

## Data Sheet

**Customer:**

**Product:** Multilayer Chip Common Mode Filter – CMX Series

**Sizes.:** 0504 / 0805 / 1206

**Issued Date:** 03-Jan-18

**Edition:** REV.A



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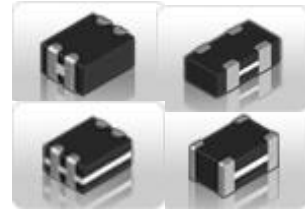
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|---------------------|------------------|---------------------|------------------------|---------------------------|
| 03-Jan-18           | 03-Jan-18        | 03-Jan-18           | 03-Jan-18              |                           |
| <i>Kris Chen</i>    | <i>Ben Chang</i> | <i>Ben Chang</i>    |                        |                           |

## Multilayer Chip Common Mode Filter

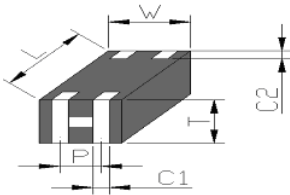
### ■ Features And Application

- Powerful components with composite co-fired material to solve EMI problem for high speed differential signal transmission line as USB, and LVDS, without distortion to high speed signal transmission.
- MIPI, MHL or HDMI, etc., serial interface in mobile device

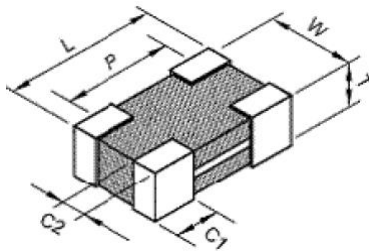


### ■ Dimensions

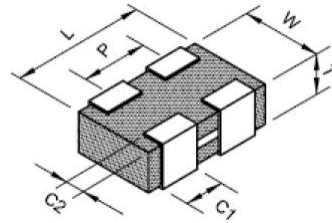
CMX04B



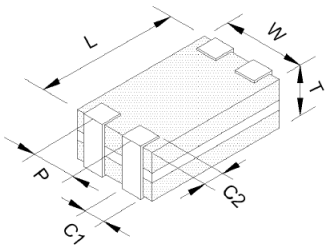
CMX05B



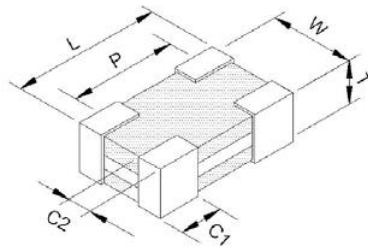
CMX06B



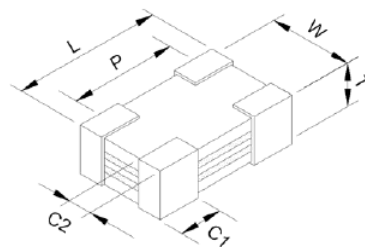
CMX04G



CMX05G



CMX05GYT500F



| Type   | Sizes (Inch) | L (mm)    | W (mm)    | T (mm)    | P (mm)    | C1 (mm)   | C2 (mm)   |
|--------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
| CMX04B | 0504         | 1.25±0.10 | 1.00±0.10 | 0.60±0.10 | 0.50±0.10 | 0.30±0.10 | 0.20±0.15 |
| CMX05B | 0805         | 2.00±0.20 | 1.25±0.20 | 1.00±0.10 | 1.60±0.20 | 0.40±0.20 | 0.30±0.20 |
| CMX06B | 1206         | 3.20±0.20 | 1.60±0.20 | 1.00±0.10 | 2.10±0.20 | 0.70±0.20 | 0.30±0.20 |
| CMX04G | 0504         | 1.25±0.10 | 1.00±0.10 | 0.50±0.10 | 0.55±0.10 | 0.30±0.10 | 0.20±0.15 |
| CMX05G | 0805         | 2.00±0.20 | 1.20±0.20 | 1.00±0.10 | 1.60±0.20 | 0.40±0.20 | 0.30±0.20 |

### ■ Part Numbering

| CMX          | 05B                                                           | Y                   | T              | 900                               |                                                                                            |
|--------------|---------------------------------------------------------------|---------------------|----------------|-----------------------------------|--------------------------------------------------------------------------------------------|
| Product Type | Dimensions LxW                                                | Impedance Tolerance | Packaging Code | Impedance                         | Function Code                                                                              |
|              | 04B: 0504<br>05B: 0805<br>06B: 1206<br>04G: 0504<br>05G: 0805 | Y: ±25%             | T: Taping Reel | 360: 36Ω<br>900: 90Ω<br>121: 120Ω | : General<br>H: High Speed<br>F: High Cut-off Frequency<br>U: Ultra High Cut-off Frequency |

**Multilayer Chip Common Mode Filter**

**■ Standard Electrical Specifications**

CMX04B Multilayer Chip Common Mode Filter / General Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Withstanding Voltage (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|--------------------------|---------------------------------|
| 36            | ±25%      | 100                  | 0.50         | 300                     | 10                    | 25                       | 200                             |
| 67            | ±25%      | 100                  | 0.50         | 300                     | 10                    | 25                       | 200                             |
| 90            | ±25%      | 100                  | 0.60         | 300                     | 10                    | 25                       | 200                             |
| 120           | ±25%      | 100                  | 0.60         | 300                     | 10                    | 25                       | 200                             |

CMX05B Multilayer Chip Common Mode Filter / General Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Withstanding Voltage (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|--------------------------|---------------------------------|
| 67            | ±25%      | 100                  | 0.40         | 400                     | 10                    | 25                       | 200                             |
| 90            | ±25%      | 100                  | 0.40         | 400                     | 10                    | 25                       | 200                             |
| 120           | ±25%      | 100                  | 0.40         | 400                     | 10                    | 25                       | 200                             |
| 160           | ±25%      | 100                  | 0.50         | 400                     | 10                    | 25                       | 200                             |
| 180           | ±25%      | 100                  | 0.50         | 400                     | 10                    | 25                       | 200                             |
| 220           | ±25%      | 100                  | 0.50         | 300                     | 10                    | 25                       | 200                             |

CMX06B Multilayer Chip Common Mode Filter / General Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Withstanding Voltage (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|--------------------------|---------------------------------|
| 90            | ±25%      | 100                  | 0.50         | 500                     | 10                    | 25                       | 200                             |
| 120           | ±25%      | 100                  | 0.50         | 500                     | 10                    | 25                       | 200                             |

CMX04G Multilayer Chip Common Mode Filter / High Speed Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|---------------------------------|
| 90            | ±25%      | 100                  | 1.0          | 100                     | 10                    | 100                             |

CMX05G Multilayer Chip Common Mode Filter / High Speed Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|---------------------------------|
| 67            | ±25%      | 100                  | 1.0          | 100                     | 10                    | 100                             |
| 90            | ±25%      | 100                  | 1.0          | 100                     | 10                    | 100                             |

