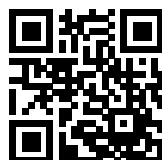


Current-compensated Chokes - Ferrite Core



- Efficient ferrite core material
- AC and DC applications
- Low magnetic leakage flux
- Excellent winding insulation
- Broad range of inductance ratings
- RV8140 - horizontal orientation
- RV8540 - vertical orientation



Performance indicators

| standard | high | very high |
|----------|--------|-----------|
| | RV8x40 | RV8x41 |

| Common-mode Inductance [mH] | | |
|-----------------------------|---------------|------------------------------------|
| 0.1 | 0.3 | |
| 1.8 | 16.3 | RV8140 & RV8540 RV8141 & RV8541 |
| 7.2 (2-line) | | RV8140 & RV8540 |
| 1.2 | 65.2 (2-line) | RV8141 & RV8541 |

| Rated current [A] | |
|-------------------|----|
| 0.2 | 50 |
| | |

Approvals & Compliances



Features and Benefits

EV wallbox chargers up to 35kW

- On the grid side, the 4-line choke can be installed as 3 phases and neutral
- On the vehicle side of the charger (DC charging), 2 windings of the choke are connected in series or parallel
- Complies with choke-related requirements in IEC/EN 61851-1: Electric vehicle conductive charging system, IEC/EN 61851-21-2 (AC charging) & IEC/EN 61851-23: (DC charging)
- Complies with choke-related requirements in UL 2202: Electric Vehicle (EV) Charging System Equipment

Horizontal Version - Four Performance Choices

- S01 Standard
- S03 Standard Plus- increased height
- S11 Small
- S13 Small - increased height

Vertical Version - Four Performance Choices

- S02 Standard
- S06 Standard, thin - reduced core height
- S12 Small
- S16 Small, thin- reduced core height

Also available with nanocrystalline cores: RV8141 (horizontal) & RV8541 (vertical)

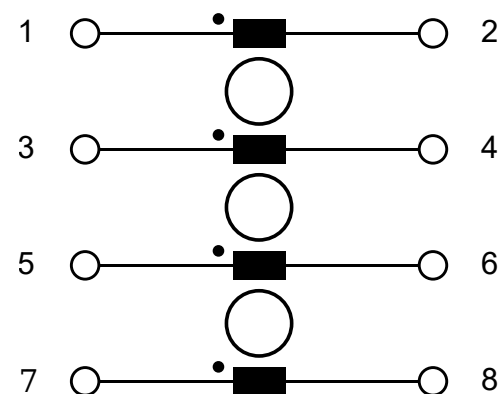
Technical Specifications

| | |
|--|--|
| Operating voltage | 530 VAC RMS 1000 VDC |
| Operating frequency | 50/60 Hz DC |
| Rated currents | 16 to 50 A @ 60°C |
| Cooling | AN |
| Rated inductance | 0.1 to 1.8 mH (4-line or parallel connection) 0.1 to 7.2 mH (2-line, series connection) |
| Stray inductance | Max. 1% of rated inductance @ 10 kHz |
| High potential test voltage | 3 kV AC 2s coil to coil |
| Overvoltage category | 530 VAC: III (acc. IEC 60664-1) 1000 VDC: II (acc. IEC 60664-1) |
| Creepage and clearance distances | Creepage: ≥ 7.2 mm (Coil - Coil) Clearance: ≥ 5.6 mm (Coil - Coil) |
| Design corresponding to | IEC 60938-1/-2 UL 1446 E332676 - Insulation system SCH-155(F)-C |
| Temperature range (operation and storage) | -40°C to +125°C |
| Climatic category | 40/125/56 (acc. IEC 60068-1) |
| Protection category | IP 00 (acc. IEC 60529-1) |
| Pollution degree | PD2 (acc. IEC60664-1) |
| Vibration and shock | Vibration (IEC 60068-2-6): 10 Hz to 55 Hz (24 cycles) Shock (IEC 60068-2-27): 30 G / 18 ms (3 cycles) |
| Flammability according to | UL 94 V0 |
| MTBF | >2,000,000 h |
| Altitude | 2000 m, current and voltage derating above |

