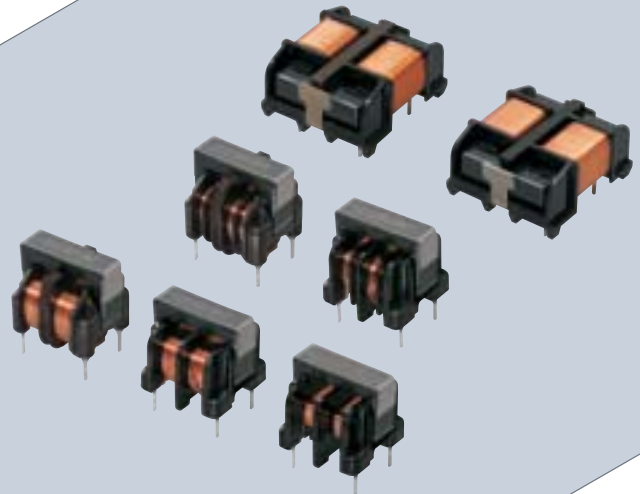




**THE DATASHEET OF
PLY10AN2121R4R2B**



EMI Suppression Filters (EMIFIL[®]) for AC Power Lines





EU RoHS Compliant

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment."
- For more details, please refer to our website 'Murata's Approach for EU RoHS' (<http://www.murata.com/en-eu/support/compliance/rohs>).

Contents

Product specifications are as of October 2016.

EMIFIL® in this catalog is the trademark of Murata Manufacturing Co., Ltd.

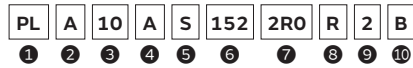
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Please check the MURATA website (<http://www.murata.com/>) if you cannot find a part number in this catalog.

● Part Numbering

AC Line Filters

(Part Number)



① Product ID

| Product ID | |
|------------|-------------------------|
| PL | Common Mode Choke Coils |

② Type

| Code | Type |
|------|-----------------------|
| A | AC Standard |
| H | AC High-frequency |
| Y | AC Hybrid Choke Coils |

③ Applications

| Code | Applications |
|------|--------------|
| 10 | for AC Line |
| 17 | |

④ Structure

| Code | Structure |
|------|-----------------|
| A | Core Vertical |
| B | Core Horizontal |

⑤ Features

| Code | Features |
|------|-----------------------------------|
| S | Safety Recognized |
| N | General Use |
| H | High Inductance |
| V | High Inductance Safety Recognized |

⑥ Inductance

Expressed by three figures. The unit is micro-henry (μH). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two figures.

⑦ Rated Current

Expressed by three-digit alphanumerics. The unit is amperes (A). A decimal point is expressed by the capital letter "R." In this case, all figures are significant digits.

⑧ Winding Mode

| Code | Winding Mode |
|------|-------------------------------------|
| A | Parallel Winding |
| B | Parallel Winding (High-Performance) |
| D | Sectional Winding |
| R | Standard |
| P | Single Layer Winding |

⑨ Lead Dimensions

| Code | Lead Dimensions |
|------|-----------------|
| 2 | 3.5mm |

⑩ Packaging

| Code | Packaging | Series |
|------|-----------|------------|
| B | Bulk | All series |

Outline of EMI Suppression Filter (EMIFIL®) for AC Power Lines

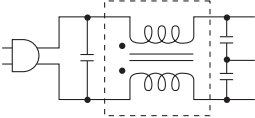




EMI (Electromagnetic Interference) suppression filters for AC power lines eliminate noise entering equipment from commercial power lines or noise generated from electronic equipment.

Common mode chokes, line bypass capacitors, and across the line capacitors are generally used as AC EMI suppression filter devices. In suppressing common mode noise, common mode chokes are the most important devices. Because the characteristics of common mode chokes influence the

performance of the total filter block, MURATA provides two types of common mode chokes (standard type and high frequency type).

A hybrid choke coil is a high-performance EMI suppression device that can suppress both common mode noise and differential mode noise at the same time. It is effective in AC power supplies with active devices for a higher harmonic countermeasure, which tends to emit relatively higher differential mode noise.

Classification of EMI Suppression Filter for AC Power Lines

| Product Name | Appearance | Effective Frequency Range (Hz) | | | | | | Application |
|------------------------|---|--------------------------------|------|----|-----|------|----|--|
| | | 10k | 100k | 1M | 10M | 100M | 1G | |
| Common Mode Choke Coil | Standard Type | | | | | | |  Suppression of general common mode noise |
| |  PLA10 | | | | | | | |
| Common Mode Choke Coil | High Frequency Type | | | | | | | Suppression of common mode noise which contains high frequency noise above 10MHz |
| |  PLH10 | | | | | | | |
| Hybrid Choke Coil |  PLY10 | | | | | | | Suppression of conduction noise in AC power line with active device for higher harmonic countermeasure. Suppression of AC power line noise which contains both common mode noise and differential mode noise. |
| Hybrid Choke Coil |  PLY17 | | | | | | | For AC power supply, AC adaptor. Set for low-profile equipment. |

Outline of EMI Suppression Filter (EMIFIL[®]) for AC Power Lines

Common Mode Choke Coil Standard Winding and Sectional Winding

Standard Winding

End of Winding

Beginning of Winding

High-frequency noise can pass through the Filter easily because both edges of coils are close, as shown above

Standard Winding

Large inductance is available
 →Highly Efficient in Low Frequency

Sectional Winding

End of Winding

Beginning of Winding

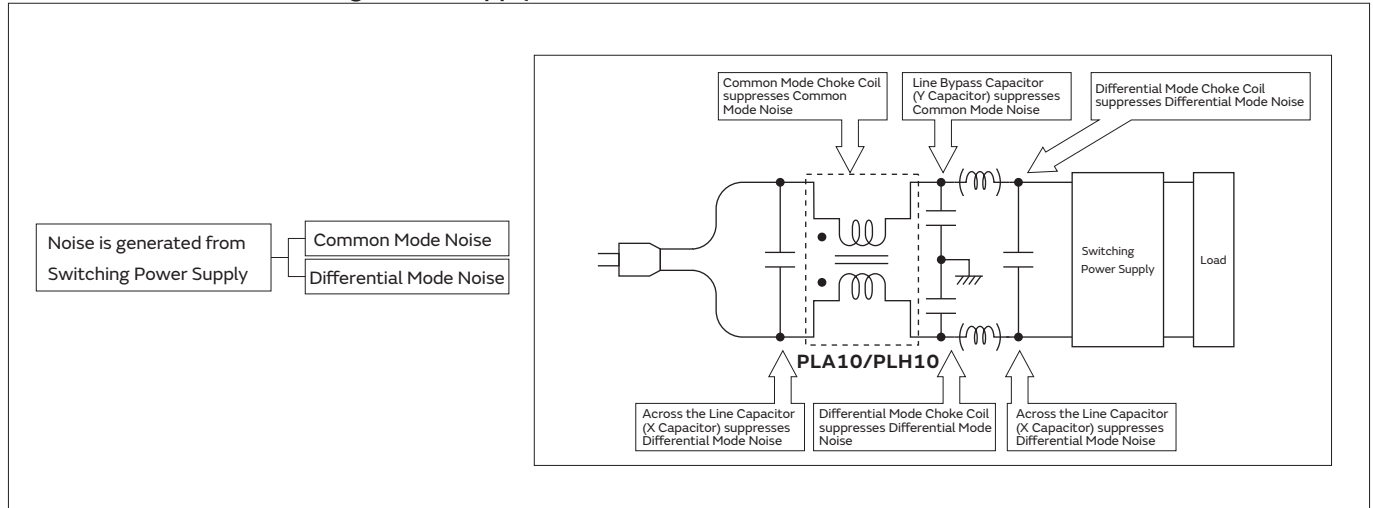
High-frequency noise can hardly pass through the Filter because both edges of coil are not close as shown above

Sectional Winding

Excellent performance in high frequency
 Stray capacity between windings is low

| Frequency (MHz) | Standard Winding (dB) | Sectional Winding (dB) |
|-----------------|-----------------------|------------------------|
| 0.01 | ~20 | ~20 |
| 0.1 | ~40 | ~40 |
| 1 | ~50 | ~30 |
| 10 | ~60 | ~20 |
| 100 | ~70 | ~10 |

Noise Measures for Switching Power Supply



EMI Suppression Filters (EMIFIL®) for AC Power Lines

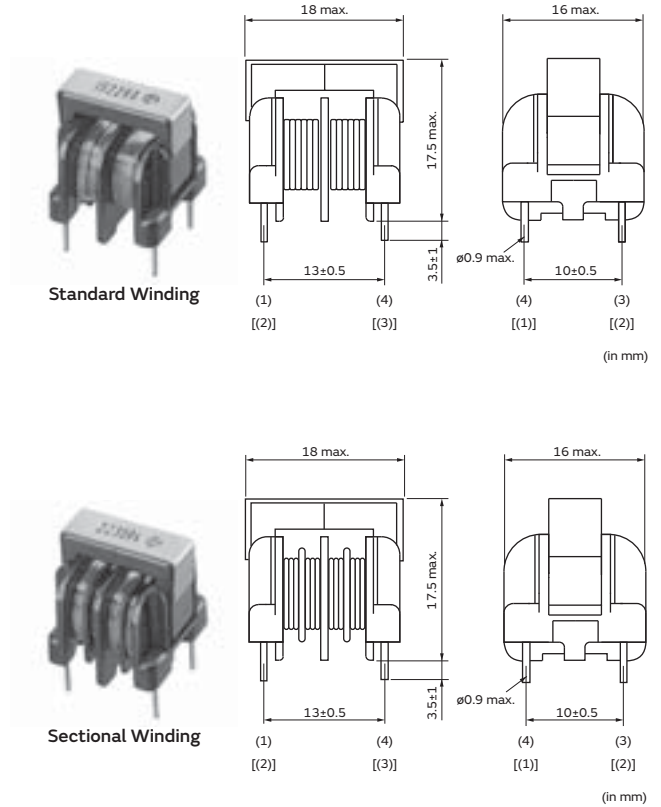
Common Mode Choke Coil

PLA10 Series

The PLA10 series is a compact size AC common mode choke coil. It can obtain a high inductance value in spite of its compact size.

Features

1. Compact and lightweight
2. Low profile in vertical core layout
3. Both a standard winding type and a sectional winding for higher frequency noise is available.



