

EMI Common Mode Choke

Automotive Grade

APPM Series



Overview

An EMI common mode choke (CMC) for power lines is a passive component specifically designed to suppress electromagnetic interference (EMI) in power supply circuits. A full series of common mode choke is designed for excellent noise attenuation with compact sizing for use in wide range of applications. Both standard series and custom designs are available.

Benefits

1. Automotive DC Power Line Common Mode Filter
2. Ferrite NiZn core offers high Z@High frequency
3. Ferrite Ni-Zn+MnZn core offers High Z @ Low frequency
4. Operating temperature range—40°C~125°C
5. Excellent solderability

Applications

1. Networking
2. EMI solutions for charger
3. Media player, Dashboard
4. Battery management
5. Lighting, MCU, Infotainment

Product Information

Series	Size Code (JIS/EIA)	Impedance(Ω)
APPM	5050/2020	70 ~ 4300
	7060/2824	
	9070/3628	
	1211/4844	
	1513/6052	
	4850/1920	

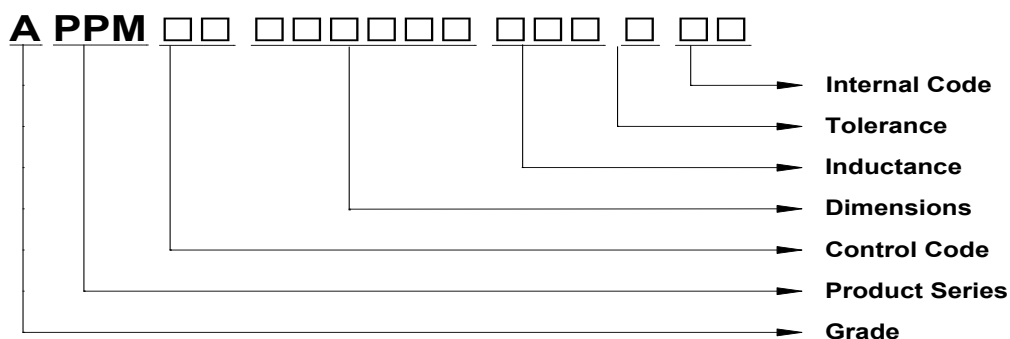


APPM00151365 Series Specification

AEC-Q200

1 Scope: This specification applies to the Pb Free DC Power Line Common Mode Filter

2 Part Numbering:



3 Rating:

Operating Temperature range: -55°C ~ +150°C (Including self temp. rise)

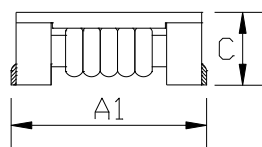
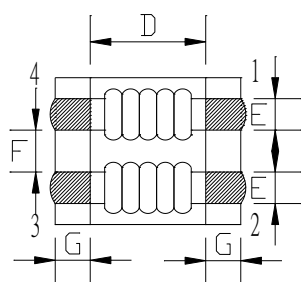
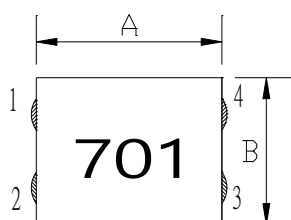
Storage Temperature range: -55°C ~ +150°C (For after the circuit board is mounted)

Storage Temperature: (on tape & reel): -20°C to +40°C; 75% RH max.

4 Standard Testing Condition:

	Unless otherwise specified	In case of doubt
Temperature	Ordinary Temperature(15 to 35°C)	20 to 30°C
Humidity	Ordinary Humidity(25 to 85% RH)	50 to 80 %RH

5 Configuration and Dimensions and Unit Weight:



A:	15.0±0.5	mm
A1:	15.5±0.5	mm
B:	13.0±0.5	mm
C:	6.5 Max.	mm
D:	9.0 Typ.	mm
E:	3.4 Typ.	mm
F:	2.8 Typ.	mm
G:	3.0 Typ.	mm

Net Weight (grms)

Marking : XXX

Marking color : Black

SIZE CODE	Net Weight (grms)
151365	3.34(Typ.)