CMX04G Multilayer Chip Common Mode Filter / High Cut-off Frequency Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|---------------------------------|
| 50            | ±25%      | 100                  | 1.5          | 100                     | 10                    | 100                             |
| 67            | ±25%      | 100                  | 1.5          | 100                     | 10                    | 100                             |
| 90            | ±25%      | 100                  | 1.5          | 100                     | 10                    | 100                             |

CMX05G Multilayer Chip Common Mode Filter / High Cut-off Frequency Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|---------------------------------|
| 50            | ±25%      | 100                  | 1.0          | 100                     | 10                    | 100                             |
| 90            | ±25%      | 100                  | 1.0          | 100                     | 10                    | 100                             |
| 120           | ±25%      | 100                  | 1.2          | 100                     | 10                    | 100                             |

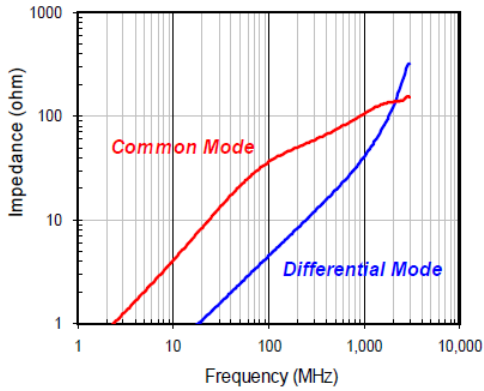
CMX04G Multilayer Chip Common Mode Filter / Ultra High Cut-off Frequency Use

| Impedance (Ω) | Tolerance | Test Condition (MHz) | DCR (Ω) max. | Rated Current (mA) max. | Rated Voltage Vdc (V) | Insulation Resistance (MΩ) min. |
|---------------|-----------|----------------------|--------------|-------------------------|-----------------------|---------------------------------|
| 15            | ±25%      | 100                  | 0.8          | 100                     | 10                    | 100                             |

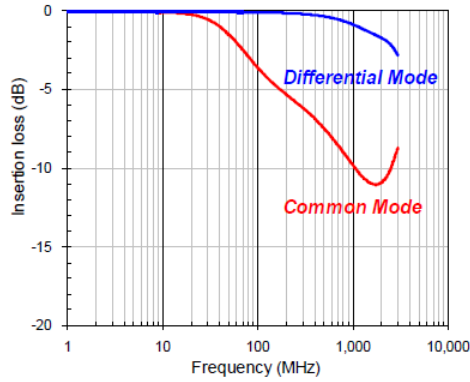
**Multilayer Chip Common Mode Filter**

**■ Characteristics**

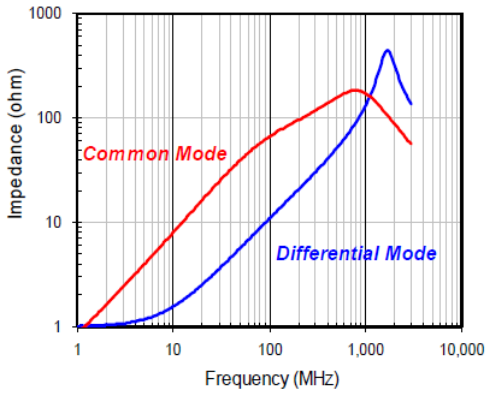
CMX04BYT360 Impedance vs. Frequency



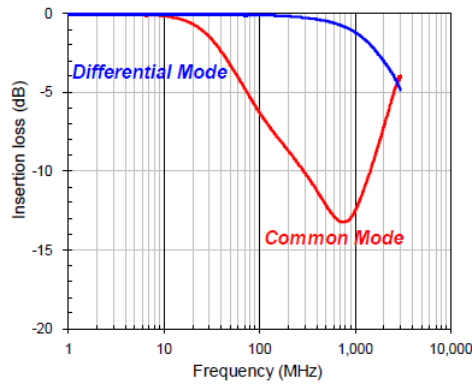
CMX04BYT360 Insertion Loss vs. Frequency



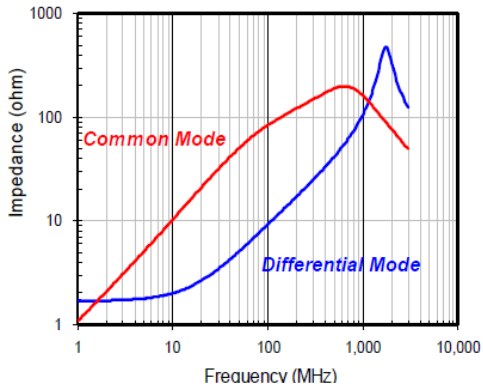
CMX04BYT670 Impedance vs. Frequency



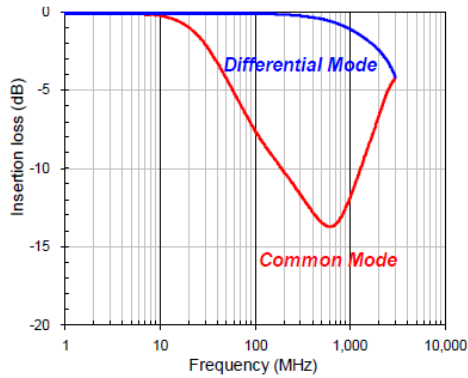
CMX04BYT670 Insertion Loss vs. Frequency



CMX04BYT900 Impedance vs. Frequency

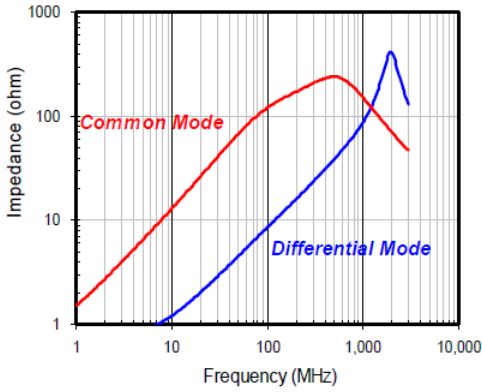


CMX04BYT900 Insertion Loss vs. Frequency

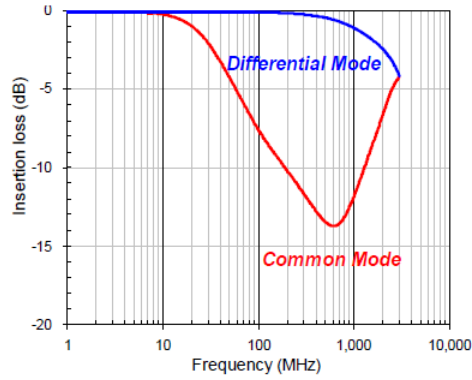


**■ Characteristics**

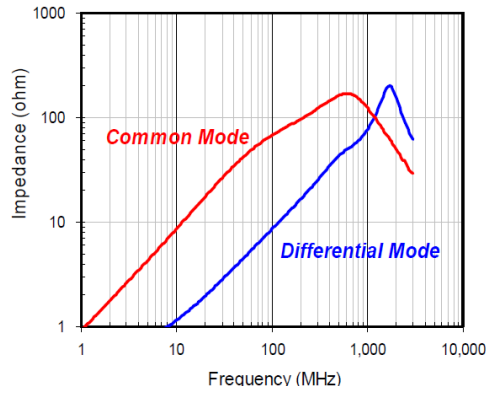
CMX04BYT121 Impedance vs. Frequency



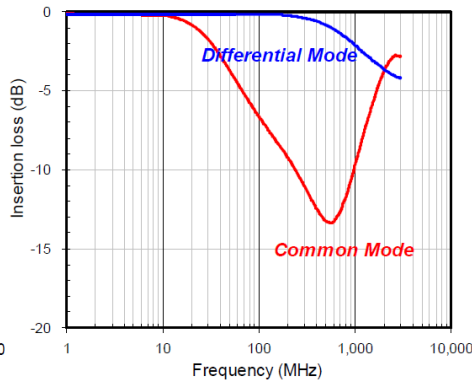
CMX04BYT121 Insertion Loss vs. Frequency