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage | | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------|-------|--------------------------------------|
| | | | (VAC) | (VDC) | |
| PLA10AN1522R0R2B | 1.5 | 2.0 | 300 | 500 | 100 |
| PLA10AN1821R7R2B | 1.8 | 1.7 | 300 | 500 | 100 |
| PLA10AN2221R5R2B | 2.2 | 1.5 | 300 | 500 | 100 |
| PLA10AN3021R3R2B | 3.0 | 1.3 | 300 | 500 | 100 |
| PLA10AN3521R2R2B | 3.5 | 1.2 | 300 | 500 | 100 |
| PLA10AN5521R0R2B | 5.5 | 1.0 | 300 | 500 | 100 |
| PLA10AN7420R8R2B | 7.4 | 0.8 | 300 | 500 | 100 |
| PLA10AN1030R7R2B | 10.0 | 0.7 | 300 | 100 | 100 |
| PLA10AN1230R6R2B | 12.0 | 0.6 | 300 | 100 | 100 |
| PLA10AN2030R5R2B | 20.0 | 0.5 | 300 | 100 | 100 |
| PLA10AN3030R4R2B | 30.0 | 0.4 | 300 | 100 | 100 |
| PLA10AN4330R3R2B | 43.0 | 0.3 | 300 | 100 | 100 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage | | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------|-------|--------------------------------------|
| | | | (VAC) | (VDC) | |
| PLA10AN9012R0D2B | 0.9 | 2.0 | 300 | 500 | 100 |
| PLA10AN1321R7D2B | 1.3 | 1.7 | 300 | 500 | 100 |
| PLA10AN1821R5D2B | 1.8 | 1.5 | 300 | 500 | 100 |
| PLA10AN2021R3D2B | 2.0 | 1.3 | 300 | 500 | 100 |

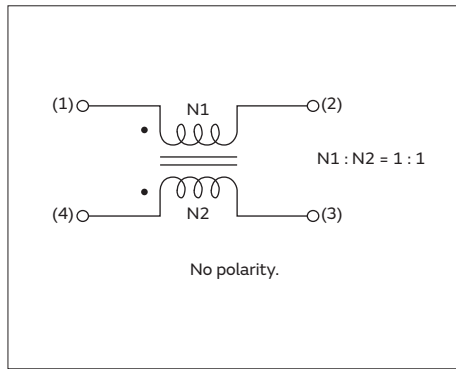
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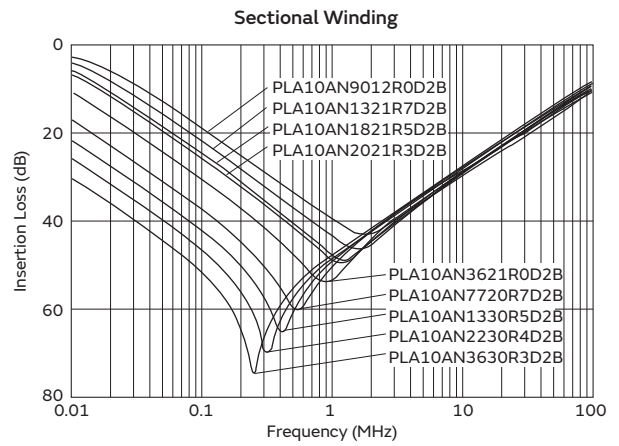
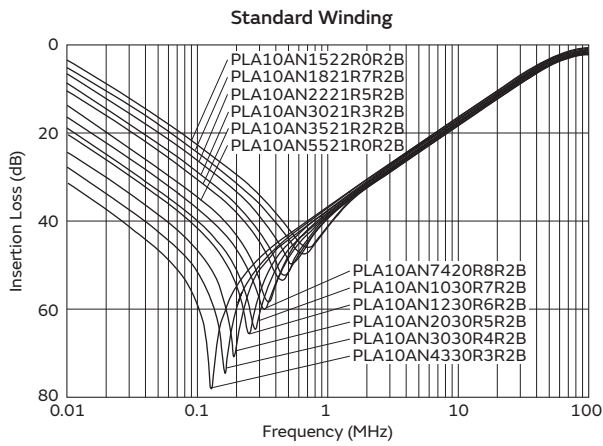
| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage | | Insulation Resistance (min.) (M ohm) |
|------------------|--|----------------------|---------------|-------|--|
| | | | (VAC) | (VDC) | |
| PLA10AN3621R0D2B | 3.6 | 1.0 | 300 | 500 | 100 |
| PLA10AN7720R7D2B | 7.7 | 0.7 | 300 | 100 | 100 |
| PLA10AN1330R5D2B | 13.0 | 0.5 | 300 | 100 | 100 |
| PLA10AN2230R4D2B | 22.0 | 0.4 | 300 | 100 | 100 |
| PLA10AN3630R3D2B | 36.0 | 0.3 | 300 | 100 | 100 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram



Insertion Loss - Frequency Characteristics



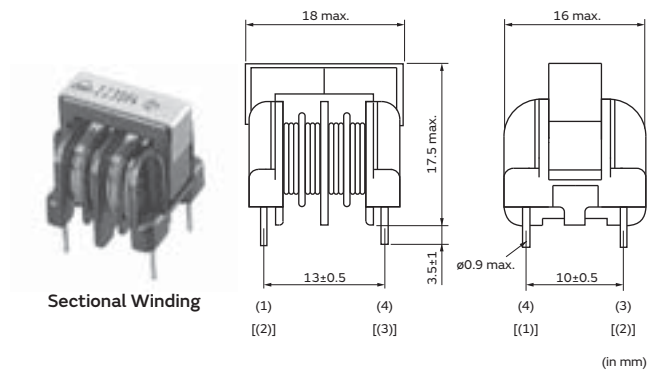
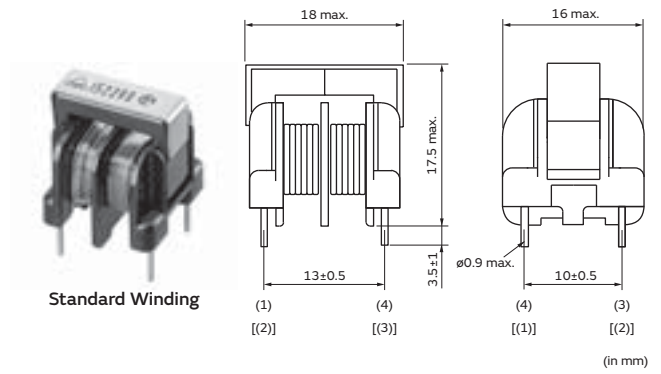
PLA10 Series (Safety Standard Recognized)

Features

1. Compact and lightweight
2. Low profile in vertical core layout
3. Both a standard winding and a sectional winding for higher frequency noise is available.
4. Safety standards: EN60065

Applications

Noise suppression of AC power lines



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage (VAC) | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------------|--------------------------------------|
| PLA10AS1522R0R2B | 1.5 | 2.0 | 250 | 100 |
| PLA10AS1821R7R2B | 1.8 | 1.7 | 250 | 100 |
| PLA10AS2221R5R2B | 2.2 | 1.5 | 250 | 100 |
| PLA10AS3021R3R2B | 3.0 | 1.3 | 250 | 100 |
| PLA10AS3521R2R2B | 3.5 | 1.2 | 250 | 100 |
| PLA10AS5521R0R2B | 5.5 | 1.0 | 250 | 100 |
| PLA10AS7420R8R2B | 7.4 | 0.8 | 250 | 100 |
| PLA10AS1030R7R2B | 10.0 | 0.7 | 250 | 100 |
| PLA10AS1230R6R2B | 12.0 | 0.6 | 250 | 100 |
| PLA10AS2030R5R2B | 20.0 | 0.5 | 250 | 100 |
| PLA10AS3030R4R2B | 30.0 | 0.4 | 250 | 100 |
| PLA10AS4330R3R2B | 43.0 | 0.3 | 250 | 100 |

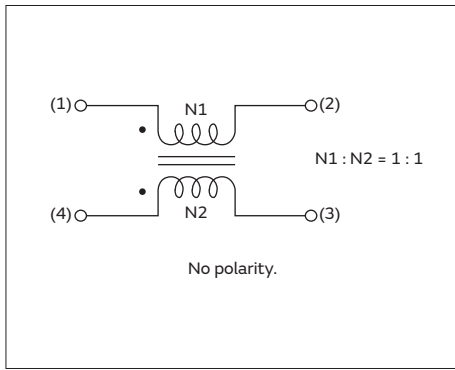
Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

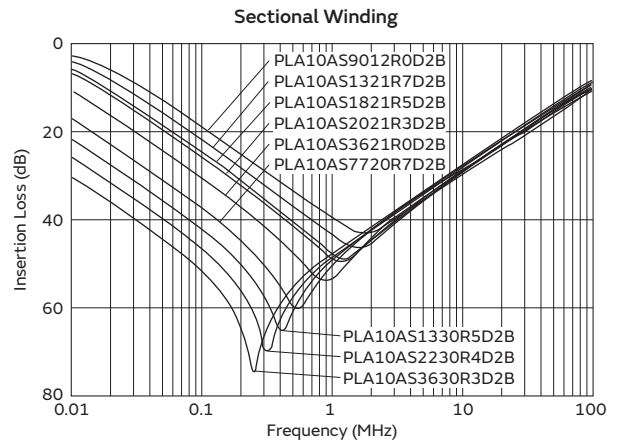
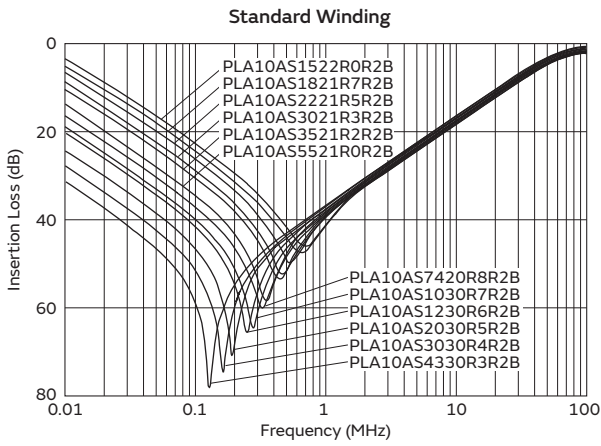
| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage (VAC) | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------------|--------------------------------------|
| PLA10AS9012R0D2B | 0.9 | 2.0 | 250 | 100 |
| PLA10AS1321R7D2B | 1.3 | 1.7 | 250 | 100 |
| PLA10AS1821R5D2B | 1.8 | 1.5 | 250 | 100 |
| PLA10AS2021R3D2B | 2.0 | 1.3 | 250 | 100 |
| PLA10AS3621R0D2B | 3.6 | 1.0 | 250 | 100 |
| PLA10AS7720R7D2B | 7.7 | 0.7 | 250 | 100 |
| PLA10AS1330R5D2B | 13.0 | 0.5 | 250 | 100 |
| PLA10AS2230R4D2B | 22.0 | 0.4 | 250 | 100 |
| PLA10AS3630R3D2B | 36.0 | 0.3 | 250 | 100 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram



Insertion Loss - Frequency Characteristics



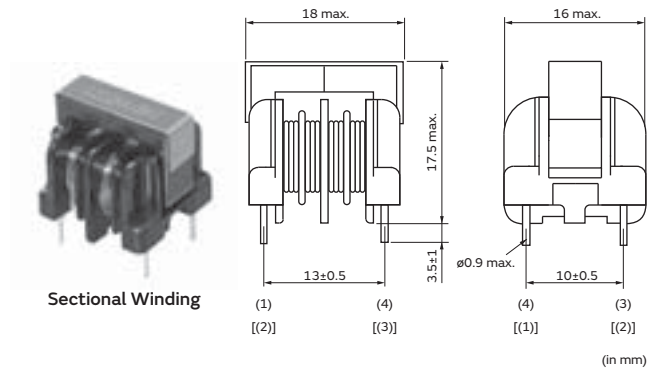
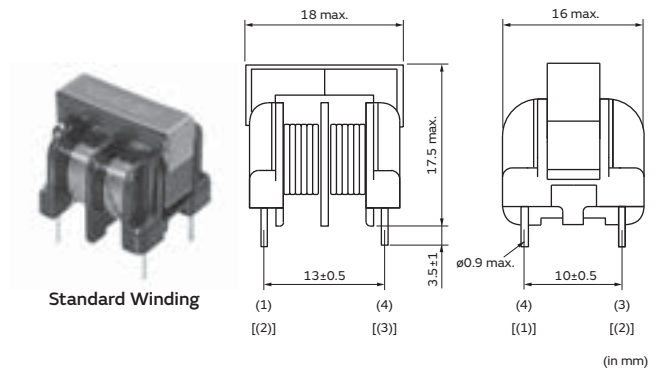
PLA10 Series High Inductance

The PLA10 series is a compact size AC common mode choke coil. It can obtain a high inductance value in spite of its compact size.