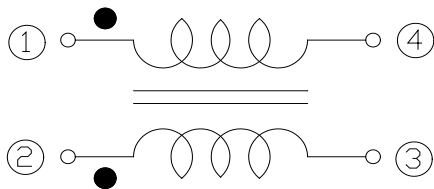
APPM00151365 Series Specification

AEC-Q200

6 Electrical Characteristics:

PT/NO.	Impedance(Ω) at 100MHz		Test Frequency	Resistance RDC(m Ω) Max.(1 line)	Rated Current (A) Max.	Insulation Resistance (M Ω) Min.	Rated Voltage (V)Max.	Marking
	Min.	Typ.						
APPM00151365301XY0	250	300	100MHz	4.7	13	10	125	301
APPM00151365551XY0	450	550	100MHz	3.8 $\pm$ 20%	10	10	125	551
APPM00151365701XY0	500	700	100MHz	7.0	10	10	125	701
APPM00151365102XY0	600	1000	100MHz	9.0	8.5	10	125	102
APPM00151365152XY0	1100	1500	50MHz	9.0	8.5	10	125	152
APPM00151365232XY0	1800	2300	50MHz	11.0	7.0	10	125	232
APPM00151365322XY0	2700	3200	40MHz	15.5	6.0	10	125	322
APPM00151365432XY0	3700	4300	30MHz	21.0	5.0	10	125	432

CIRCUIT DIAGRAM



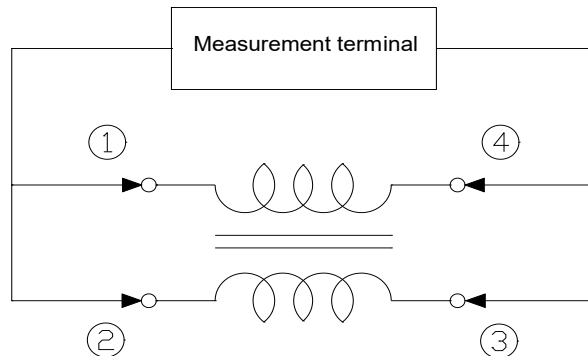
NOTE:

- 1.Rated DC Current : Based on temperature rise (ΔT : 40°C Typ.)
- 2.Hi-Pot(Pri-Sec) : 1200V DC/ 1mA/ 3 seconds

6 Electrical Characteristics:

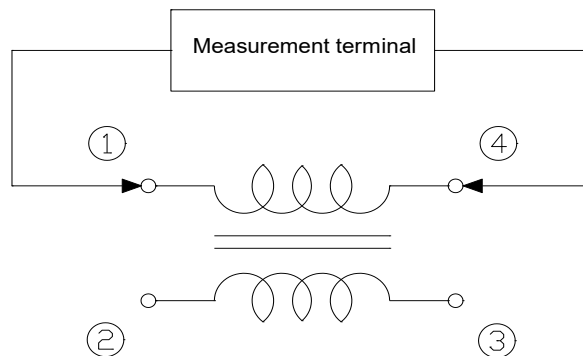
(6)-1 Impedance

Measured by HP4291B RF Impedance Analyzer.



(6)-2 DC Resistance

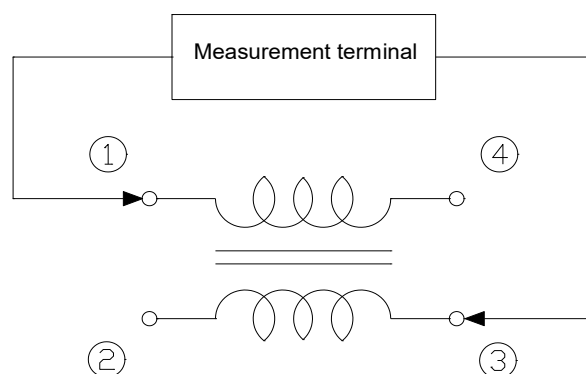
Measured by Chroma 16502 milliohm meter.