Typical Applications

- EV charging: (AC & DC charging stations)
- General applications

Typical electrical schematic



Choke Selection Table

| Designation | Orientation | Rated Current @ 60°C [A] | Frame Size | Inductance* | | Resistance* [mOhm] | Weight [kg] |
|---------------|-------------|--------------------------------|------------|---------------|----------------|-----------------------|----------------|
| | | | | 10kHz [mH] | 100kHz [mH] | | |
| RV8140-16-S01 | Horizontal | 16 | 1 | 1.25 | 0.88 | 6.5 | 0.25 |
| RV8140-16-S03 | Horizontal | 16 | 3 | 1.76 | 1.24 | 8.1 | 0.36 |
| RV8140-16-S11 | Horizontal | 16 | 11 | 0.93 | 0.65 | 6.5 | 0.18 |
| RV8140-16-S13 | Horizontal | 16 | 13 | 1.35 | 0.95 | 8 | 0.26 |
| RV8140-25-S01 | Horizontal | 25 | 1 | 0.71 | 0.49 | 3 | 0.27 |
| RV8140-25-S03 | Horizontal | 25 | 3 | 0.99 | 0.69 | 3.7 | 0.38 |
| RV8140-25-S11 | Horizontal | 25 | 11 | 0.48 | 0.33 | 2.7 | 0.19 |
| RV8140-25-S13 | Horizontal | 25 | 13 | 0.69 | 0.48 | 3.3 | 0.27 |
| RV8140-32-S01 | Horizontal | 32 | 1 | 0.49 | 0.34 | 2.1 | 0.27 |
| RV8140-32-S03 | Horizontal | 32 | 3 | 0.69 | 0.48 | 2.7 | 0.38 |
| RV8140-32-S11 | Horizontal | 32 | 11 | 0.30 | 0.21 | 1.8 | 0.19 |
| RV8140-32-S13 | Horizontal | 32 | 13 | 0.44 | 0.31 | 2.2 | 0.28 |
| RV8140-40-S01 | Horizontal | 40 | 1 | 0.31 | 0.22 | 1.3 | 0.28 |
| RV8140-40-S03 | Horizontal | 40 | 3 | 0.44 | 0.31 | 1.5 | 0.39 |
| RV8140-40-S11 | Horizontal | 40 | 11 | 0.17 | 0.12 | 1.1 | 0.19 |
| RV8140-40-S13 | Horizontal | 40 | 13 | 0.25 | 0.17 | 1.3 | 0.27 |
| RV8140-50-S01 | Horizontal | 50 | 1 | 0.18 | 0.12 | 0.9 | 0.26 |
| RV8140-50-S03 | Horizontal | 50 | 3 | 0.25 | 0.17 | 1.1 | 0.37 |
| RV8140-50-S11 | Horizontal | 50 | 11 | 0.08 | 0.05 | 0.7 | 0.18 |
| RV8140-50-S13 | Horizontal | 50 | 13 | 0.11 | 0.08 | 0.9 | 0.26 |
| RV8540-16-S02 | Vertical | 16 | 2 | 1.25 | 0.88 | 6.9 | 0.27 |
| RV8540-16-S06 | Vertical | 16 | 6 | 0.63 | 0.44 | 5.3 | 0.16 |
| RV8540-16-S12 | Vertical | 16 | 12 | 0.93 | 0.65 | 6.9 | 0.20 |
| RV8540-16-S16 | Vertical | 16 | 16 | 0.47 | 0.33 | 5.6 | 0.12 |
| RV8540-25-S02 | Vertical | 25 | 2 | 0.71 | 0.49 | 3.2 | 0.29 |
| RV8540-25-S06 | Vertical | 25 | 6 | 0.35 | 0.25 | 2.6 | 0.18 |
| RV8540-25-S12 | Vertical | 25 | 12 | 0.48 | 0.33 | 3 | 0.21 |
| RV8540-25-S16 | Vertical | 25 | 16 | 0.24 | 0.17 | 2.4 | 0.13 |
| RV8540-32-S02 | Vertical | 32 | 2 | 0.49 | 0.34 | 2.3 | 0.29 |
| RV8540-32-S06 | Vertical | 32 | 6 | 0.25 | 0.17 | 1.8 | 0.18 |
| RV8540-32-S12 | Vertical | 32 | 12 | 0.30 | 0.21 | 2.1 | 0.21 |
| RV8540-32-S16 | Vertical | 32 | 16 | 0.15 | 0.11 | 1.7 | 0.13 |
| RV8540-40-S02 | Vertical | 40 | 2 | 0.31 | 0.22 | 1.4 | 0.30 |
| RV8540-40-S06 | Vertical | 40 | 6 | 0.16 | 0.11 | 1.2 | 0.19 |
| RV8540-40-S12 | Vertical | 40 | 12 | 0.17 | 0.12 | 1.3 | 0.21 |
| RV8540-40-S16 | Vertical | 40 | 16 | 0.09 | 0.06 | 1.1 | 0.13 |
| RV8540-50-S02 | Vertical | 50 | 2 | 0.18 | 0.12 | 1 | 0.28 |
| RV8540-50-S06 | Vertical | 50 | 6 | 0.09 | 0.06 | 0.9 | 0.18 |
| RV8540-50-S12 | Vertical | 50 | 12 | 0.08 | 0.05 | 0.9 | 0.20 |
| RV8540-50-S16 | Vertical | 50 | 16 | 0.04 | 0.03 | 0.8 | 0.13 |

* 2-line applications:

Series connection: Connect 2-3 and 6-7. => Inductance values multiply by 4, resistance doubles.

Parallel connection: Connect 1-3, 2-4, 5-7 and 6-8. => Inductance values remain the same, resistance halves.

See mechanical drawing for pin-out guidance.

Inductance test conditions: 10 kHz / 50 mV; 100 kHz / 1 V; tolerances +50%, -30%

Product selector

RV8t4x-yy-Szz

zz: Frame Size

| | |
|------------------------------|---------------------------|
| 01: Frame size standard | ∅ 66 x 41 mm, horizontal |
| 02: Frame size standard | 64 x 42 x 66 mm, vertical |
| 03: Frame size standard plus | ∅ 66 x 53 mm, horizontal |
| 06: Frame size standard thin | 64 x 30 x 66 mm, vertical |
| 11: Frame size small | ∅ 62 x 37 mm, horizontal |
| 12: Frame size small | 60 x 38x 60 mm, vertical |
| 13: Frame size small plus | ∅ 62 x 47 mm, horizontal |
| 16: Frame size small thin | 60 x 27 x 60 mm, vertical |

yy: Current
16 A to 50 A

x: Core material
0: Ferrite core
1: Nanocrystalline core

t: Orientation
1: Horizontal
5: Vertical

Distribution Inventory

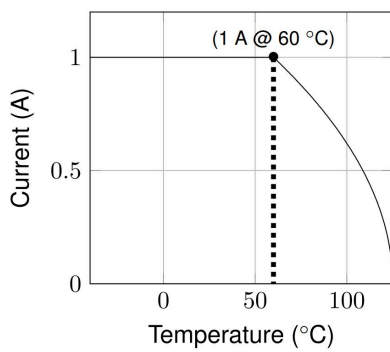
Up-to-date inventory levels for global distributors is available at