Features

1. Compact and lightweight
2. Low profile in vertical core layout
3. This is high inductance choke coil by high permeability ferrite core.

The inductance of new (high inductance) series is increased 100% compared with our existing products.



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage | | Insulation Resistance (min.) (M ohm) |
|------------------|--|----------------------|---------------|-------|--|
| | | | (VAC) | (VDC) | |
| PLA10AH2222R2R2B | 2.2 | 2.2 | 300 | 500 | 100 |
| PLA10AH3321R8R2B | 3.3 | 1.8 | 300 | 500 | 100 |
| PLA10AH5321R4R2B | 5.3 | 1.4 | 300 | 500 | 100 |
| PLA10AH1031R0R2B | 10.0 | 1.0 | 300 | 500 | 100 |
| PLA10AH1330R8R2B | 13.0 | 0.8 | 300 | 100 | 100 |
| PLA10AH1830R7R2B | 18.0 | 0.7 | 300 | 100 | 100 |
| PLA10AH2830R6R2B | 28.0 | 0.6 | 300 | 100 | 100 |
| PLA10AH4130R5R2B | 41.0 | 0.5 | 300 | 100 | 100 |

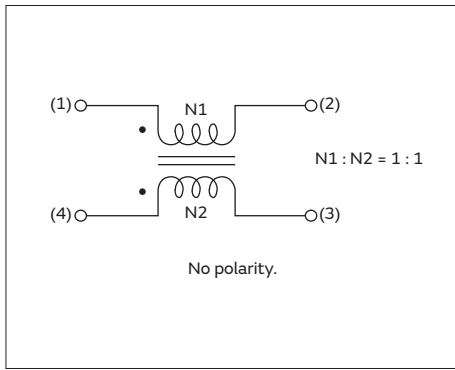
Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

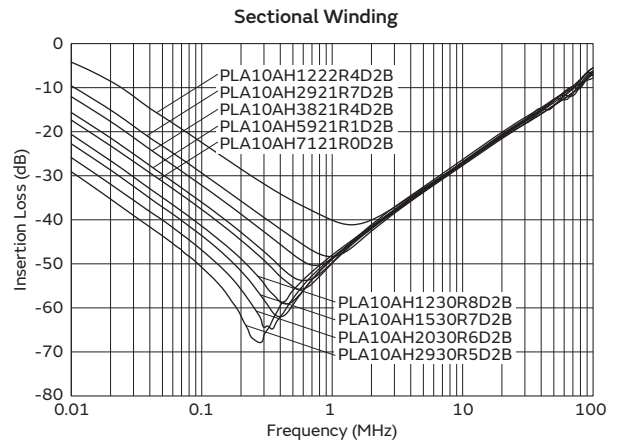
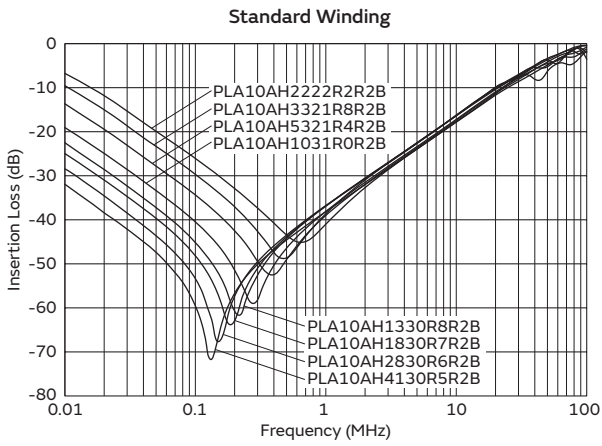
| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage | | Insulation Resistance (min.) (M ohm) |
|------------------|--|----------------------|---------------|-------|--|
| | | | (VAC) | (VDC) | |
| PLA10AH1222R4D2B | 1.2 | 2.4 | 300 | 500 | 100 |
| PLA10AH2921R7D2B | 2.9 | 1.7 | 300 | 500 | 100 |
| PLA10AH3821R4D2B | 3.8 | 1.4 | 300 | 500 | 100 |
| PLA10AH5921R1D2B | 5.9 | 1.1 | 300 | 500 | 100 |
| PLA10AH7121R0D2B | 7.1 | 1.0 | 300 | 500 | 100 |
| PLA10AH1230R8D2B | 12.0 | 0.8 | 300 | 100 | 100 |
| PLA10AH1530R7D2B | 15.0 | 0.7 | 300 | 100 | 100 |
| PLA10AH2030R6D2B | 20.0 | 0.6 | 300 | 100 | 100 |
| PLA10AH2930R5D2B | 29.0 | 0.5 | 300 | 100 | 100 |

Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram



Insertion Loss - Frequency Characteristics

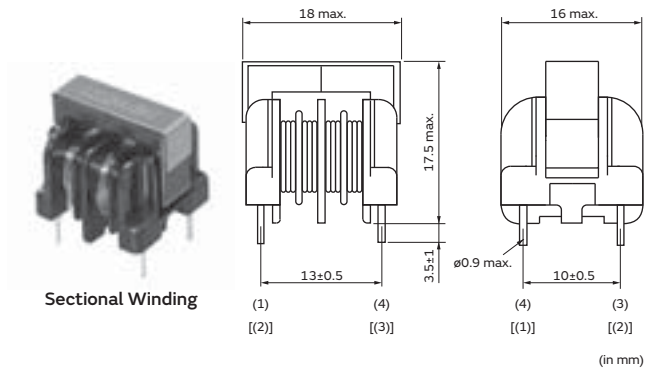
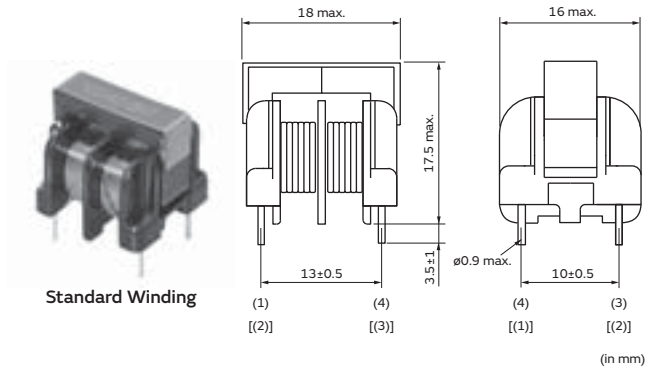


PLA10 Series High Inductance (Safety Standard Recognized)

The PLA10 series is a compact size AC common mode choke coil. It can obtain a high inductance value in spite of its compact size.

Features

1. Compact and lightweight
2. Low profile in vertical core layout
3. This is high inductance choke coil by high permeability ferrite core.
 The inductance of new (high inductance) series is increased 100% compared with our existing products.
4. Safety standards: EN60065



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage (VAC) | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------------|--------------------------------------|
| PLA10AV2222R2R2B | 2.2 | 2.2 | 250 | 100 |
| PLA10AV3321R8R2B | 3.3 | 1.8 | 250 | 100 |
| PLA10AV5321R4R2B | 5.3 | 1.4 | 250 | 100 |
| PLA10AV1031R0R2B | 10.0 | 1.0 | 250 | 100 |
| PLA10AV1330R8R2B | 13.0 | 0.8 | 250 | 100 |
| PLA10AV1830R7R2B | 18.0 | 0.7 | 250 | 100 |
| PLA10AV2830R6R2B | 28.0 | 0.6 | 250 | 100 |
| PLA10AV4130R5R2B | 41.0 | 0.5 | 250 | 100 |

Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

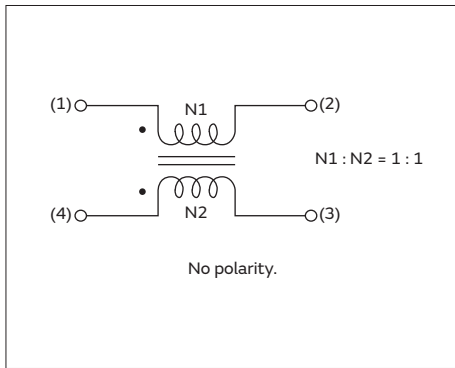
Sectional Winding

| Part Number | Common Mode Inductance (min.) (mH) | Rated Current (A) | Rated Voltage (VAC) | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------------|--------------------------------------|
| PLA10AV1222R4D2B | 1.2 | 2.4 | 250 | 100 |
| PLA10AV2921R7D2B | 2.9 | 1.7 | 250 | 100 |
| PLA10AV3821R4D2B | 3.8 | 1.4 | 250 | 100 |
| PLA10AV5921R1D2B | 5.9 | 1.1 | 250 | 100 |
| PLA10AV7121R0D2B | 7.1 | 1.0 | 250 | 100 |
| PLA10AV1230R8D2B | 12.0 | 0.8 | 250 | 100 |
| PLA10AV1530R7D2B | 15.0 | 0.7 | 250 | 100 |
| PLA10AV2030R6D2B | 20.0 | 0.6 | 250 | 100 |
| PLA10AV2930R5D2B | 29.0 | 0.5 | 250 | 100 |

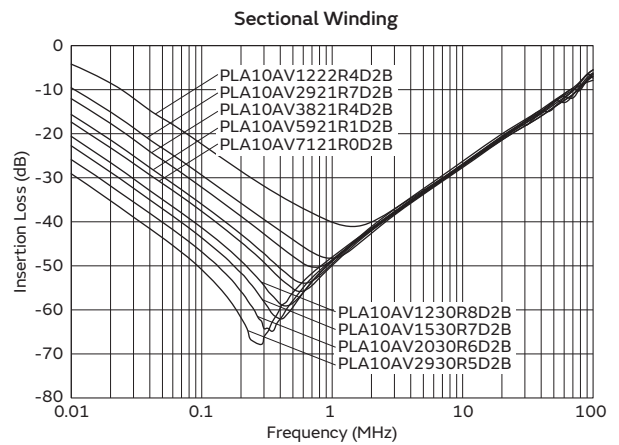
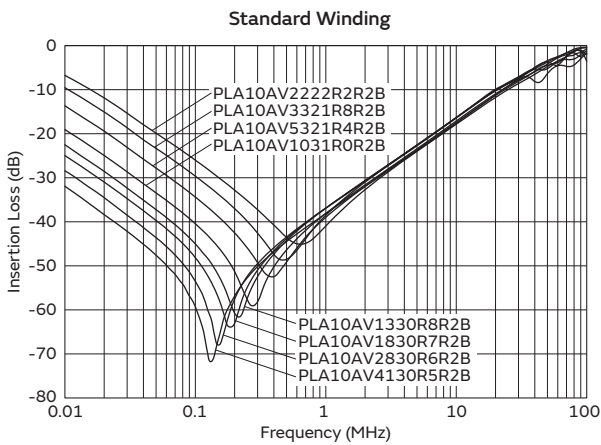
Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

1

Equivalent Circuit Diagram



Insertion Loss - Frequency Characteristics



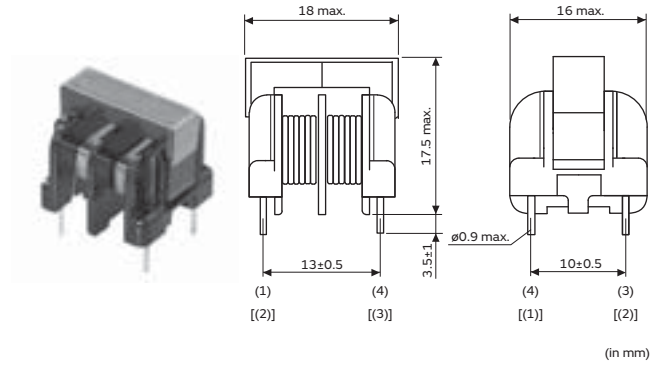
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PLH10 Series

The PLH10 series is a common mode choke coil for high frequency use. The same dimensions as the PLA10 series enables flexible design.