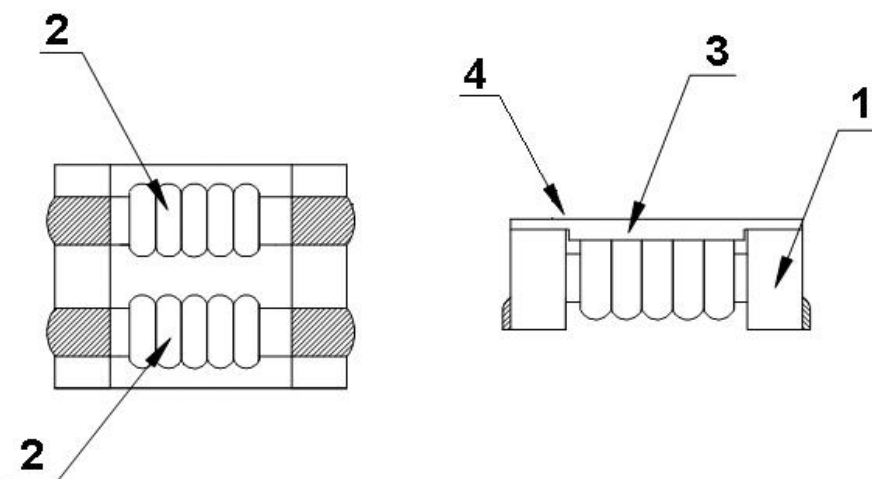
(6)-3 Insulation Resistance

Measured by Chroma 19073

Measurement voltage : 50V ,Measurement time : 3 sec.



6 6.1 Construction:



6.2 Material List:

NO.	ITEM	DESCRIPTION & TYPE
1	CORE	FERRITE
2	Wire	Magnet Wire
3	Cover	LCP
4	Marking	INK

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MECHANICAL

TEST ITEM	SPECIFICATIONS	TEST CONDITIONS
Solderability	No more than 5% of the solderable metalization exposed underlying, non-wettable base metal or metallization layers or portions of the ceramic substrate after exposure to molten solder.	Refer to J-STD-002 For both Leaded & SMD. Electrical Test not required. Test Method B @ 245±5°C, dwell for 5+0/-0.5 seconds
Resistance to Soldering heat (reflow soldering)	There shall be no damage or problems.	Temperature profile of reflow soldering Note: - Re-Flow Possible times: within 3 times - Nitrogen adopted is recommended while in re-flow
Terminal strength	The terminal electrode and the ferrite must not be damaged.	With the component mounted on a PCB obtained from the Supplier with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested.
Strength on PC board bending	The terminal electrode and the ferrite must not be damaged.	Test device shall be soldered on the substrate Substrate Dimension: 100x40x1.6mm Deflection: 2.0mm Keeping Time: 60 sec
High Temperature Exposure (Storage)	Impedance: Within ±20% of the initial value. Insulation resistance and DC resistance on the specification shall be met. The terminal electrode and the ferrite must not be damaged.	1000hrs. at rated operating temperature, part can be stored for 1000 hrs. @ 150°C. Unpowered. Measurement at 24±4 hours after test conclusion.

APPM00151365 Series Specification

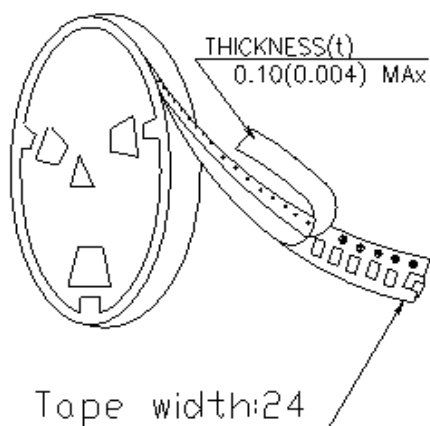
AEC-Q200

MECHANICAL

TEST ITEM	SPECIFICATIONS	TEST CONDITIONS
Humidity Bias	Impedance: Within $\pm 20\%$ of the initial value. Insulation resistance and DC resistance on the specification shall be met. The terminal electrode and the ferrite must not be damaged.	Precondition: Reflow peak temperature 260°C 3 times. (Reference: J-STD-020) 1000 hours 85°C/85%RH. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Vibration	Impedance: Within $\pm 20\%$ of the initial value. Insulation resistance and DC resistance on the specification shall be met. The terminal electrode and the ferrite must not be damaged.	MIL-STD-202 Method 204 5 g's for 20 minutes, 12 cycles each of 3 orientations. Test from 10-2000Hz.
Temperature Cycling	Impedance: Within $\pm 20\%$ of the initial value. Insulation resistance and DC resistance on the specification shall be met. The terminal electrode and the ferrite must not be damaged.	Precondition: Reflow peak temperature 260°C 3 times. (Reference: J-STD-020) 1000 cycles (-55°C to +150°C). Measurement at 24 $\pm$ 4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time.
High Temperature Operating Life	Impedance: Within $\pm 20\%$ of the initial value. Insulation resistance and DC resistance on the specification shall be met. The terminal electrode and the ferrite must not be damaged.	Precondition: Reflow peak temperature 260°C 3 times. (Reference: J-STD-020) 1000 hrs. @ 150 °C, apply maximum rated power. Measurement 24 $\pm$ 4 hours after test conclusion.
Physical Dimensions	Verify physical dimensions to the applicable component detail specification.	Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.
Mechanical Shock	1. Electrical characterization- Impedance: Within $\pm 20\%$ change range 2. Appearance-No damage (OM)	Units are non-operating. Pulse shape : Half-sine waveform Impact acceleration : 100 g's Pulse duration : 6 ms Number of shocks : 18 shocks (3 shocks for each face)
Flammability	The marking and A side have no obvious broken, and the marking are clearly	Refer to UL 94 Burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.