<https://products.schaffner.com/stock>



Thermal Derating

If higher ambient temperatures than the specified 60°C apply, the nominal current needs to be reduced according to the graph below.



$$I = I_N \cdot \sqrt{\frac{\Theta_{max} - \Theta_{act}}{\Theta_{max} - \Theta_N}}$$

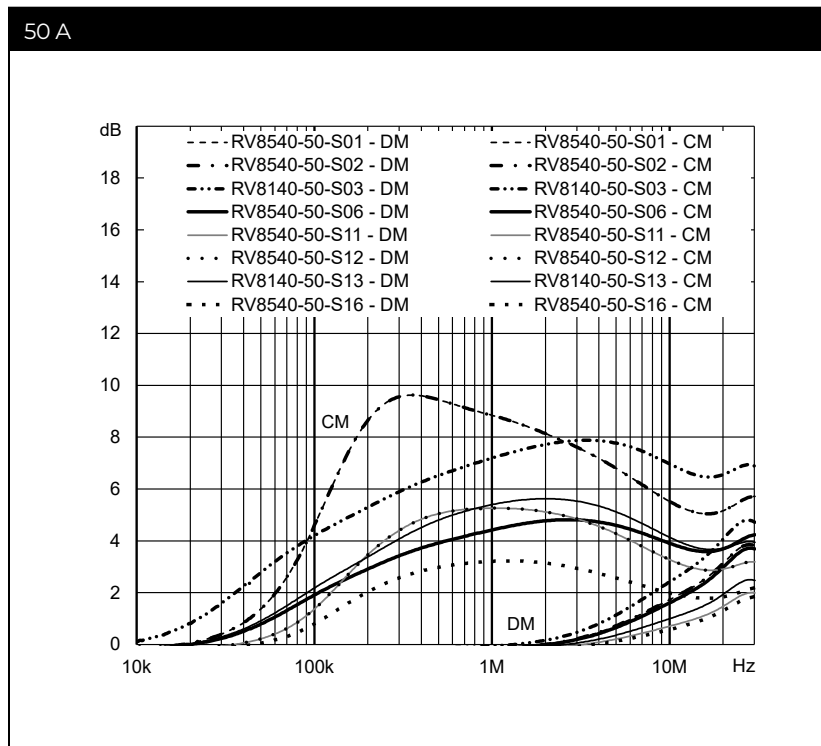
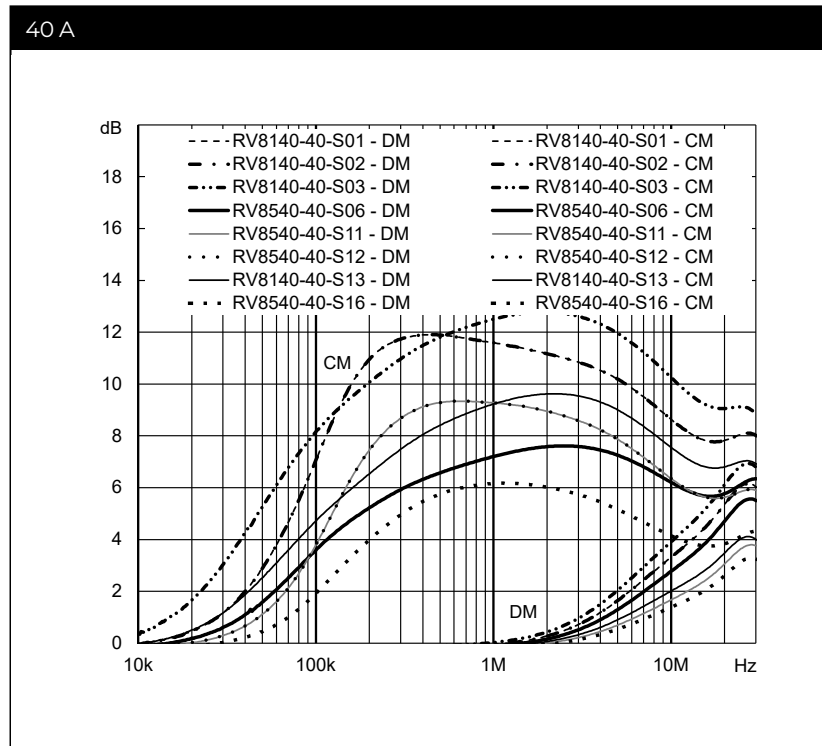
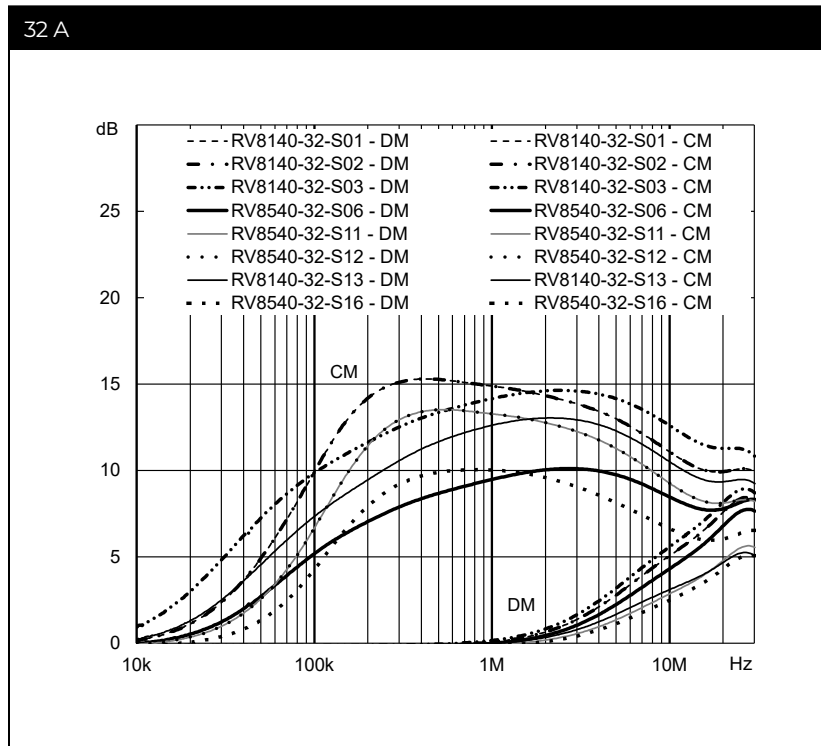
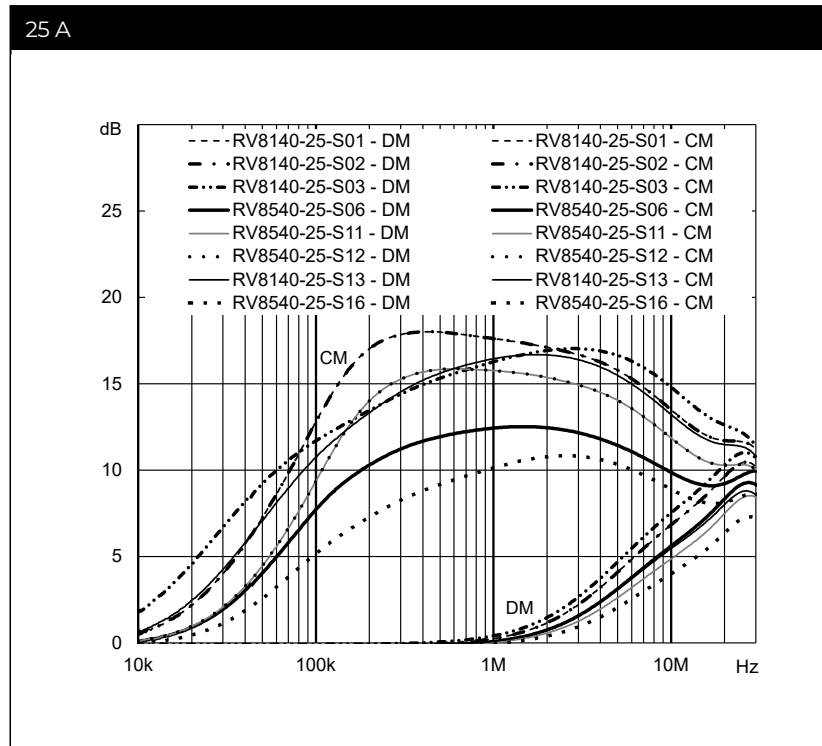
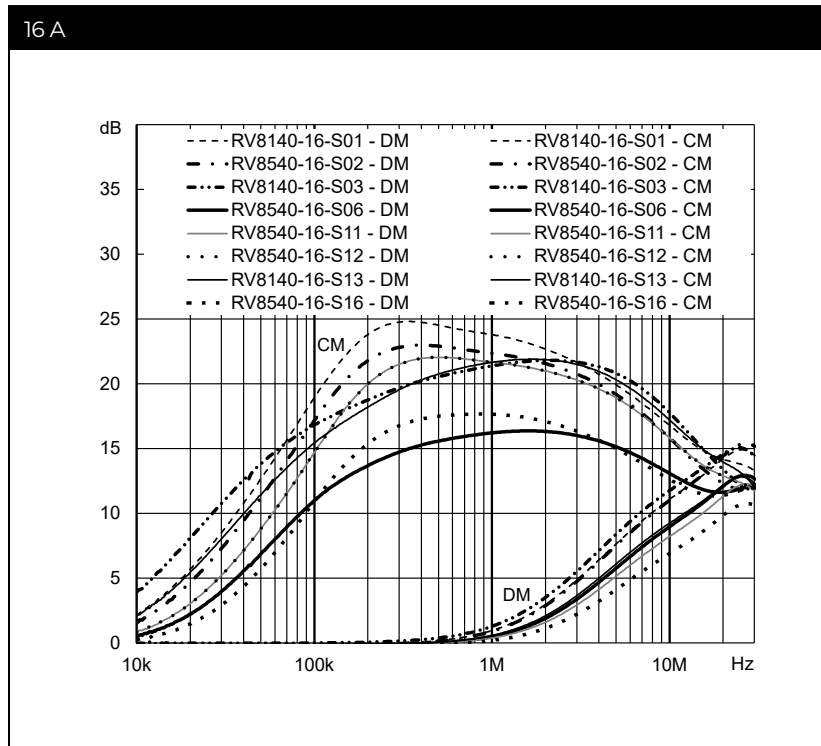
for $\Theta_{act} > \Theta_N$ and $\Theta_{act} < \Theta_{max}$