Features

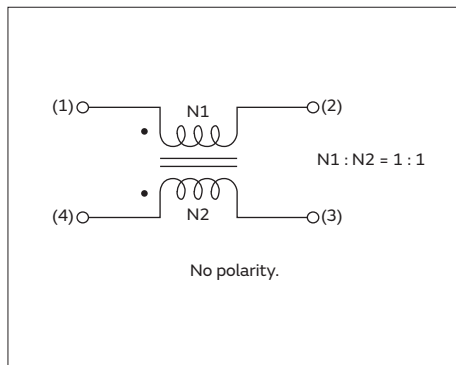
1. High performance in high frequency range
2. Compact and lightweight
3. Low profile in vertical core layout



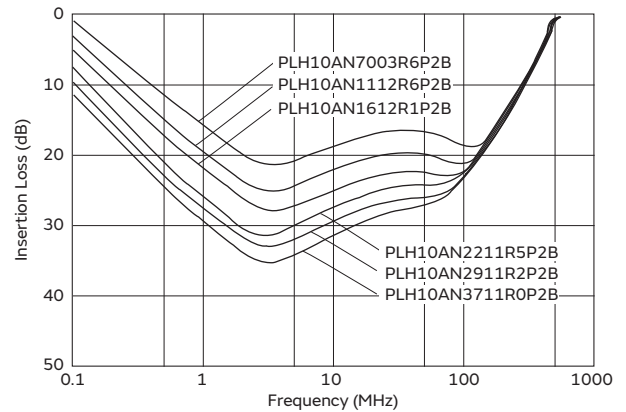
| Part Number | Common Mode Inductance (min.) (μ H) | Rated Current (A) | Rated Voltage | | Insulation Resistance (min.) (M ohm) |
|------------------|--|----------------------|---------------|-------|--|
| | | | (VAC) | (VDC) | |
| PLH10AN7003R6P2B | 70 | 3.6 | 300 | 500 | 100 |
| PLH10AN1112R6P2B | 110 | 2.6 | 300 | 500 | 100 |
| PLH10AN1612R1P2B | 160 | 2.1 | 300 | 500 | 100 |
| PLH10AN2211R5P2B | 220 | 1.5 | 300 | 100 | 100 |
| PLH10AN2911R2P2B | 290 | 1.2 | 300 | 100 | 100 |
| PLH10AN3711R0P2B | 370 | 1.0 | 300 | 100 | 100 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram



Insertion Loss - Frequency Characteristics



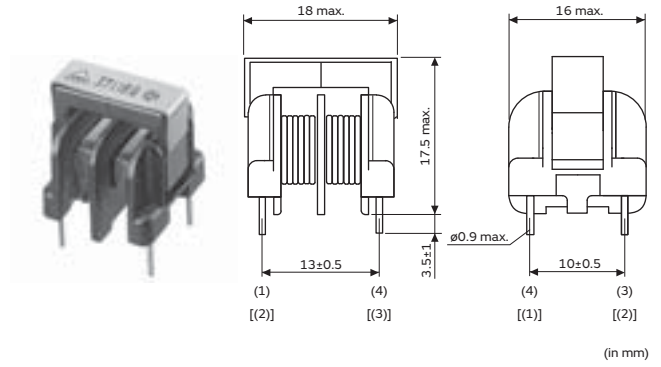
PLH10 Series (Safety Standard Recognized)

Features

1. High performance in high frequency range
2. Compact and lightweight
3. Low profile in vertical core layout
4. Safety standards: EN60065

Applications

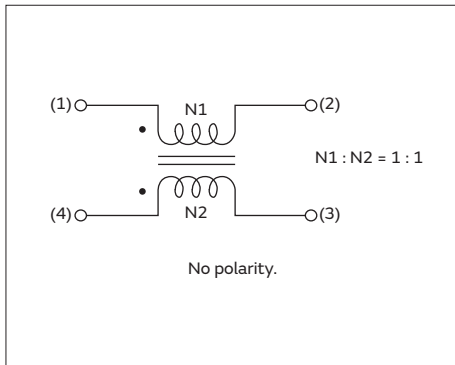
Suppressing radiation noise in switching power supply and inverter (AC-DC converter)



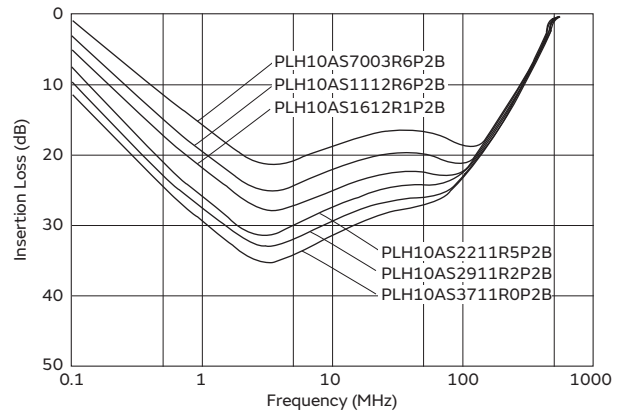
| Part Number | Common Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) | Insulation Resistance (min.) (M ohm) |
|------------------|------------------------------------|-------------------|---------------------|--------------------------------------|
| PLH10AS7003R6P2B | 70 | 3.6 | 250 | 100 |
| PLH10AS1112R6P2B | 110 | 2.6 | 250 | 100 |
| PLH10AS1612R1P2B | 160 | 2.1 | 250 | 100 |
| PLH10AS2211R5P2B | 220 | 1.5 | 250 | 100 |
| PLH10AS2911R2P2B | 290 | 1.2 | 250 | 100 |
| PLH10AS3711R0P2B | 370 | 1.0 | 250 | 100 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram



Insertion Loss - Frequency Characteristics



EMI Suppression Filters (EMIFIL®) for AC Power Lines

Hybrid Choke Coil

PLY10 Series

The PLY10 is a compact and high-performance hybrid choke coil that can handle differential mode noise caused by the harmonics currents regulation circuit as well as common mode noise. It can handle noise problems much more compactly than a combination of a conventional common mode choke coil and a differential mode choke coil.

Features

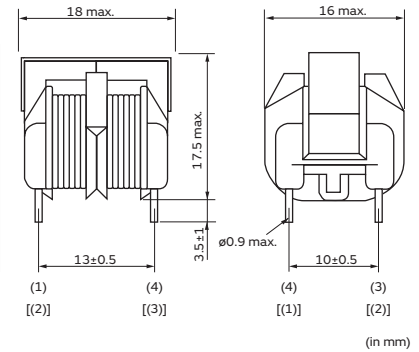
1. PLY10 has both functions of a common mode choke coil and a differential mode choke coil in its compact body.
2. Low profile in vertical core layout
3. PLY10 has the same pin layout as a general common mode choke coil which enables it to replace conventional components.
4. Both a standard winding and a sectional winding for higher frequency noise is available.

EMI Problem for harmonics currents regulation

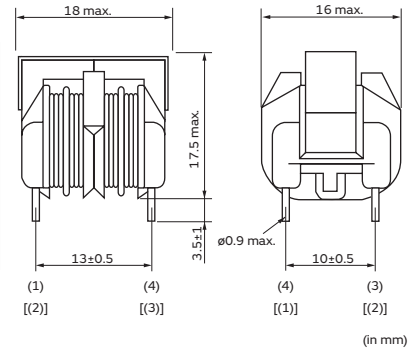
There are some methods that meet harmonics currents regulations (IEC1000-3, EN60555-2) such as an active filter and one converter. However, they cause new EMI problems of differential mode noise because they use active components. For that reason, additional filter components to meet differential mode noise must be applied.



Standard Winding



Sectional Winding



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (µH) | Rated Current (A) | Rated Voltage | |
|------------------|--|--|----------------------|---------------|-------|
| | | | | (VAC) | (VDC) |
| PLY10AN9012R0R2B | 0.9 | 65 | 2.0 | 300 | 500 |
| PLY10AN1121R8R2B | 1.1 | 90 | 1.8 | 300 | 500 |
| PLY10AN1521R6R2B | 1.5 | 110 | 1.6 | 300 | 500 |
| PLY10AN2121R4R2B | 2.1 | 150 | 1.4 | 300 | 500 |
| PLY10AN2821R2R2B | 2.8 | 190 | 1.2 | 300 | 500 |
| PLY10AN4321R0R2B | 4.3 | 300 | 1.0 | 300 | 500 |
| PLY10AN6220R8R2B | 6.2 | 400 | 0.8 | 300 | 50 |
| PLY10AN8720R7R2B | 8.7 | 530 | 0.7 | 300 | 50 |
| PLY10AN9920R6R2B | 9.9 | 690 | 0.6 | 300 | 50 |
| PLY10AN1430R5R2B | 14.0 | 1000 | 0.5 | 300 | 50 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (µH) | Rated Current (A) | Rated Voltage | |
|------------------|--|--|----------------------|---------------|-------|
| | | | | (VAC) | (VDC) |
| PLY10AN7012R0D2B | 0.7 | 50 | 2.0 | 300 | 500 |
| PLY10AN1121R7D2B | 1.1 | 65 | 1.7 | 300 | 500 |

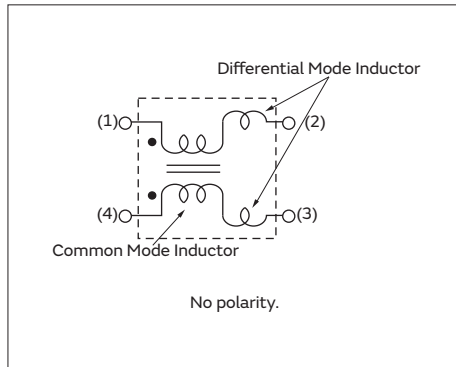
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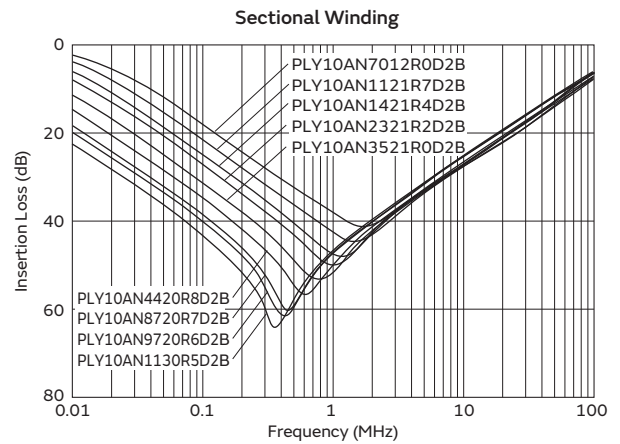
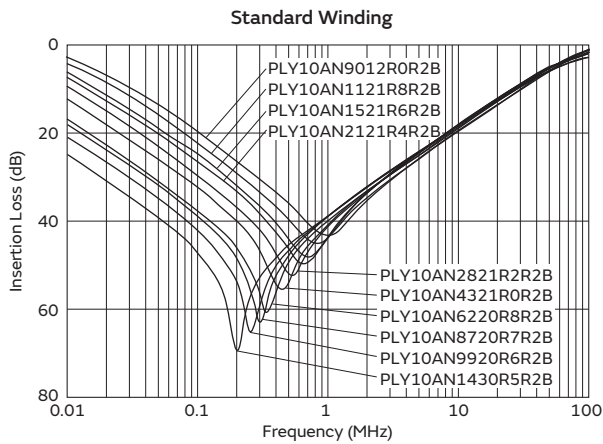
| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage | |
|------------------|--|--|----------------------|---------------|-------|
| | | | | (VAC) | (VDC) |
| PLY10AN1421R4D2B | 1.4 | 110 | 1.4 | 300 | 500 |
| PLY10AN2321R2D2B | 2.3 | 160 | 1.2 | 300 | 500 |
| PLY10AN3521R0D2B | 3.5 | 240 | 1.0 | 300 | 500 |
| PLY10AN4420R8D2B | 4.4 | 320 | 0.8 | 300 | 50 |
| PLY10AN8720R7D2B | 8.7 | 500 | 0.7 | 300 | 50 |
| PLY10AN9720R6D2B | 9.7 | 670 | 0.6 | 300 | 50 |
| PLY10AN1130R5D2B | 11.0 | 840 | 0.5 | 300 | 50 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