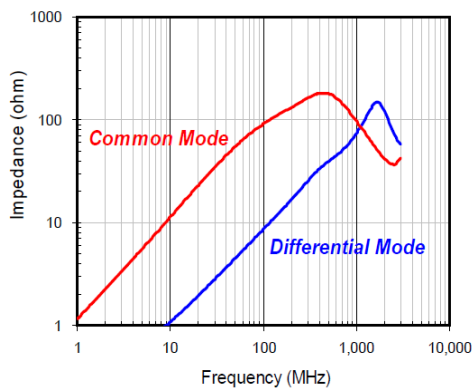
CMX05BYT670 Impedance vs. Frequency



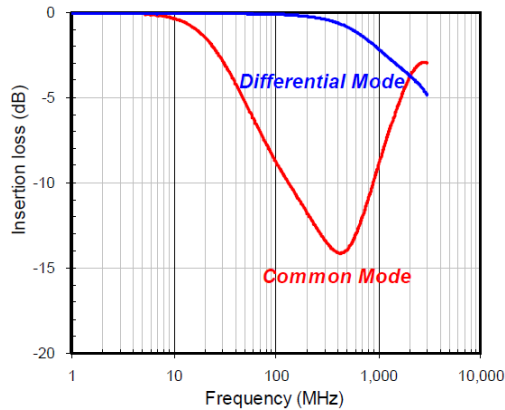
CMX05BYT670 Insertion Loss vs. Frequency



CMX05BYT900 Impedance vs. Frequency



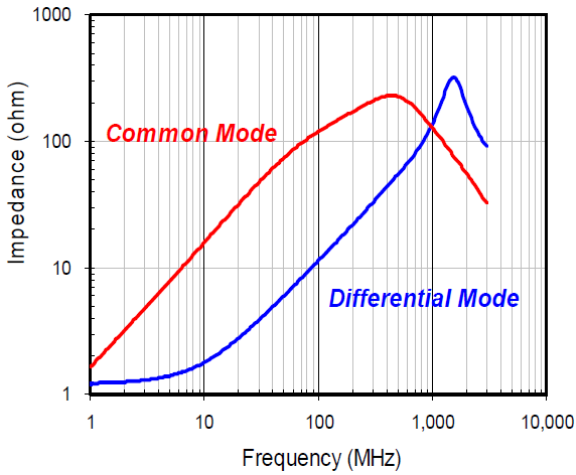
CMX05BYT900 Insertion Loss vs. Frequency



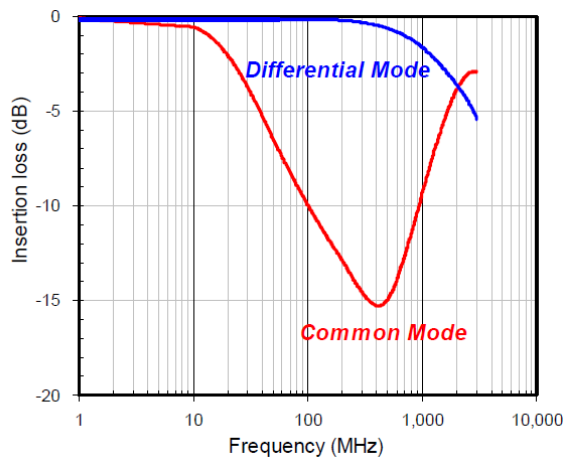
### Multilayer Chip Common Mode Filter

#### Characteristics

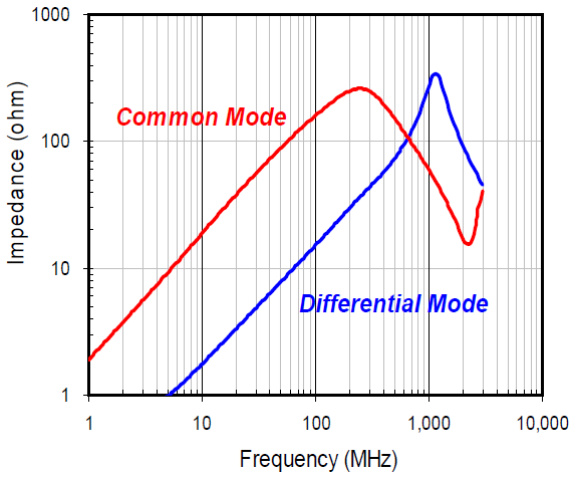
CMX05BYT121 Impedance vs. Frequency



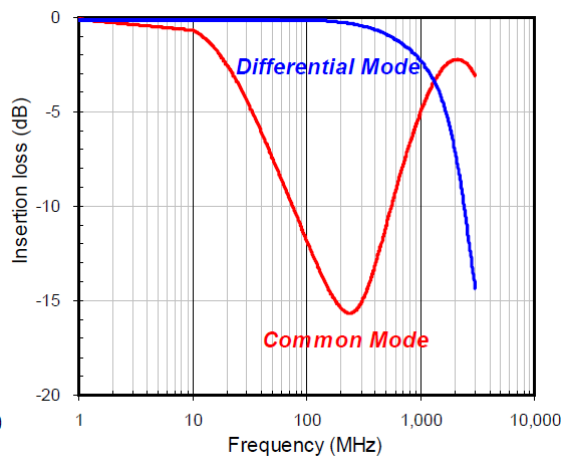
CMX05BYT121 Insertion Loss vs. Frequency