- I_N rated current at Θ_N
- Θ_{act} actual ambient temperature
- Θ_N temperature at which the rated current is defined
- Θ_{max} rated maximum temperature of the component

Normalized current value

Typical Choke Attenuation / Resonance Frequency Characteristics

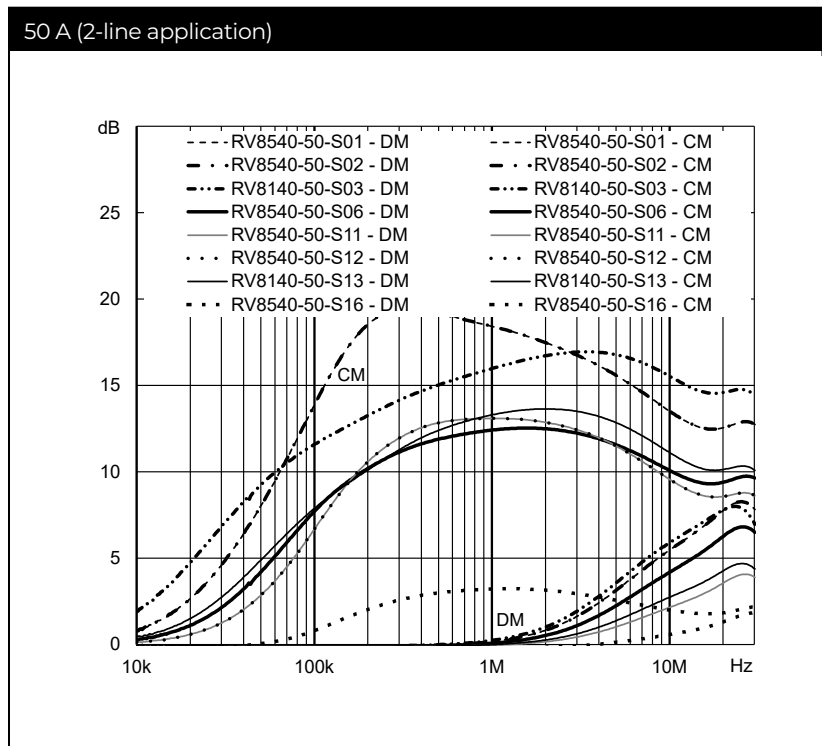
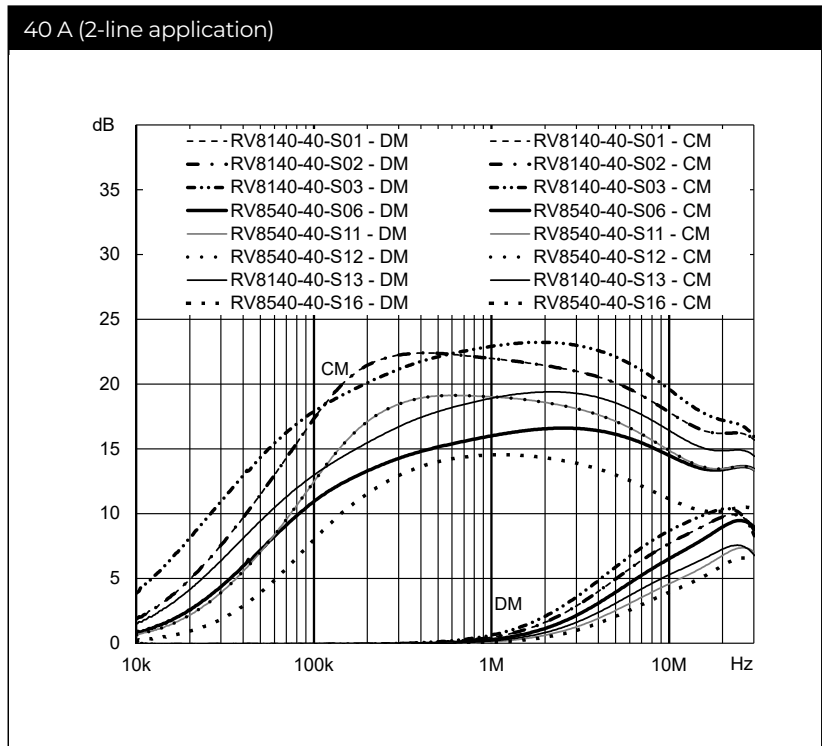
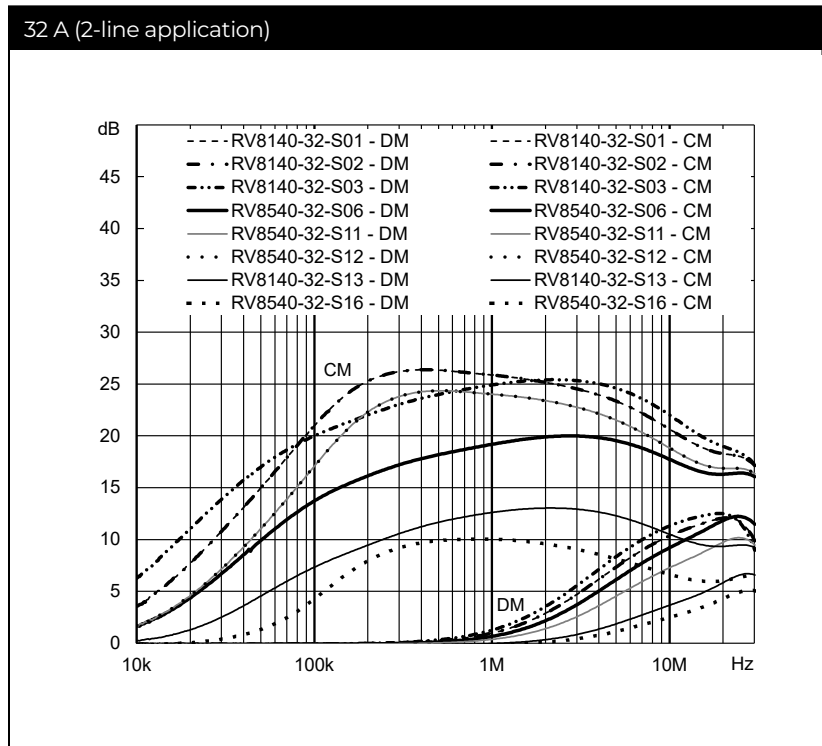
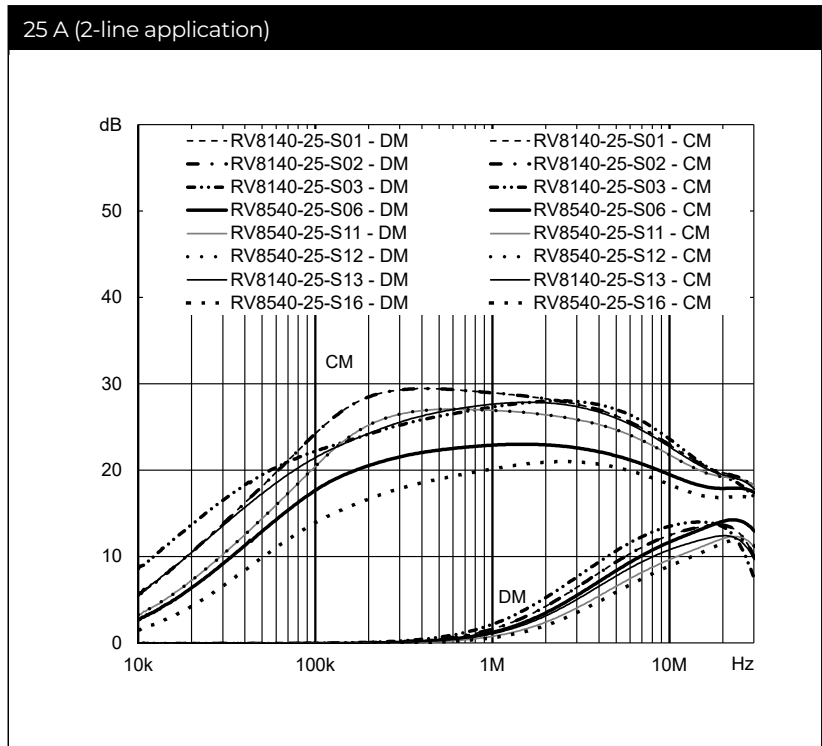
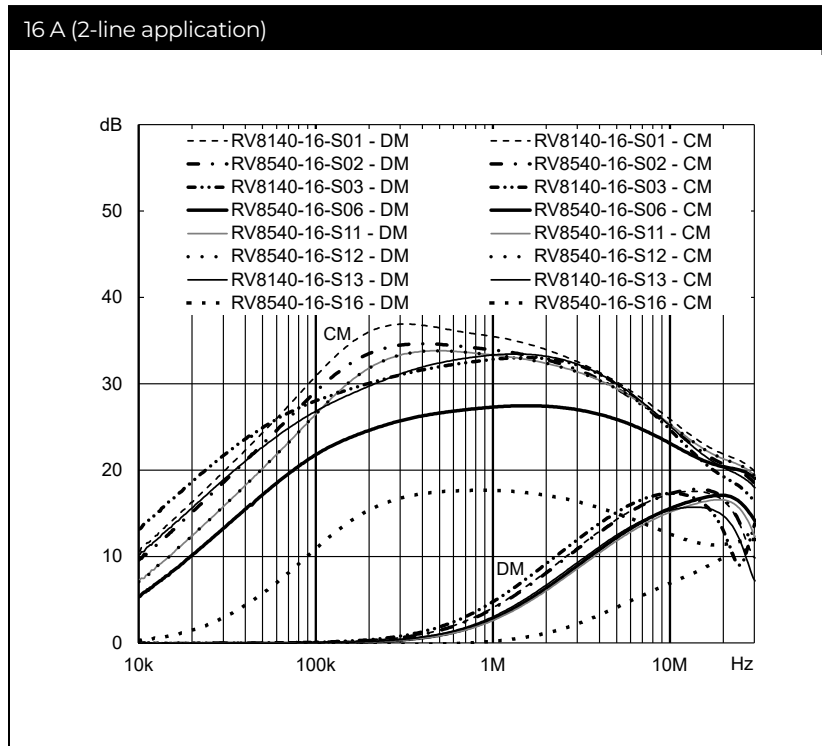
Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)
 4-line or parallel connection