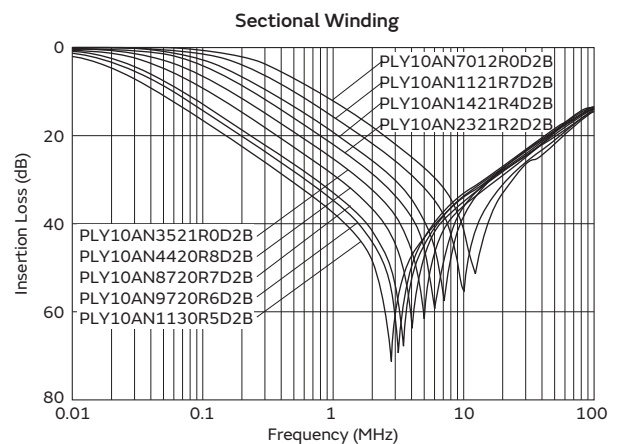
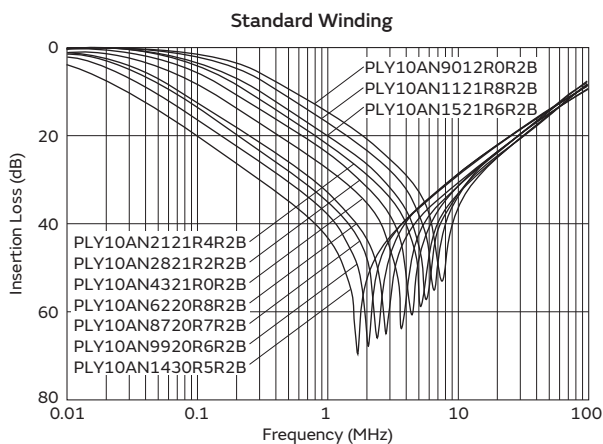
Equivalent Circuit Diagram



Common Mode Insertion Loss - Frequency Characteristics



Differential Mode Insertion Loss - Frequency Characteristics



PLY10 Series (Safety Standard Recognized)

The PLY10 is a compact and high-performance hybrid choke coil that can handle differential mode noise caused by the harmonics currents regulation circuit as well as common mode noise. It can handle noise problems much more compactly than a combination of a conventional common mode choke coil and a differential mode choke coil.

Features

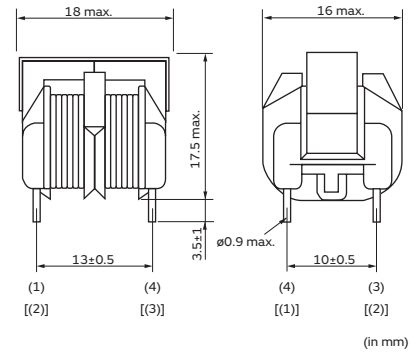
1. PLY10 has both functions of a common mode choke coil and a differential mode choke coil in its compact body.
2. Low profile in vertical core layout
3. PLY10 has the same pin layout as a general common mode choke coil which enables it to replace conventional components.
4. Safety standards: EN60065

EMI Problem for harmonics currents regulation

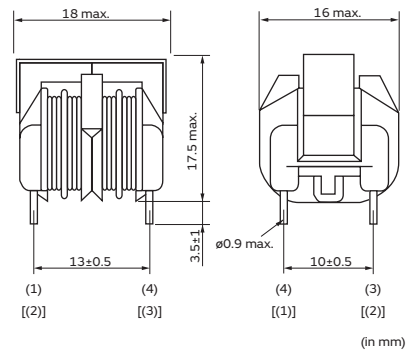
There are some methods that meet harmonics currents regulations (IEC1000-3, EN60555-2) such as an active filter and one converter. However, they cause new EMI problems of differential mode noise because they use active components. For that reason, additional filter components to meet differential mode noise must be applied.



Standard Winding



Sectional Winding



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|------------------------------------|------------------------------------|-------------------|---------------------|
| PLY10AS9012R0R2B | 0.9 | 65 | 2.0 | 300 |
| PLY10AS1121R8R2B | 1.1 | 90 | 1.8 | 300 |
| PLY10AS1521R6R2B | 1.5 | 110 | 1.6 | 300 |
| PLY10AS2121R4R2B | 2.1 | 150 | 1.4 | 300 |
| PLY10AS2821R2R2B | 2.8 | 190 | 1.2 | 300 |
| PLY10AS4321R0R2B | 4.3 | 300 | 1.0 | 300 |
| PLY10AS6220R8R2B | 6.2 | 400 | 0.8 | 300 |
| PLY10AS8720R7R2B | 8.7 | 530 | 0.7 | 300 |
| PLY10AS9920R6R2B | 9.9 | 690 | 0.6 | 300 |
| PLY10AS1430R5R2B | 14.0 | 1000 | 0.5 | 300 |

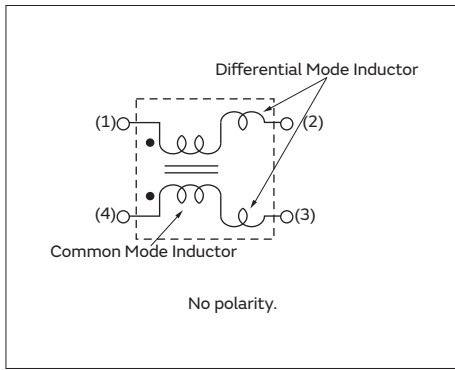
Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

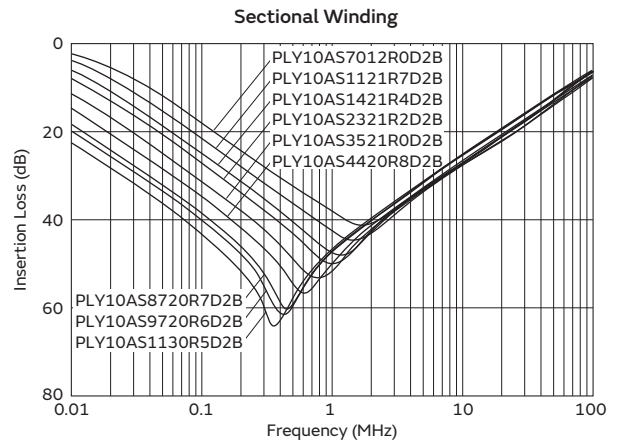
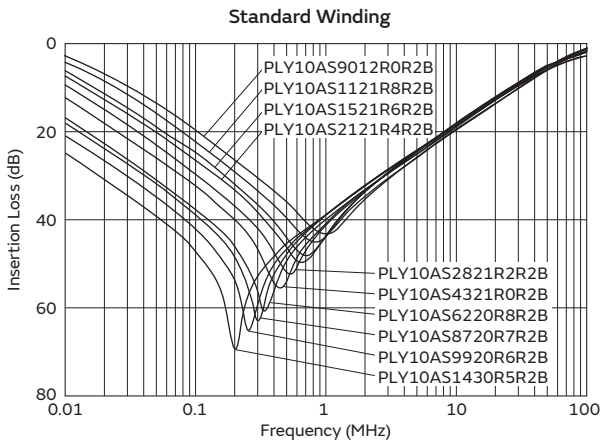
| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|------------------------------------|------------------------------------|-------------------|---------------------|
| PLY10AS7012R0D2B | 0.7 | 50 | 2.0 | 300 |
| PLY10AS1121R7D2B | 1.1 | 65 | 1.7 | 300 |
| PLY10AS1421R4D2B | 1.4 | 110 | 1.4 | 300 |
| PLY10AS2321R2D2B | 2.3 | 160 | 1.2 | 300 |
| PLY10AS3521R0D2B | 3.5 | 240 | 1.0 | 300 |
| PLY10AS4420R8D2B | 4.4 | 320 | 0.8 | 300 |
| PLY10AS8720R7D2B | 8.7 | 500 | 0.7 | 300 |
| PLY10AS9720R6D2B | 9.7 | 670 | 0.6 | 300 |
| PLY10AS1130R5D2B | 11.0 | 840 | 0.5 | 300 |

Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

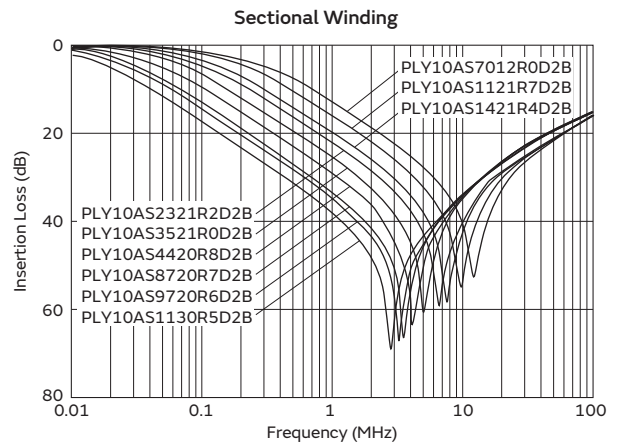
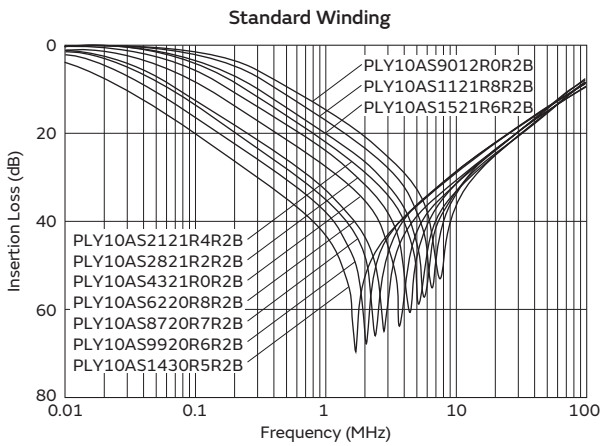
Equivalent Circuit Diagram



Common Mode Insertion Loss - Frequency Characteristics



Differential Mode Insertion Loss - Frequency Characteristics



PLY10 Series High Inductance

The PLY10 is a compact and high-performance hybrid choke coil that can handle differential mode noise caused by the harmonics currents regulation circuit as well as common mode noise. It can handle noise problems much more compactly than a combination of a conventional common mode choke coil and a differential mode choke coil.