7 Packaging:

7.1 Packaging -Cover Tape

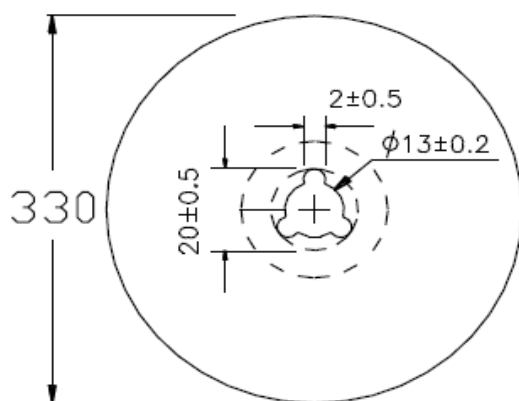


7.2 Packaging Quantity

TYPE	PCS/REEL
APPM00151365	450

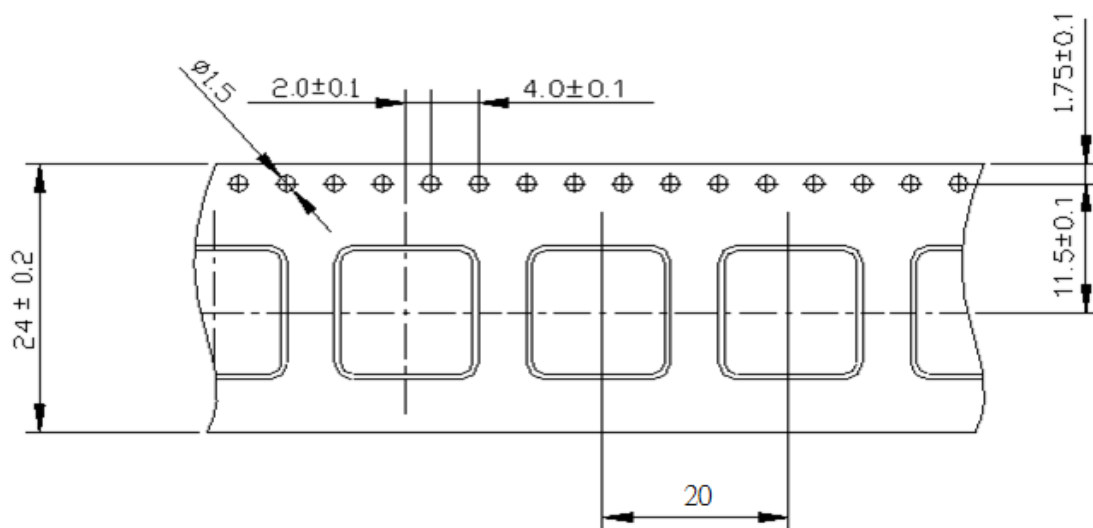
7.3 Reel Dimensions

Unit : mm

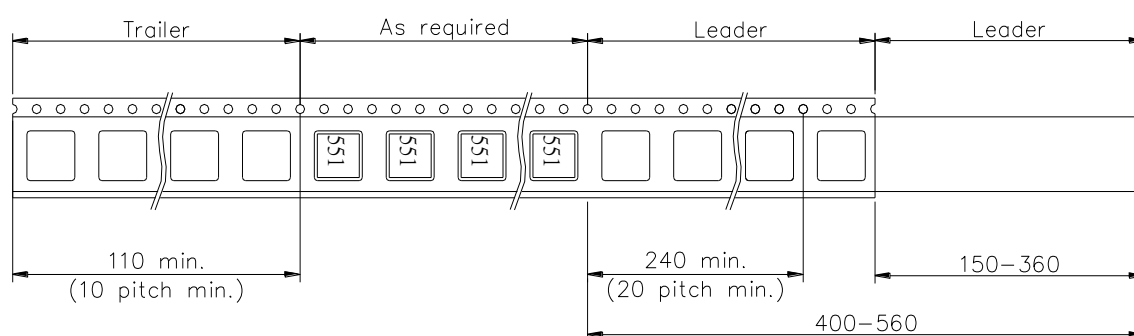
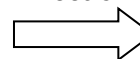