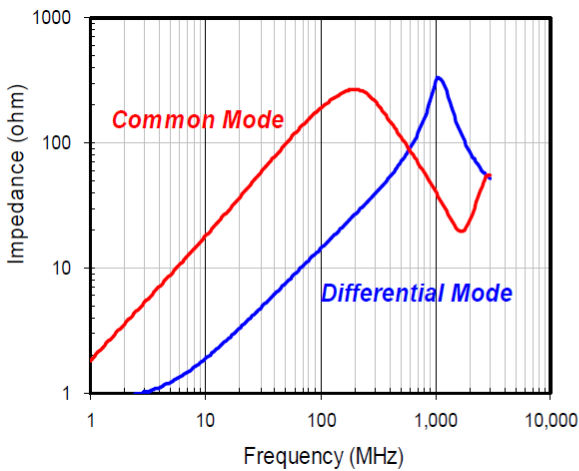
CMX05BYT161 Impedance vs. Frequency



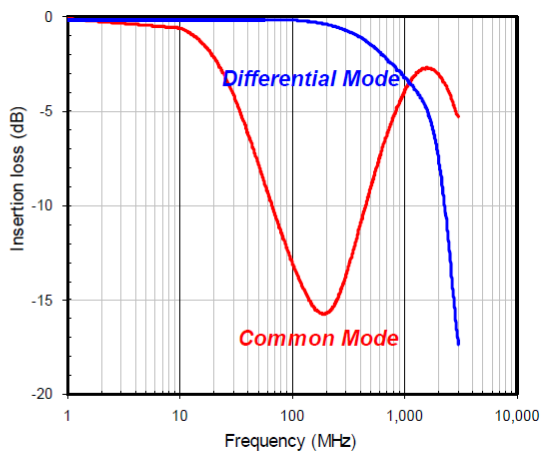
CMX05BYT161 Insertion Loss vs. Frequency



CMX05BYT181 Impedance vs. Frequency



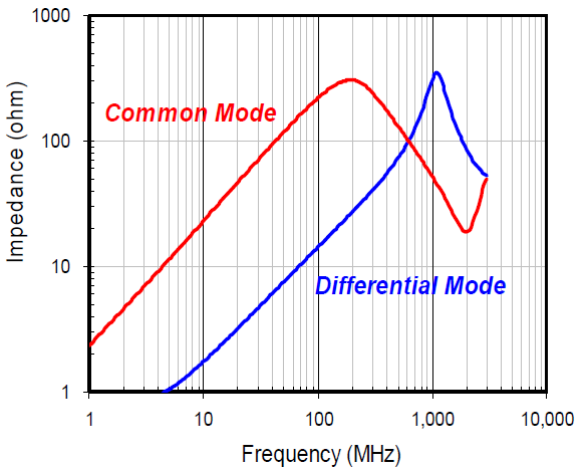
CMX05BYT181 Insertion Loss vs. Frequency



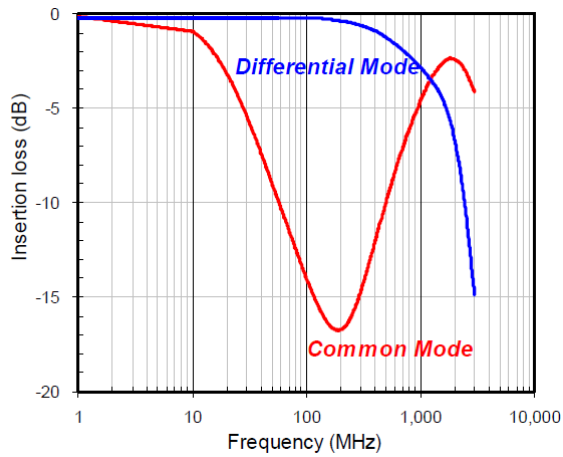
**Multilayer Chip Common Mode Filter**

**■ Characteristics**

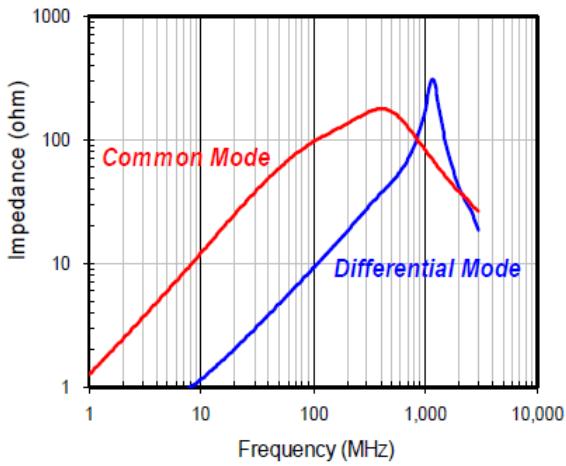
CMX05BYT181 Impedance vs. Frequency



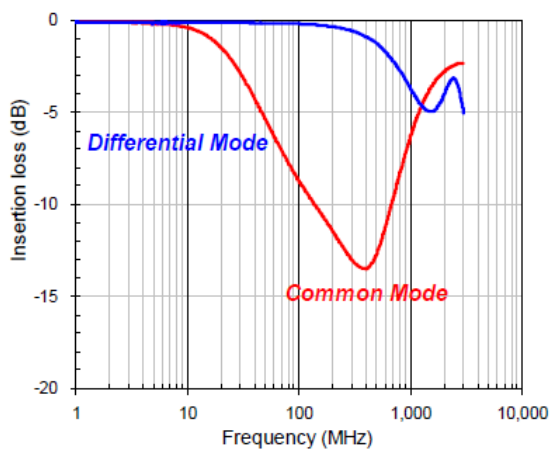
CMX05BYT181 Insertion Loss vs. Frequency



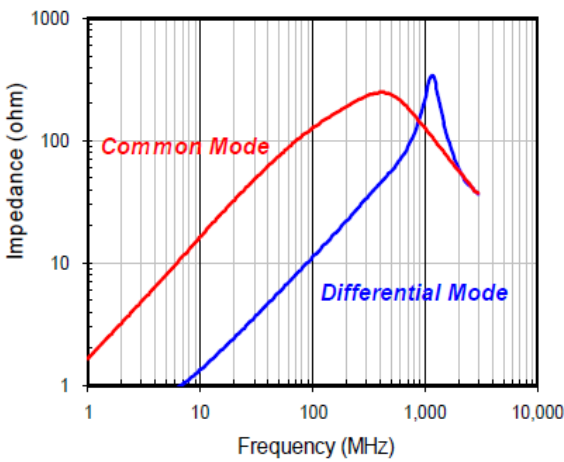
CMX06BYT900 Impedance vs. Frequency



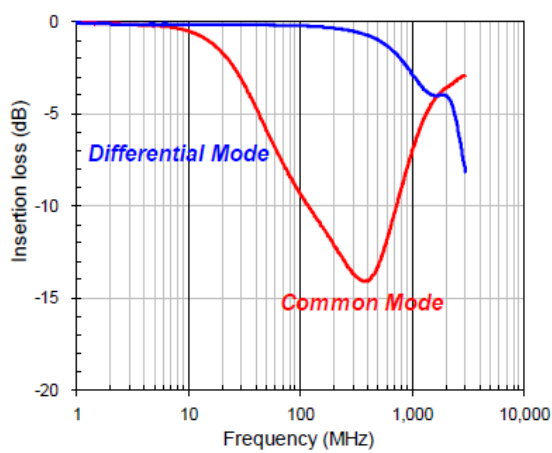
CMX06BYT900 Insertion Loss vs. Frequency