Features

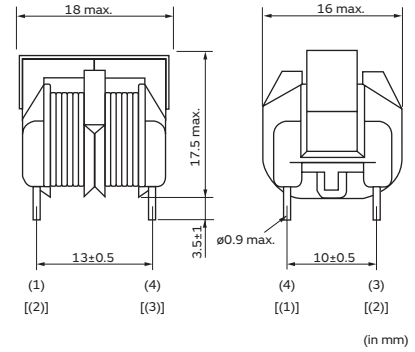
1. PLY10 has both functions of a common mode choke coil and a differential mode choke coil in its compact body.
2. Low profile in vertical core layout.
3. PLY10 has the same pin layout as a general common mode choke coil which enables it to replace conventional components.
4. This is high inductance choke coil by high permeability ferrite core.
 The inductance of new (high inductance) series is increased 100% compared with our existing products.

EMI Problem for harmonics currents regulation

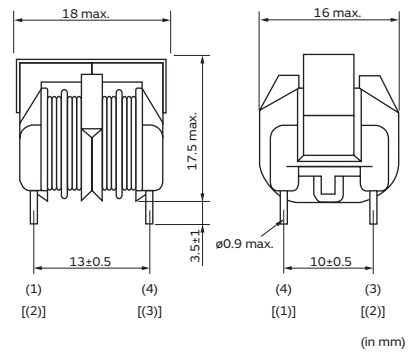
There are some methods that meet harmonics currents regulations (IEC1000-3, EN60555-2) such as an active filter and one converter. However, they cause new EMI problems of differential mode noise because they use active components. For that reason, additional filter components to meet differential mode noise must be applied.



Standard Winding



Sectional Winding



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (µH) | Rated Current (A) | Rated Voltage | |
|------------------|--|--|----------------------|---------------|-------|
| | | | | (VAC) | (VDC) |
| PLY10AH2222R1R2B | 2.2 | 90 | 2.1 | 300 | 500 |
| PLY10AH3321R7R2B | 3.3 | 130 | 1.7 | 300 | 500 |
| PLY10AH5121R3R2B | 5.1 | 210 | 1.3 | 300 | 500 |
| PLY10AH1031R0R2B | 10.0 | 390 | 1.0 | 300 | 500 |
| PLY10AH1430R8R2B | 14.0 | 590 | 0.8 | 300 | 50 |
| PLY10AH2030R7R2B | 20.0 | 820 | 0.7 | 300 | 50 |
| PLY10AH2530R6R2B | 25.0 | 1000 | 0.6 | 300 | 50 |
| PLY10AH3730R5R2B | 37.0 | 1500 | 0.5 | 300 | 50 |

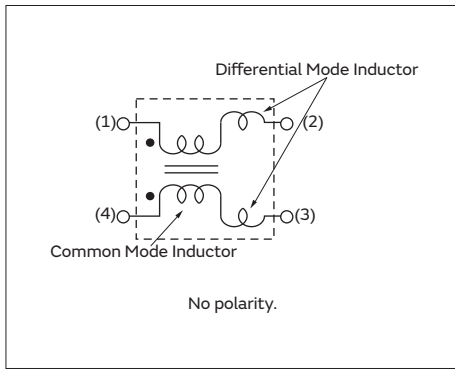
Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

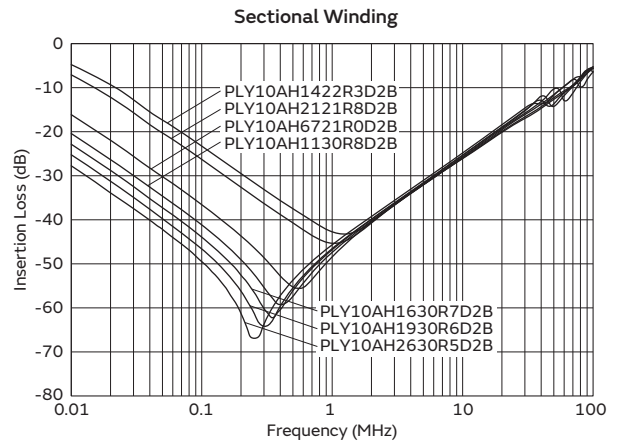
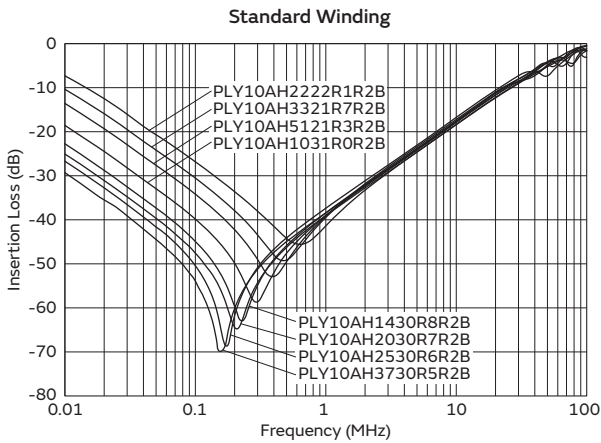
| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (µH) | Rated Current (A) | Rated Voltage | |
|------------------|--|--|----------------------|---------------|-------|
| | | | | (VAC) | (VDC) |
| PLY10AH1422R3D2B | 1.4 | 50 | 2.3 | 300 | 500 |
| PLY10AH2121R8D2B | 2.1 | 80 | 1.8 | 300 | 500 |
| PLY10AH6721R0D2B | 6.7 | 260 | 1.0 | 300 | 500 |
| PLY10AH1130R8D2B | 11.0 | 460 | 0.8 | 300 | 50 |
| PLY10AH1630R7D2B | 16.0 | 650 | 0.7 | 300 | 50 |
| PLY10AH1930R6D2B | 19.0 | 760 | 0.6 | 300 | 50 |
| PLY10AH2630R5D2B | 26.0 | 1000 | 0.5 | 300 | 50 |

Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

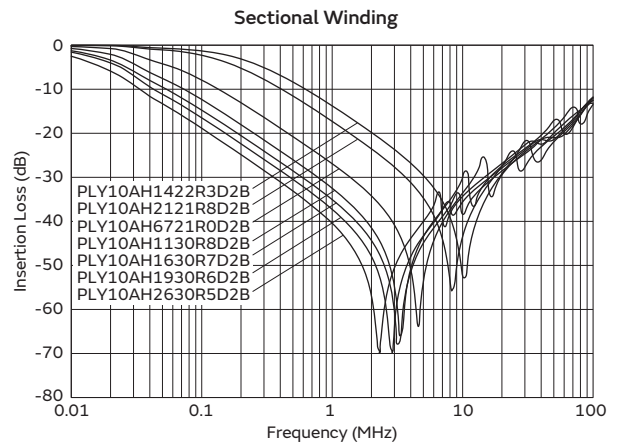
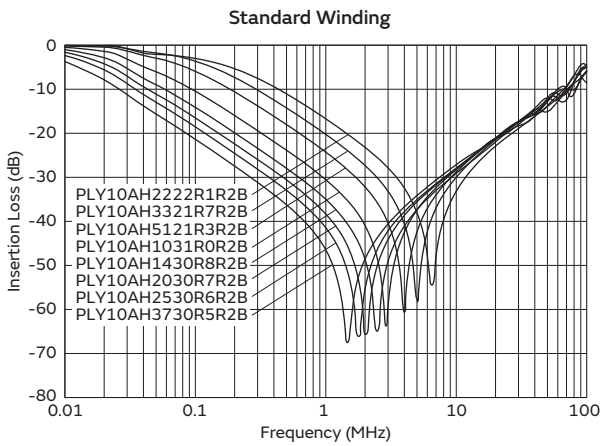
Equivalent Circuit Diagram



Common Mode Insertion Loss - Frequency Characteristics



Differential Mode Insertion Loss - Frequency Characteristics



PLY10 Series High Inductance (Safety Standard Recognized)

The PLY10 is a compact and high-performance hybrid choke coil that can handle differential mode noise caused by the harmonics currents regulation circuit as well as common mode noise. It can handle noise problems much more compactly than a combination of a conventional common mode choke coil and a differential mode choke coil.

Features

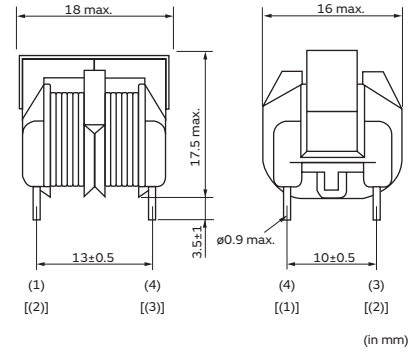
1. PLY10 has both functions of a common mode choke coil and a differential mode choke coil in its compact body.
2. Low profile in vertical core layout.
3. PLY10 has the same pin layout as a general common mode choke coil which enables it to replace conventional components.
4. This is high inductance choke coil by high permeability ferrite core.
 The inductance of new (high inductance) series is increased 100% compared with our existing products.
5. Safety standards: EN60065

EMI Problem for harmonics currents regulation

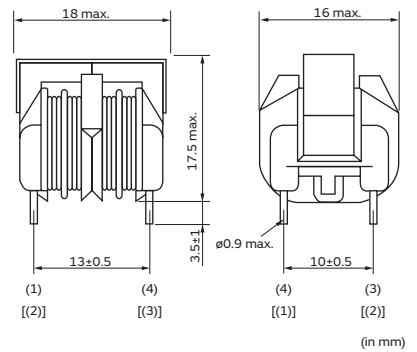
There are some methods that meet harmonics currents regulations (IEC1000-3, EN60555-2) such as an active filter and one converter. However, they cause new EMI problems of differential mode noise because they use active components. For that reason, additional filter components to meet differential mode noise must be applied.



Standard Winding



Sectional Winding



Standard Winding

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|------------------------------------|------------------------------------|-------------------|---------------------|
| PLY10AV2222R1R2B | 2.2 | 90 | 2.1 | 300 |
| PLY10AV3321R7R2B | 3.3 | 130 | 1.7 | 300 |
| PLY10AV5121R3R2B | 5.1 | 210 | 1.3 | 300 |
| PLY10AV1031R0R2B | 10.0 | 390 | 1.0 | 300 |
| PLY10AV1430R8R2B | 14.0 | 590 | 0.8 | 300 |
| PLY10AV2030R7R2B | 20.0 | 820 | 0.7 | 300 |
| PLY10AV2530R6R2B | 25.0 | 1000 | 0.6 | 300 |
| PLY10AV3730R5R2B | 37.0 | 1500 | 0.5 | 300 |

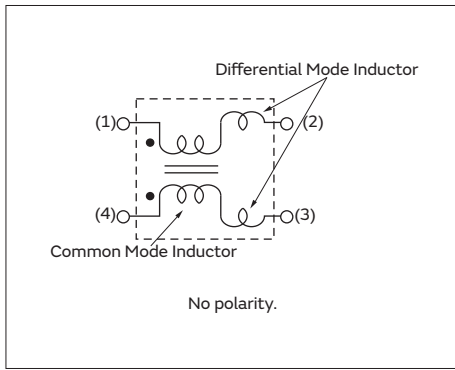
Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Sectional Winding

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|------------------------------------|------------------------------------|-------------------|---------------------|
| PLY10AV1422R3D2B | 1.4 | 50 | 2.3 | 300 |
| PLY10AV2121R8D2B | 2.1 | 80 | 1.8 | 300 |
| PLY10AV6721R0D2B | 6.7 | 260 | 1.0 | 300 |
| PLY10AV1130R8D2B | 11.0 | 460 | 0.8 | 300 |
| PLY10AV1630R7D2B | 16.0 | 650 | 0.7 | 300 |
| PLY10AV1930R6D2B | 19.0 | 760 | 0.6 | 300 |
| PLY10AV2630R5D2B | 26.0 | 1000 | 0.5 | 300 |