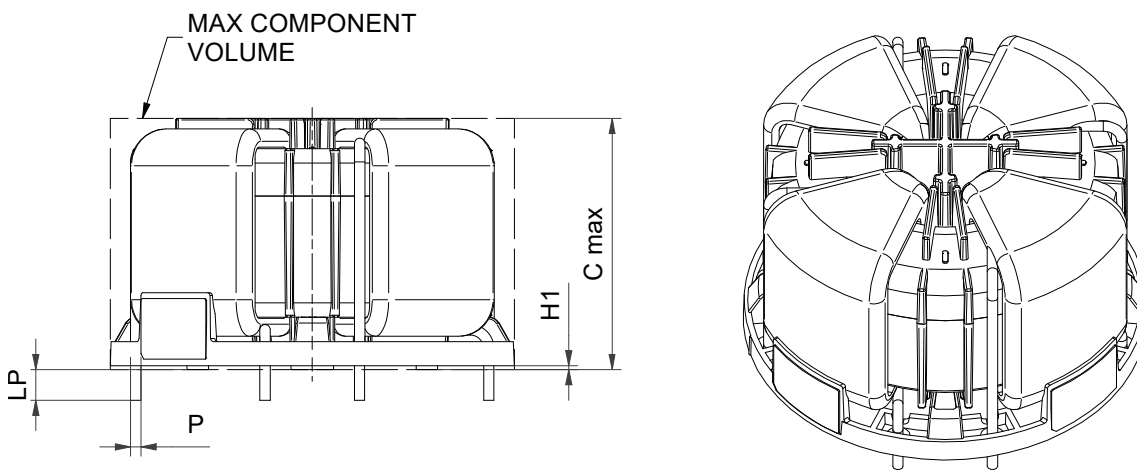
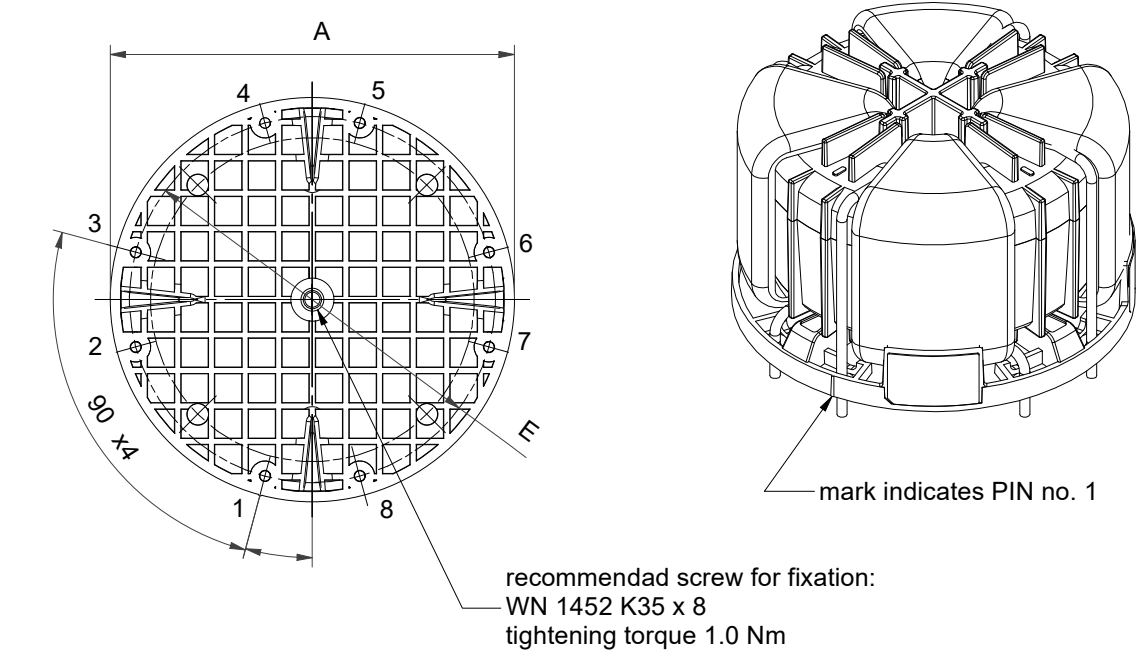
Typical Choke Attenuation / Resonance Frequency Characteristics - 2-Line Application

Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)