CMX06BYT121 Impedance vs. Frequency



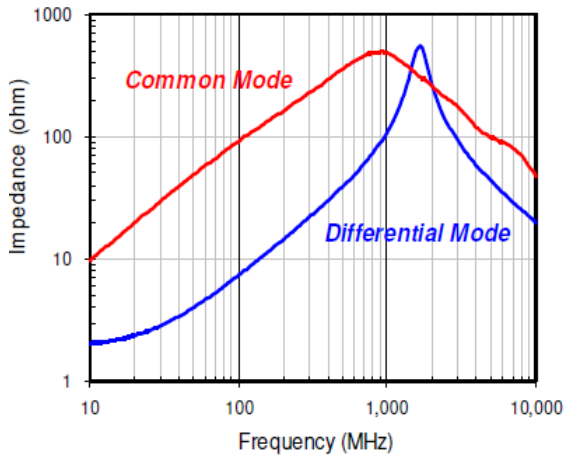
CMX06BYT121 Insertion Loss vs. Frequency



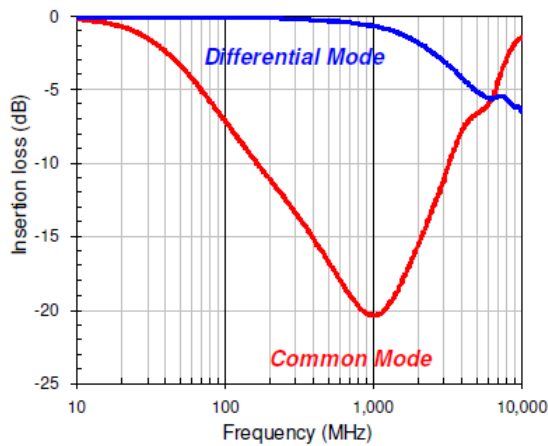
**Multilayer Chip Common Mode Filter**

**■ Characteristics**

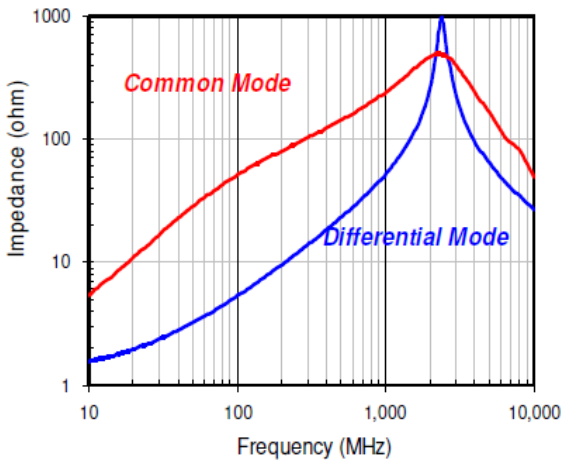
CMX04GYT900H Impedance vs. Frequency



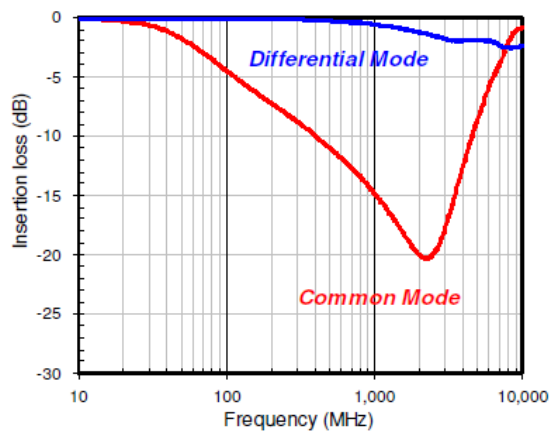
CMX04GYT900H Insertion Loss vs. Frequency



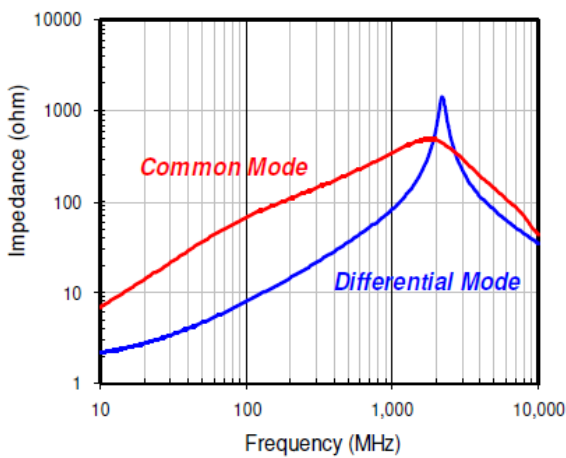
CMX04GYT500F Impedance vs. Frequency



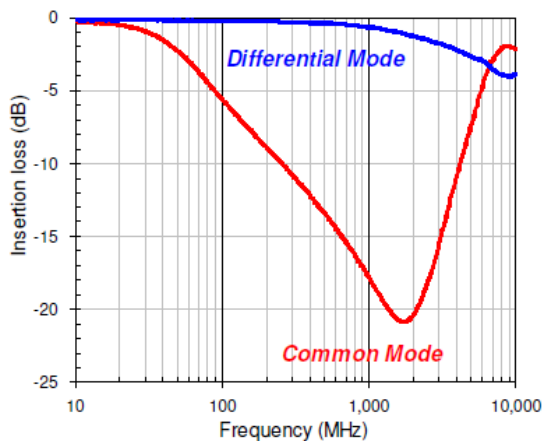
CMX04GYT500F Insertion Loss vs. Frequency