7 Packaging:

7.4 Tape Dimensions in mm

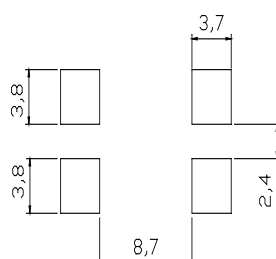


Unreeling
Direction



8 Recommended Land Pattern:

(STANDARD PATTERN) Unit : mm



9 Note:

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Do not knock or drop.
3. All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
4. Please keep the distance between transformer/coil and other components (refer to the standard IEC 950)
5. The moisture sensitivity level (MSL) of products is classified as level 1.
6. Suggestion

On customer side this product series need to be fixed by the glue after IR reflow.

Please refer to below example photo:



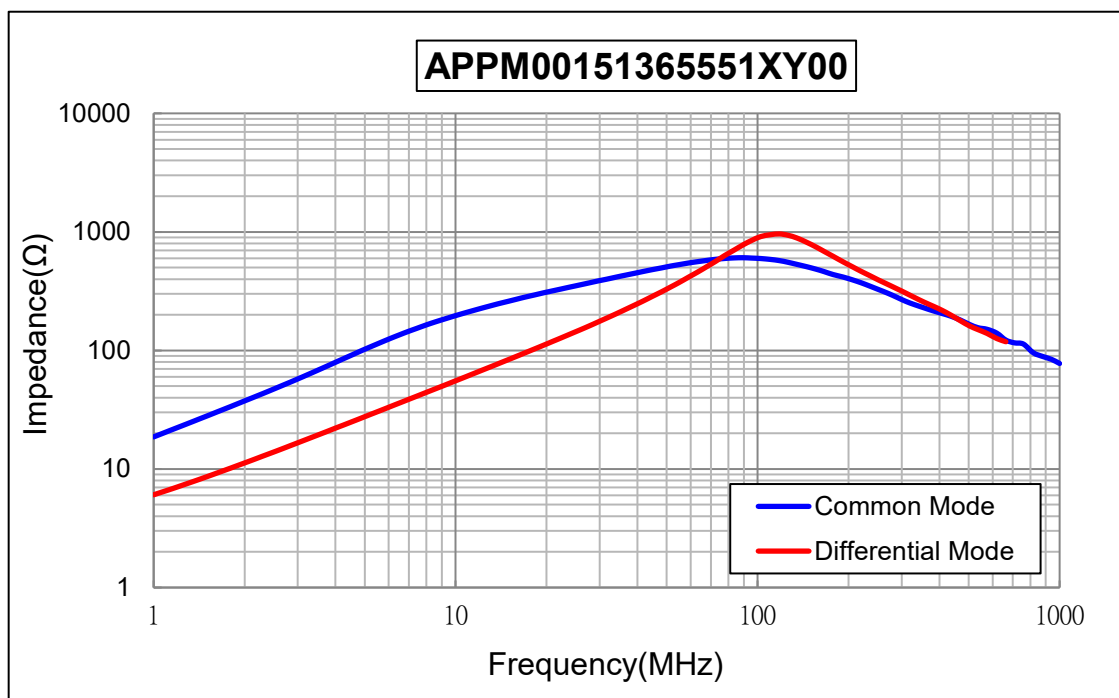
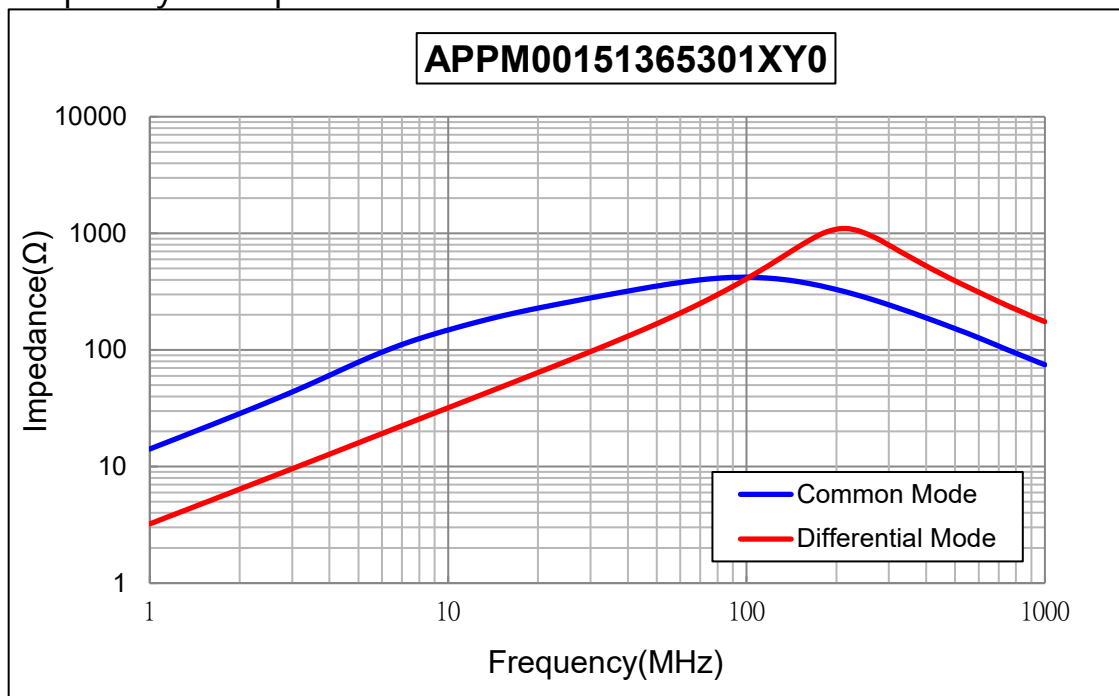
Glue

