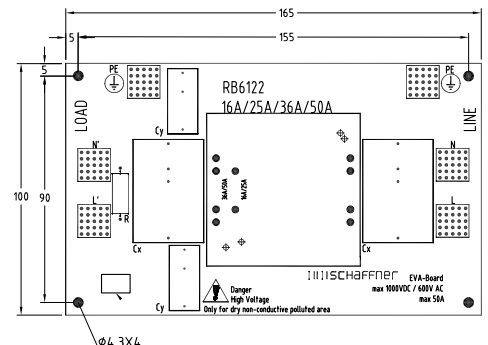
The pitch for X-capacitors (between phases) is 22.5, 27.5 or 37.5 mm. With a max outer dimension of 28 x 40 mm (w x l).

For discharge reason a resistor can be fitted in parallel to the X-capacitors.

All connections to the boards are done with M6 screw terminals (recommended torque is 2.5 Nm).



| Selection table | Nom. Current of RB Choke | Eval. Board | Order Name                  | Order Code |
|-----------------|--------------------------|-------------|-----------------------------|------------|
| [RB XXXX]       | [Range A]                | No          |                             |            |
| RB 6122         | 16 - 50                  | 1           | EVA-BOARD FOR RB6122 SERIES | 813249     |
| RB 6522         | 16 - 50                  | 2           | EVA-BOARD FOR RB6522 SERIES | 813252     |
| RB 8522         | 16 - 50                  | 3           | EVA-BOARD FOR RB8522 SERIES | 813254     |
| RB 6132         | 16 - 25                  | 4           | EVA-BOARD FOR RB6132-16/25  | 813250     |
| RB 6132         | 36 - 50                  | 5           | EVA-BOARD FOR RB6132-36/50  | 813251     |
| RB 6532         | 16 - 50                  | 6           | EVA-BOARD FOR RB6532 SERIES | 813253     |
| RB 8532         | 16 - 50                  | 7           | EVA-BOARD FOR RB8532 SERIES | 813255     |



For further drawings and CAD data of the different boards please contact your local Schaffner subsidiary.

#### Application Note

##### EMC/EMI Filter Design with RB Common Mode-Chokes

This application note addresses experienced engineers, who are familiar with the basics of EMC, and intends to provide additional information about RB choke series and Design support for PCB integrated EMC/EMI filters.

[Link to PDF](#)



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