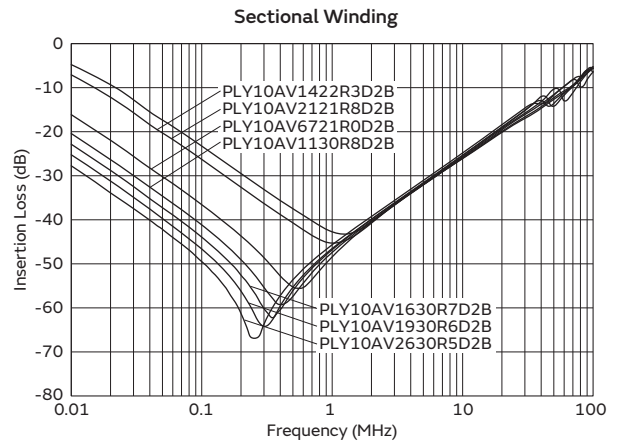
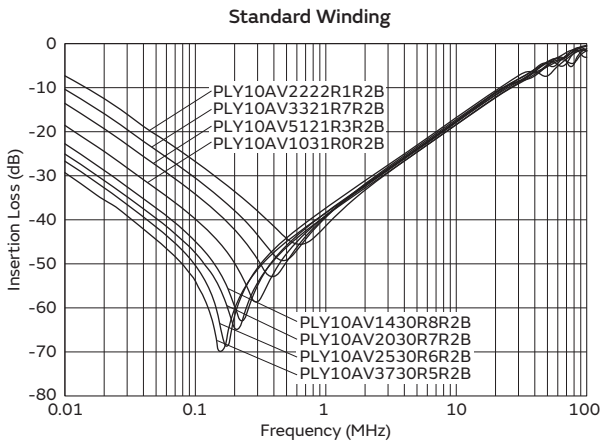
Operating Temperature Range: -25°C to 55°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram

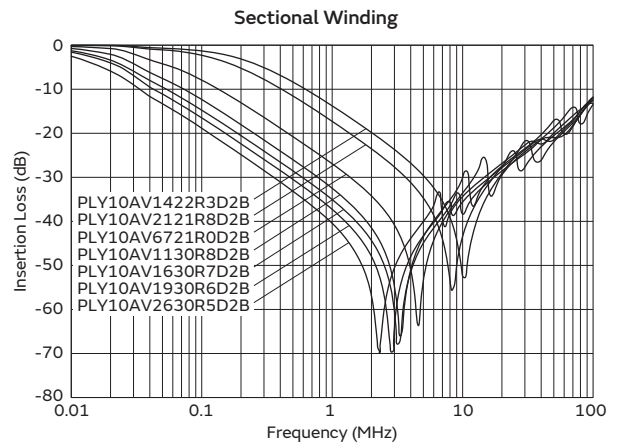
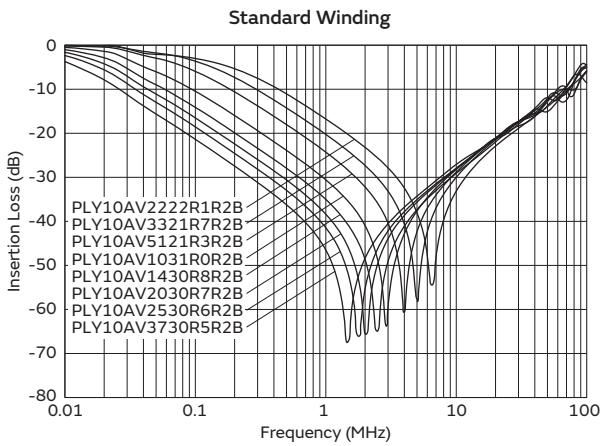


2

Common Mode Insertion Loss - Frequency Characteristics



Differential Mode Insertion Loss - Frequency Characteristics



PLY17 Series

Features

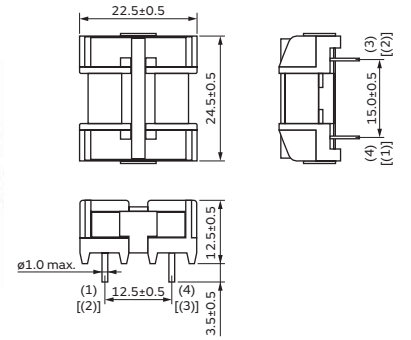
1. Integration of choke coil function to suppress differential mode/Low and High Frequency common mode noise.
2. Low Profile (H=<13mm)

Applications

1. For AC power supply, AC adapter
2. Low-profile equipment such as lighting equipment, FPD, Digital Amplifier



A/B Type



(in mm)

A Type

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|------------------------------------|------------------------------------|-------------------|---------------------|
| PLY17BN4912R4A2B | 0.49 | 18 | 2.4 | 300 |
| PLY17BN9612R0A2B | 0.96 | 36 | 2.0 | 300 |
| PLY17BN1023R0A2B | 1.0 | 36 | 3.0 | 300 |
| PLY17BN1121R8A2B | 1.1 | 44 | 1.8 | 300 |
| PLY17BN1721R5A2B | 1.7 | 67 | 1.5 | 300 |
| PLY17BN2921R2A2B | 2.9 | 110 | 1.2 | 300 |
| PLY17BN3721R0A2B | 3.7 | 140 | 1.0 | 300 |
| PLY17BN5620R8A2B | 5.6 | 210 | 0.8 | 300 |
| PLY17BN7820R7A2B | 7.8 | 290 | 0.7 | 300 |
| PLY17BN9320R6A2B | 9.3 | 350 | 0.6 | 300 |

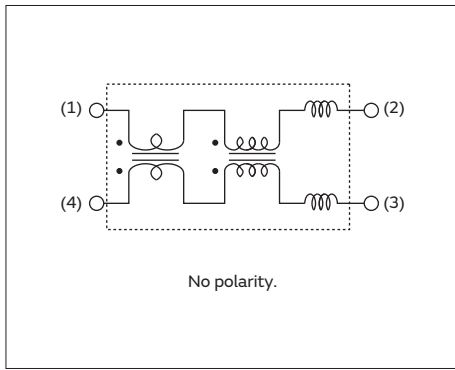
Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

B Type

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|------------------------------------|------------------------------------|-------------------|---------------------|
| PLY17BN4912R4B2B | 0.49 | 24 | 2.4 | 300 |
| PLY17BN9612R0B2B | 0.96 | 47 | 2.0 | 300 |
| PLY17BN1023R0B2B | 1.0 | 47 | 3.0 | 300 |
| PLY17BN1121R8B2B | 1.1 | 58 | 1.8 | 300 |
| PLY17BN1721R5B2B | 1.7 | 88 | 1.5 | 300 |
| PLY17BN2921R2B2B | 2.9 | 140 | 1.2 | 300 |
| PLY17BN3721R0B2B | 3.7 | 180 | 1.0 | 300 |
| PLY17BN5620R8B2B | 5.6 | 280 | 0.8 | 300 |
| PLY17BN7820R7B2B | 7.8 | 390 | 0.7 | 300 |
| PLY17BN9320R6B2B | 9.3 | 460 | 0.6 | 300 |

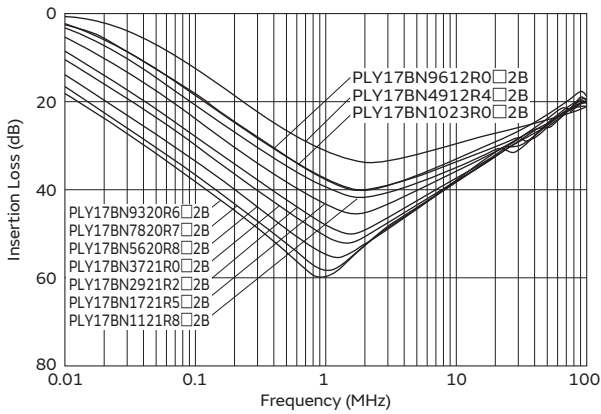
Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram

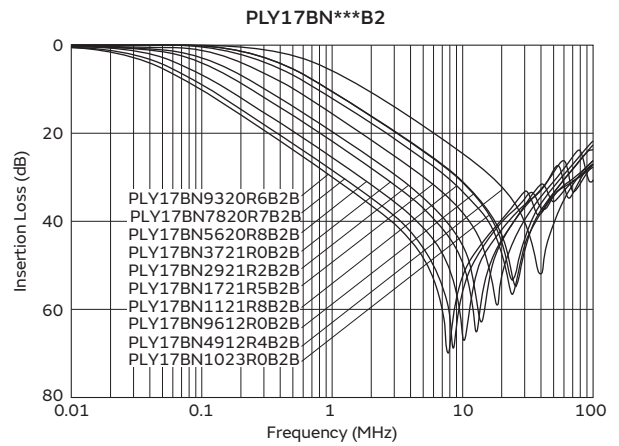
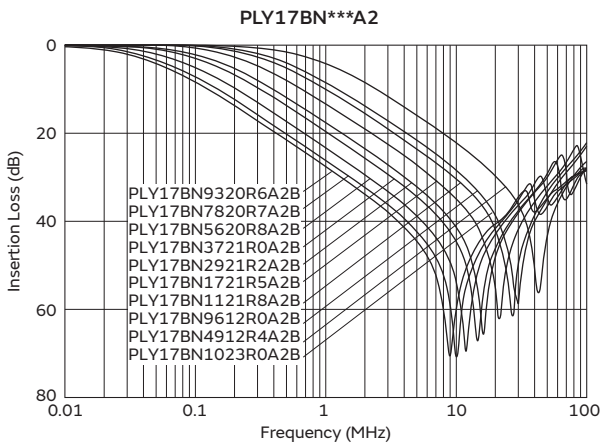


2

Common Mode Insertion Loss - Frequency Characteristics



Differential Mode Insertion Loss - Frequency Characteristics



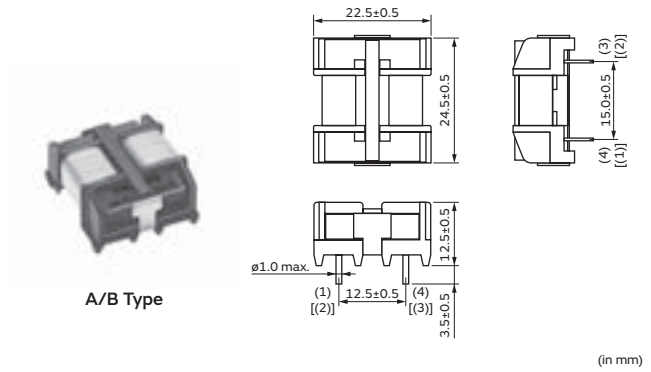
PLY17 Series (Safety Standard Recognized)

Features

1. Integration of choke coil function to suppress differential mode/Low and High Frequency common mode noise.
2. Low Profile (H=<13mm)
3. Safety standards: EN60065

Applications

1. For AC power supply, AC adapter
2. Low-profile equipment such as lighting equipment, FPD, Digital Amplifier



A Type

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|--|--|----------------------|------------------------|
| PLY17BS4912R4A2B | 0.49 | 18 | 2.4 | 250 |
| PLY17BS9612R0A2B | 0.96 | 36 | 2.0 | 250 |
| PLY17BS1023R0A2B | 1.0 | 36 | 3.0 | 250 |
| PLY17BS1121R8A2B | 1.1 | 44 | 1.8 | 250 |
| PLY17BS1721R5A2B | 1.7 | 67 | 1.5 | 250 |
| PLY17BS2921R2A2B | 2.9 | 110 | 1.2 | 250 |
| PLY17BS3721R0A2B | 3.7 | 140 | 1.0 | 250 |
| PLY17BS5620R8A2B | 5.6 | 210 | 0.8 | 250 |
| PLY17BS7820R7A2B | 7.8 | 290 | 0.7 | 250 |
| PLY17BS9320R6A2B | 9.3 | 350 | 0.6 | 250 |