CMX04GYT670F Impedance vs. Frequency



CMX04GYT670F Insertion Loss vs. Frequency

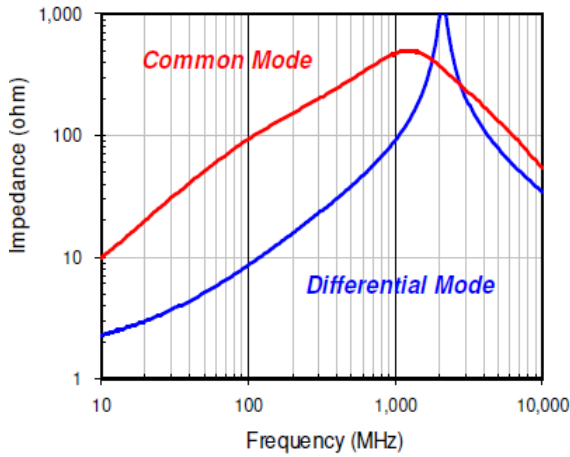




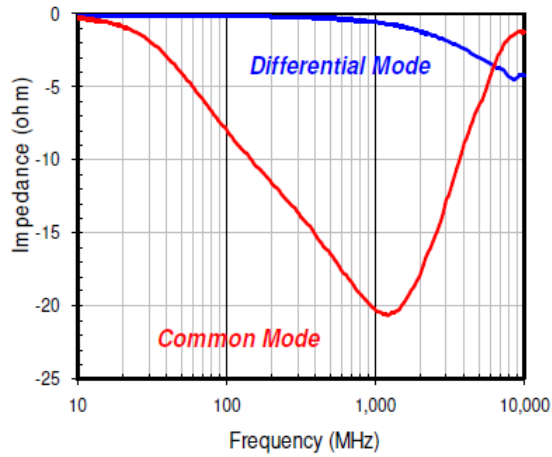
**Multilayer Chip Common Mode Filter**

**Characteristics**

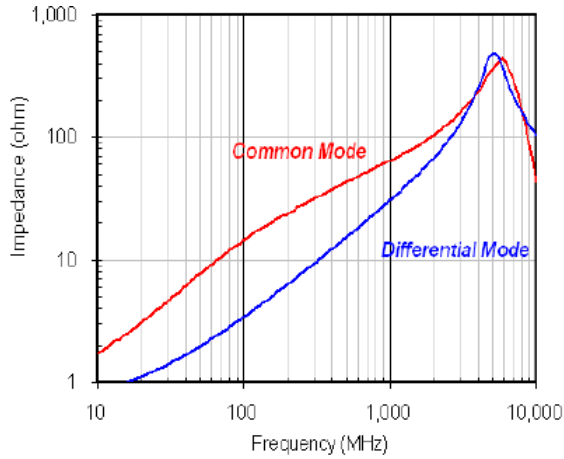
CMX04GYT900F Impedance vs. Frequency



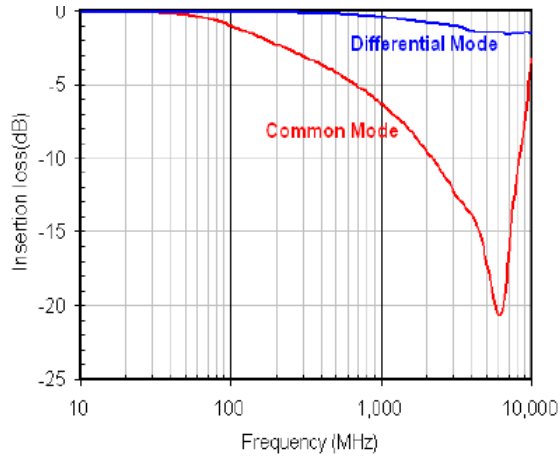
CMX04GYT900F Insertion Loss vs. Frequency



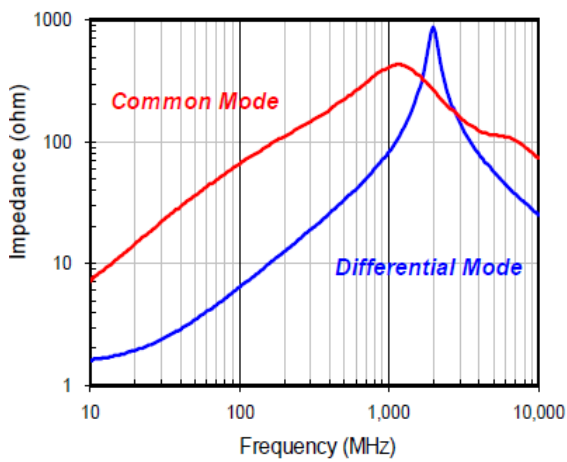
CMX04GYT150U Impedance vs. Frequency



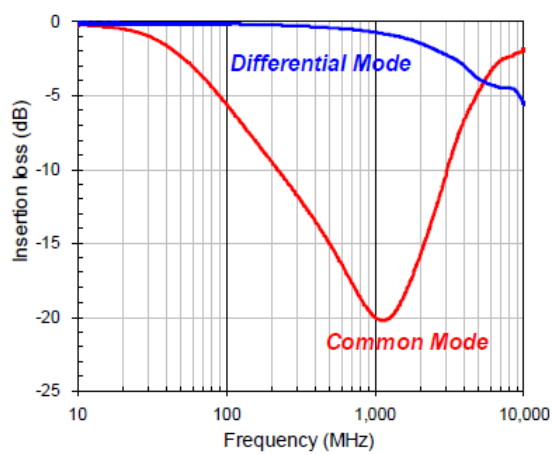
CMX04GYT150U Insertion Loss vs. Frequency



CMX05GYT670H Impedance vs. Frequency



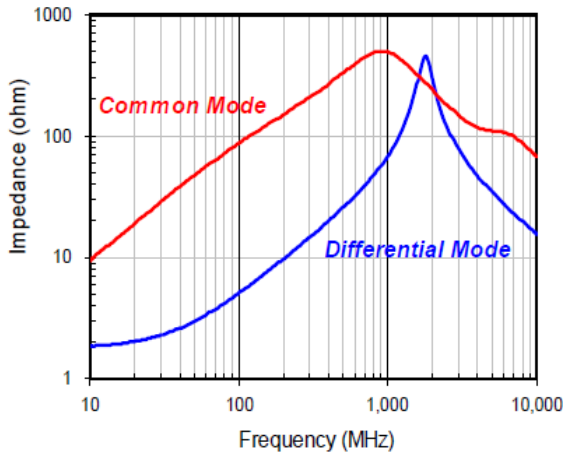
CMX05GYT670H Insertion Loss vs. Frequency



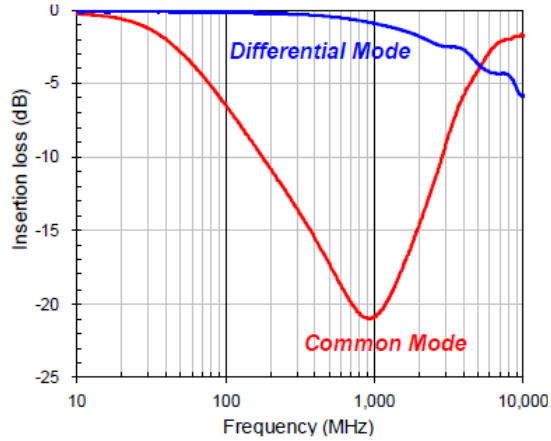
**Multilayer Chip Common Mode Filter**

**■ Characteristics**

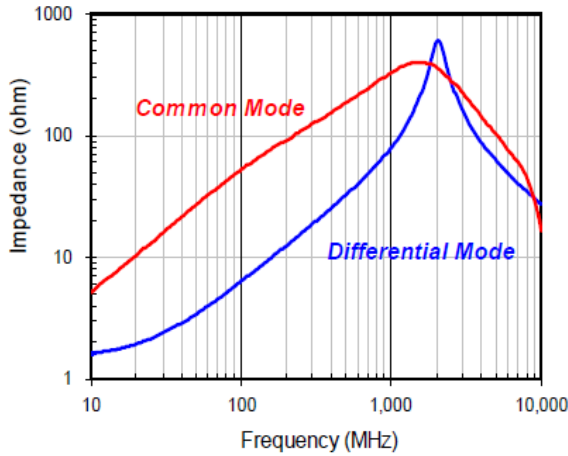
CMX05GYT900H Impedance vs. Frequency



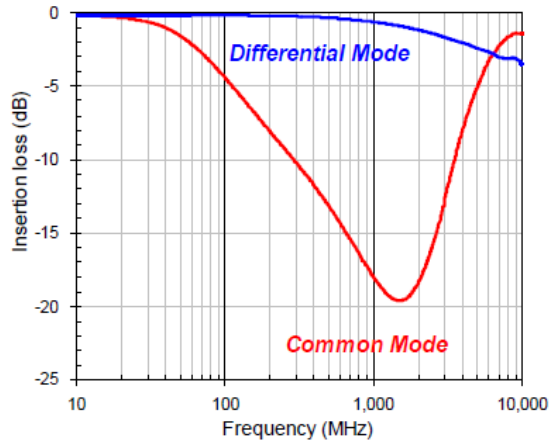
CMX05GYT900H Insertion Loss vs. Frequency