For 2-line / series connection

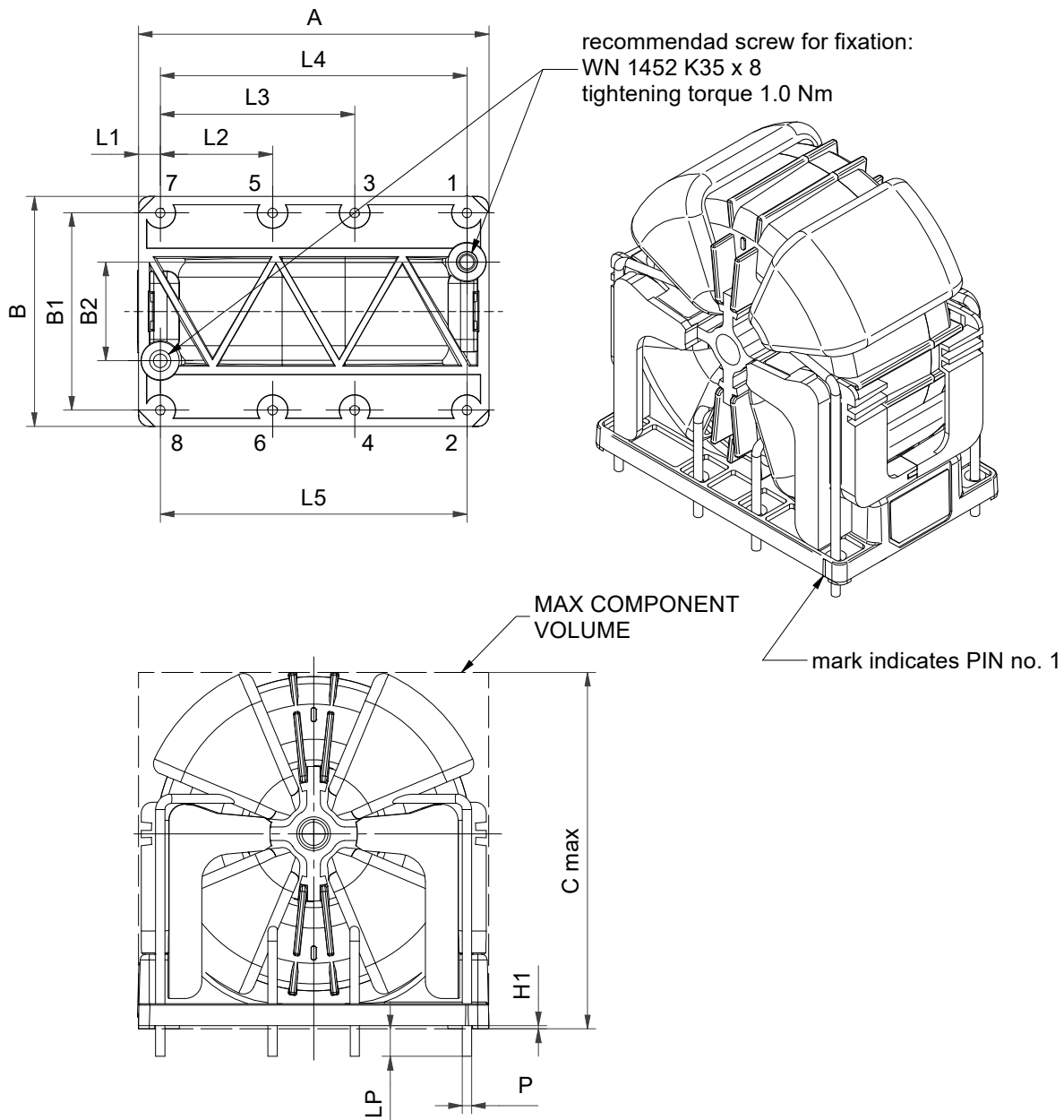


Mechanical Data



| | ∅ A ±0.2 | Cmax | H1 ±0.1 | ∅ E ±0.2 | α ±1° | LP ±0.5 | ∅ P (16A) ±0.1 | ∅ P (25A) ±0.1 | ∅ P (32A) ±0.1 | ∅ P (40A) ±0.1 | ∅ P (50A) ±0.1 |
|----------------------|-------------|------|------------|-------------|----------|------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| RV8140/RV8141-XX-S01 | 66.1 | 41.1 | 0.6 | 59.8 | 15° | 5 | 1.7 | 2.2 | 2.2 | 2.8 | 2.8 |
| RV8140/RV8141-XX-S03 | 66.1 | 53.2 | 0.6 | 59.8 | 15° | 5 | 1.7 | 2.2 | 2.2 | 2.8 | 2.8 |
| RV8140/RV8141-XX-S11 | 62.1 | 37.1 | 0.6 | 55.4 | 15° | 5 | 1.5 | 2.0 | 2.0 | 2.5 | 2.5 |
| RV8140/RV8141-XX-S13 | 62.1 | 47.1 | 0.6 | 55.4 | 15° | 5 | 1.5 | 2.0 | 2.0 | 2.5 | 2.5 |

Mechanical Data



| | Cmax | H1 | B | B1 | B2 | A | L1 | L2 | L3 | L4 | L5 | LP | ∅ P (16A) | ∅ P (25A) | ∅ P (32A) | ∅ P (40A) | ∅ P (50A) |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
| RV8540/RV8541-XX-S02 | 65.5 | ±0.1 | ±0.2 | ±0.4 | ±0.2 | ±0.2 | ±0.1 | ±0.4 | ±0.4 | ±0.4 | ±0.4 | ±0.5 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 |
| RV8540/RV8541-XX-S06 | 65.5 | 0.6 | 30 | 24 | 0 | 64 | 4 | 20.5 | 35.5 | 56 | 46 | 5 | 1.7 | 2.2 | 2.2 | 2.8 | 2.8 |
| RV8540/RV8541-XX-S12 | 59.7 | 0.6 | 38 | 32 | 12 | 60 | 4 | 18.5 | 33.5 | 52 | 46 | 5 | 1.5 | 2.0 | 2.0 | 2.5 | 2.5 |
| RV8540/RV8541-XX-S16 | 59.7 | 0.6 | 27 | 21 | 0 | 60 | 4 | 18.5 | 33.5 | 52 | 42 | 5 | 1.5 | 2.0 | 2.0 | 2.5 | 2.5 |

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