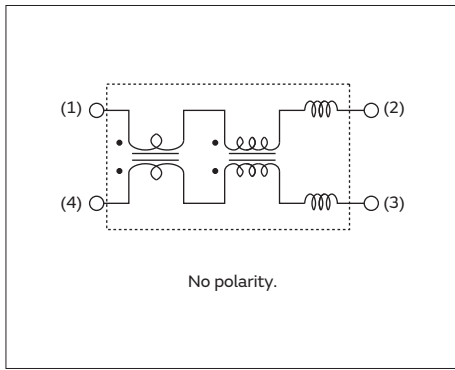
Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

B Type

| Part Number | Common Mode Inductance (min.) (mH) | Normal Mode Inductance (min.) (μH) | Rated Current (A) | Rated Voltage (VAC) |
|------------------|--|--|----------------------|------------------------|
| PLY17BS4912R4B2B | 0.49 | 24 | 2.4 | 250 |
| PLY17BS9612R0B2B | 0.96 | 47 | 2.0 | 250 |
| PLY17BS1023R0B2B | 1.0 | 47 | 3.0 | 250 |
| PLY17BS1121R8B2B | 1.1 | 58 | 1.8 | 250 |
| PLY17BS1721R5B2B | 1.7 | 88 | 1.5 | 250 |
| PLY17BS2921R2B2B | 2.9 | 140 | 1.2 | 250 |
| PLY17BS3721R0B2B | 3.7 | 180 | 1.0 | 250 |
| PLY17BS5620R8B2B | 5.6 | 280 | 0.8 | 250 |
| PLY17BS7820R7B2B | 7.8 | 390 | 0.7 | 250 |
| PLY17BS9320R6B2B | 9.3 | 460 | 0.6 | 250 |

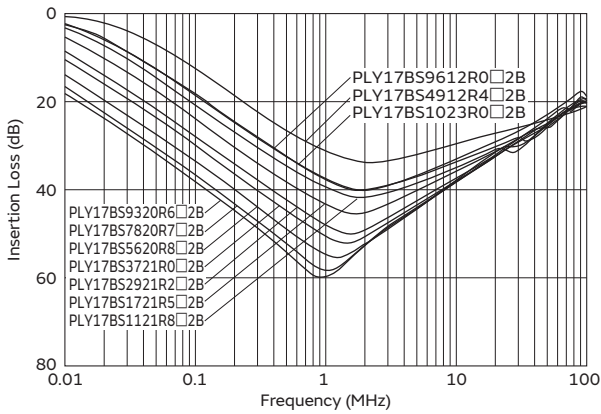
Operating Temperature Range: -25°C to 60°C Winding Temperature Rise (at Rated Current): 60°C (max.)

Equivalent Circuit Diagram

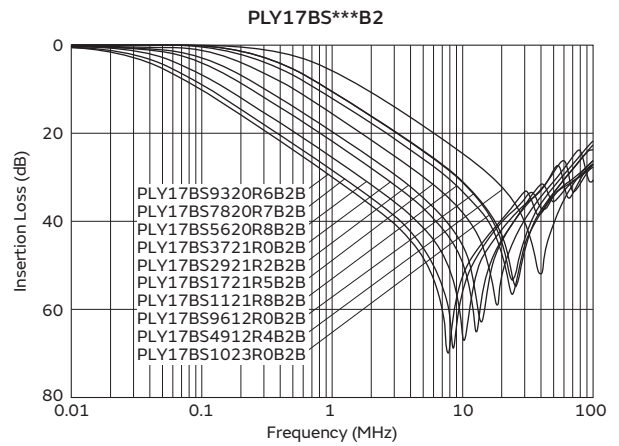
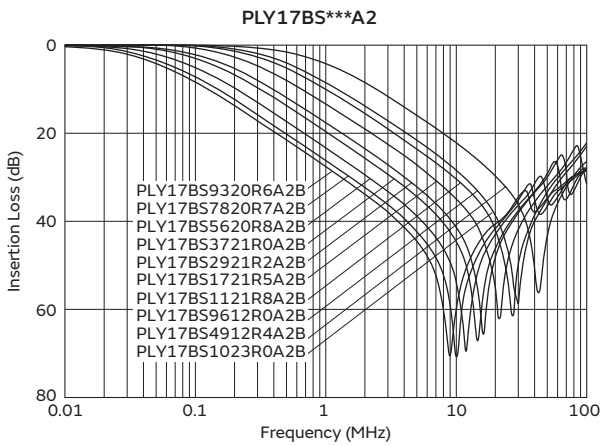


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Common Mode Insertion Loss - Frequency Characteristics

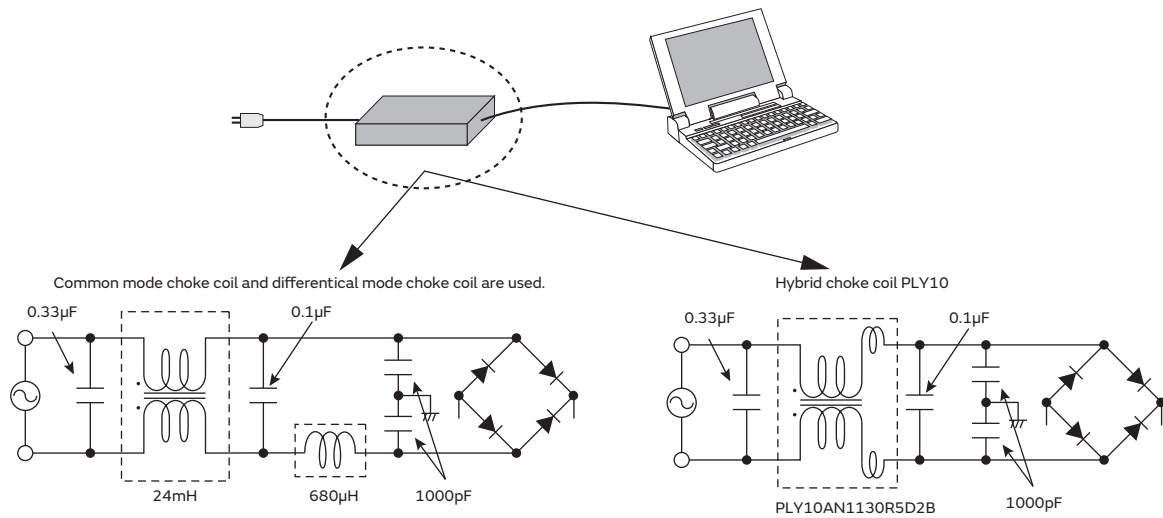


Differential Mode Insertion Loss - Frequency Characteristics



Noise Suppression Effect of PLY10 Series

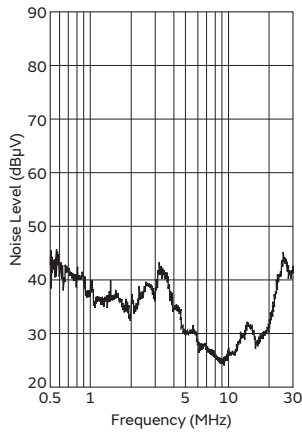
The data shows noise suppression effects comparison PLY10 with existing common mode choke coil. (In AC adaptor of notebook PC)



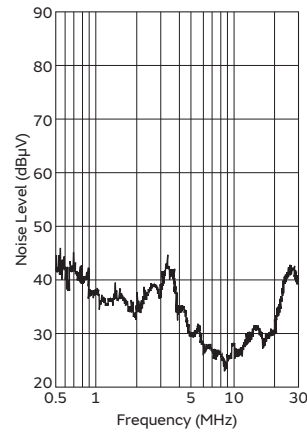
• Noise Level

The filter circuit with hybrid choke coil has suppressed conducted noise as well as a conventional filter in spite of its compact composition.

Common mode choke coil and differential mode choke coil are used.



Hybrid choke coil PLY10



⚠Caution/Notice

⚠Caution (Rating)

1. Rated Current

Operating current should not exceed the rated value. Even if operating current is under the rated value, adequate ventilation is required to avoid excessive heat generated within the product (choke coil) and from surrounding heat sources. If exceeding these conditions, excessive heat may cause fumes or permanent damage to the product. Please ensure that the product (choke coil) is evaluated and confirmed against the specification when it is mounted in your final assembled product.
 -> Winding temperature should be less than 120°C. Maximum allowable temperature at the surface of the coil (ambient temperature + winding temperature rise) is in accordance with each safety standard applicable to the final assembled product.

When the temperature at winding exceeds the maximum allowable temperature of the safety standard, the rated current should be derated.

2. Inrush Current

Inrush current should not exceed 10 times the rated current within 1/4 cycle of 50/60Hz commercial power line. Inrush current should be limited to a minimum of 10 seconds after last inrush.

If these conditions are exceeded, excessive heat may cause fumes or permanent damage to the component, or at worst cause ignition.

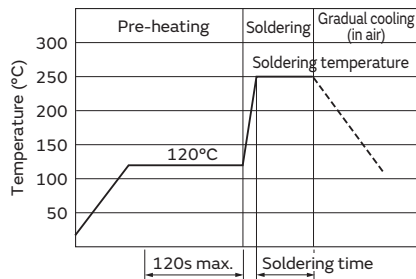
Notice (Storage and Operating Conditions)

1. Soldering Conditions

(1) Flux, Solder

- Rosin-based flux should be used. Do not use strong acidic flux with halide content exceeding 0.2wt% (chlorine conversion value)
- Use Sn-3.0Ag-0.5Cu solder

(2) Flow soldering profile



| Standard profile | | Limit profile | | |
|-----------------------|----------------|-----------------|----------------|---------------|
| Sn-3.0Ag-0.5Cu solder | | | | |
| Soldering temp. | Soldering time | Soldering temp. | Soldering time | Cycle of flow |
| 250±2°C | 4-6s | 265±3°C | 5s | 2 times |

For additional mounting methods, please contact Murata.

Notice (Soldering and Mounting)

Magnetic Flux Leakage

Choke coils generate small amounts of magnetic flux leakage that may adversely affect equipment operation according to component arrangement. Testing should be completed on final assembly to ensure equipment performance is not affected.

2. Cleaning

Avoid cleaning the product due to non-waterproof construction.

3. Storage and Handling Requirements

(1) Storage period

Product should be used within 12 months after receiving. Solderability should be checked if this period is exceeded.

(2) Storage conditions

Storage Temperature: -10 to 40 °C
 Relative humidity: 30 to 70%
 Avoid sudden changes in temperature and humidity. Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, as it may cause oxidation of lead terminals resulting in poor solderability or corrosion of component windings.

(3) Handling conditions

Care should be taken when transporting or handling the product to avoid excessive vibration or mechanical shock.

Notice (Rating)

Coil Humming Noise

Magnetic flux generated between coil and core or between the choke coil windings creates repulsive power between the coil windings. This repulsive power causes the coil winding to vibrate and create a humming noise. The amount of hum produced by the coil is proportionate to the amount of harmonic distortion generated by the operating current. This does not influence the electrical performance of the coils, but it should be considered and tested in actual circuit application.

Packaging

Minimum Quantity

| Part Number | Minimum Quantity (pcs.) |
|-------------|-------------------------|
| | Box |
| PLA10 | 1260 |
| PLH10 | 1260 |
| PLY10 | 1200 |
| PLY17 | 1080 |

Global Locations

For details please visit www.murata.com



⚠ Note

1 Export Control

For customers outside Japan:

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5 This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

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7 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.



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