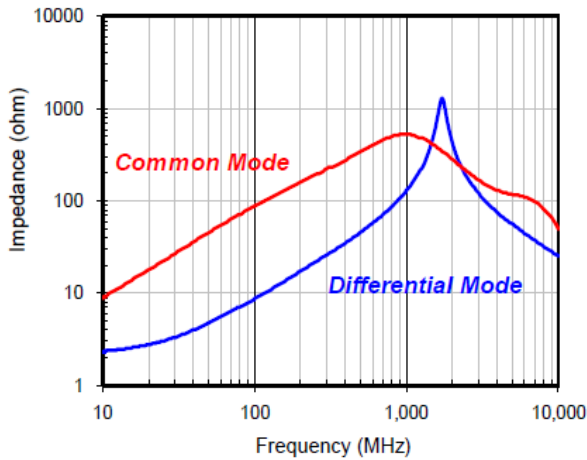
CMX05GYT500F Impedance vs. Frequency



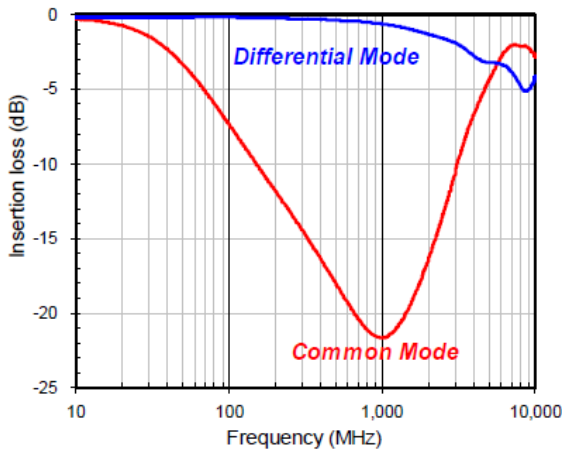
CMX05GYT500F Insertion Loss vs. Frequency



CMX05GYT900F Impedance vs. Frequency



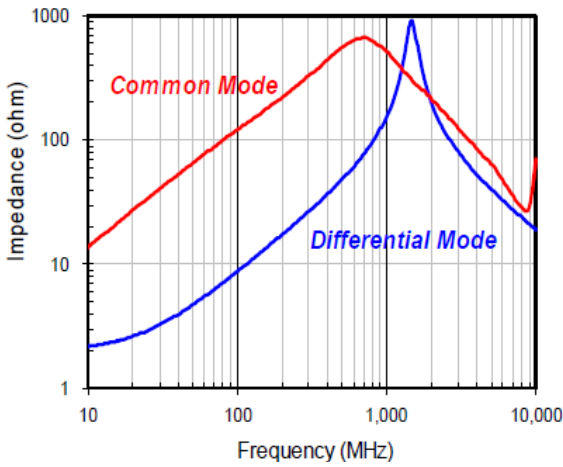
CMX05GYT900F Insertion Loss vs. Frequency



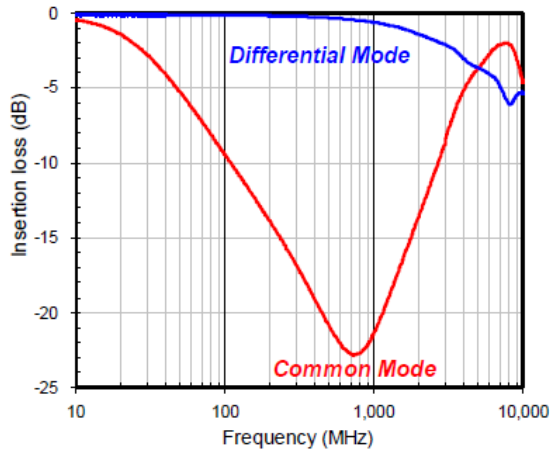
**Multilayer Chip Common Mode Filter**

**■ Characteristics**

CMX05GYT121F Impedance vs. Frequency



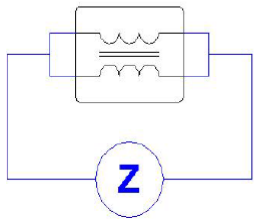
CMX05GYT121F Insertion Loss vs. Frequency



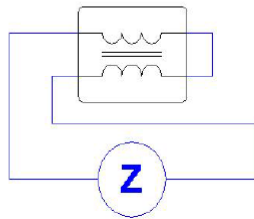
**■ Measuring Circuits**

CMX04B

(A): Common mode

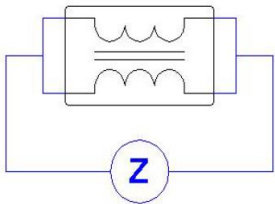


(B): Differential mode

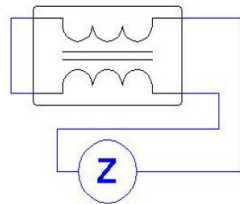


CMX05B / CMX05G

(A): Common mode

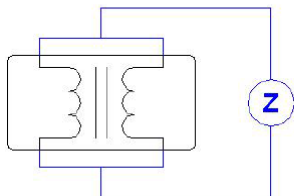


(B): Differential mode

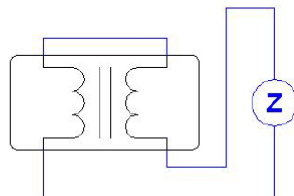


CMX06B

(A): Common mode

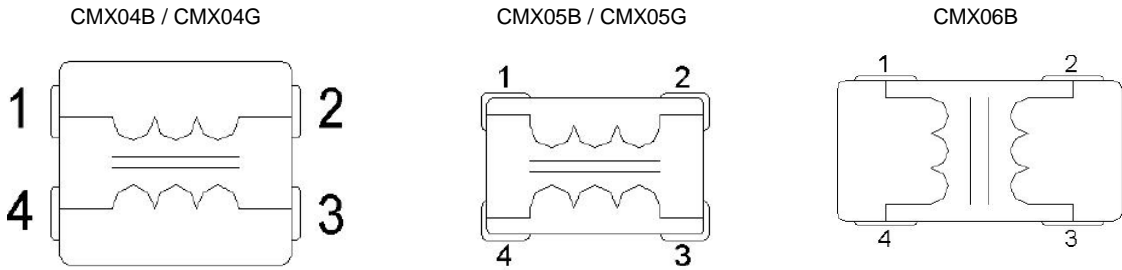


(B): Differential mode

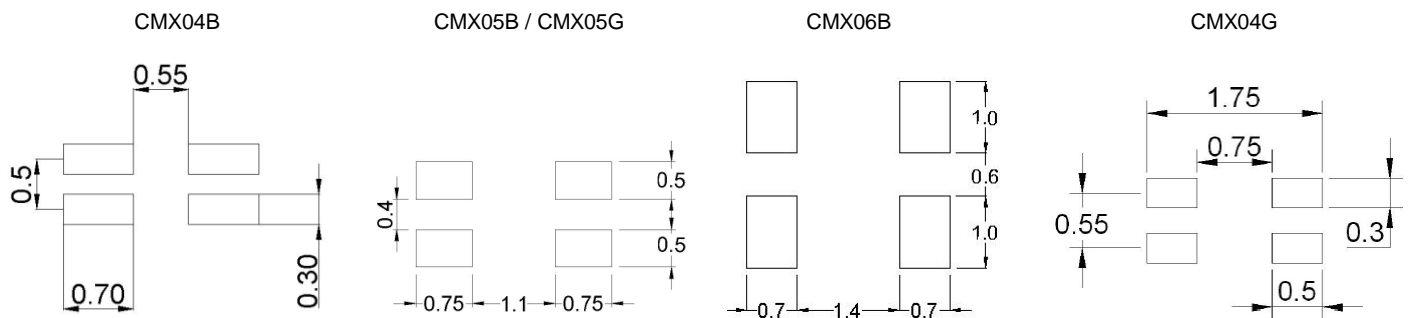


**Multilayer Chip Common Mode Filter**

**■ Circuits Configuration**



**■ Recommend Land Pattern** unit: mm



**■ Environmental Characteristics**

Electrical Performance Test

| Items     | Requirement                                       | Test Conditions                                 |
|-----------|---------------------------------------------------|-------------------------------------------------|
| Impedance | Refer to standard electrical characteristic spec. | Agilent E4991A RF Impedance / Material Analyzer |
| DCR       |                                                   | HP4338 Milliohmmer                              |

Mechanical Performance Test

| Items                     | Requirement                                                                       | Test Conditions                                                                                                                                                    |
|---------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Cycle         | No mechanical damage<br>Impedance value should be within±20% of the initial value | Temperature: -40~85℃<br>Cycle: 1000cycles<br>Dwell time: 30min<br>Measurement: at ambient temperature 24hrs after test completion                                  |
| Operational Life          |                                                                                   | Temperature: 85±5℃<br>Time: 1000hrs<br>Apply current: full rated current<br>Measurement: at ambient temperature 24hrs after test completion                        |
| Biased Humidity           |                                                                                   | Temperature: 40±5℃<br>Humidity: 90~95% RH<br>Time: 1000hrs<br>Apply current: full rated current<br>Measurement: at ambient temperature 24hrs after test completion |
| Resistance to Solder Heat |                                                                                   | Solder temperature: 260±5℃<br>Flux: rosin<br>Dip time: 10±1 sec                                                                                                    |
| Steam Aging Test          |                                                                                   | Temperature: 93±2℃<br>Test time: 8hrs (04B/05B/06B), 4hrs(04G/05G)<br>Solder temperature: 235±5℃<br>Flux: rosin<br>Dip time: 5±1 sec                               |

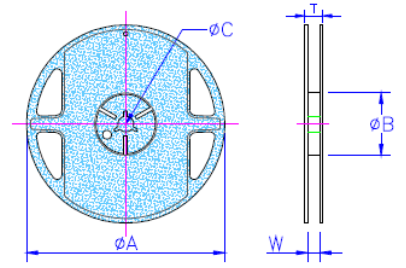
**■ Operating temperature range: -40~85℃**

**Multilayer Chip Common Mode Filter**

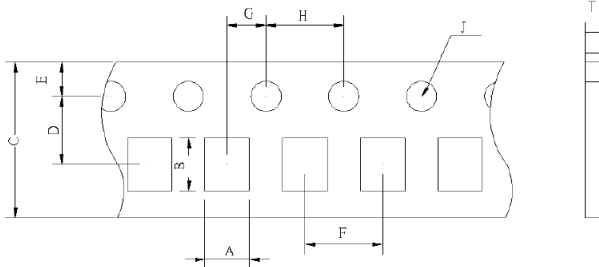
**■Packaging**

Packaging Quantity & Reel Specifications

| Type  | ∅A (mm) | ∅B (mm)   | ∅C (mm)  | W (mm)  | T (mm)    | Quantity (EA) |
|-------|---------|-----------|----------|---------|-----------|---------------|
| CMX04 | 178±1   | 60+0.5/-0 | 13.0±0.2 | 9.0±0.5 | 12.0±0.15 | 4000          |
| CMX05 | 178±1   | 60+0.5/-0 | 13.0±0.2 | 9.0±0.5 | 12.0±0.15 | 3000          |
| CMX06 | 178±1   | 60+0.5/-0 | 13.0±0.2 | 9.0±0.5 | 12.0±0.15 | 3000          |

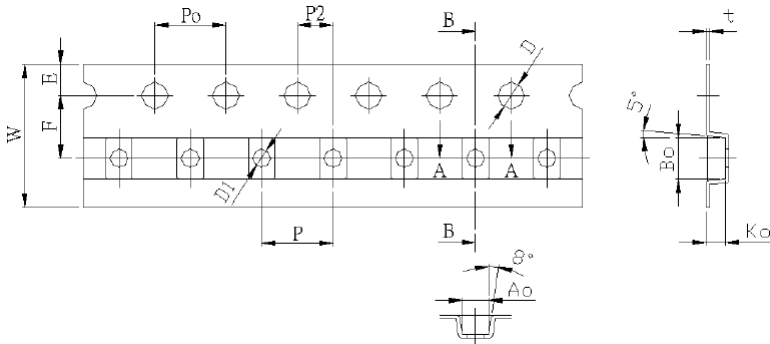


Paper Tape Specifications



| Type  | A (mm)    | B (mm)    | C (mm)   | D (mm)   | E (mm)    | F (mm)    | G (mm)    | H (mm)    | J (mm)    | T (mm)    |
|-------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CMX04 | 1.20±0.05 | 1.45±0.05 | 8.0±0.10 | 3.5±0.05 | 1.75±0.05 | 4.00±0.10 | 2.00±0.05 | 4.00±0.10 | 1.55±0.05 | 0.75±0.03 |

Emboss Plastic Tape Specifications



| Type  | A0 (mm)   | B0 (mm)   | W (mm)   | E (mm)    | F (mm)    | P (mm)    | P0 (mm)   | P2 (mm)   | D (mm)      | D1 (mm)   | K0 (mm)   | t (mm)    |
|-------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-------------|-----------|-----------|-----------|
| CMX05 | 1.40±0.10 | 2.30±0.10 | 8.0±0.10 | 1.75±0.10 | 3.50±0.05 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.5+0.10/-0 | 1.00±0.10 | 1.13±0.10 | 0.22±0.05 |
| CMX06 | 1.80±0.10 | 3.40±0.10 | 8.0±0.10 | 1.75±0.10 | 3.50±0.05 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.55±0.05   | 1.00±0.05 | 1.25±0.10 | 0.22±0.05 |

**■Recommended Soldering Conditions**