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TYPICAL ELECTRICAL CHARACTERISTICS

Frequency vs impedance

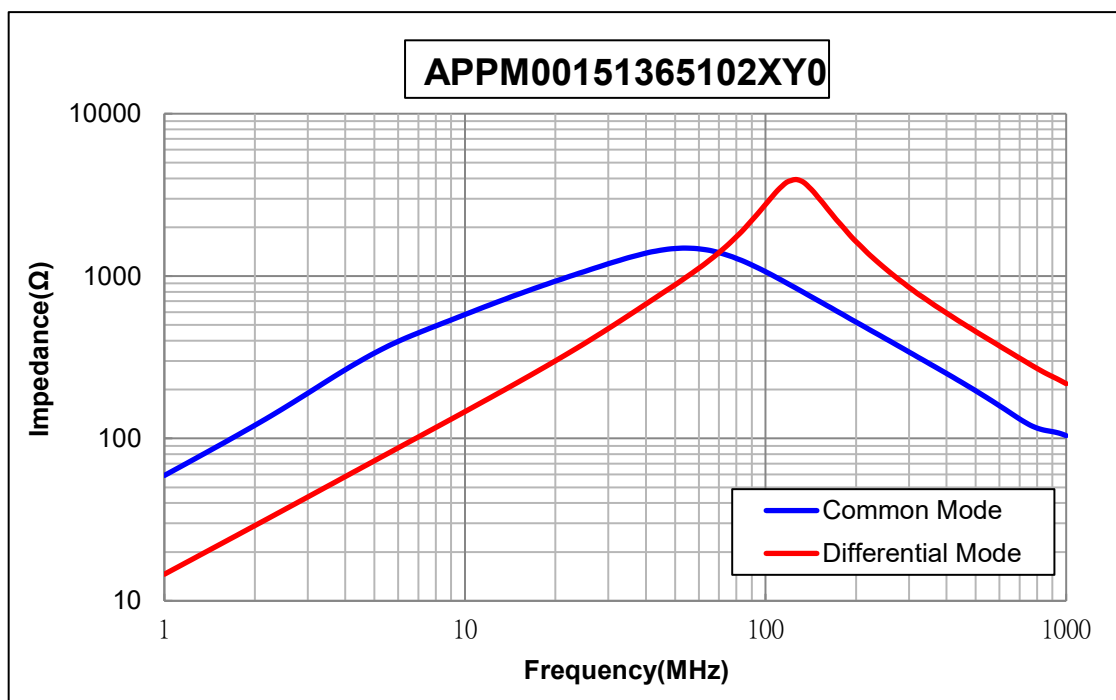
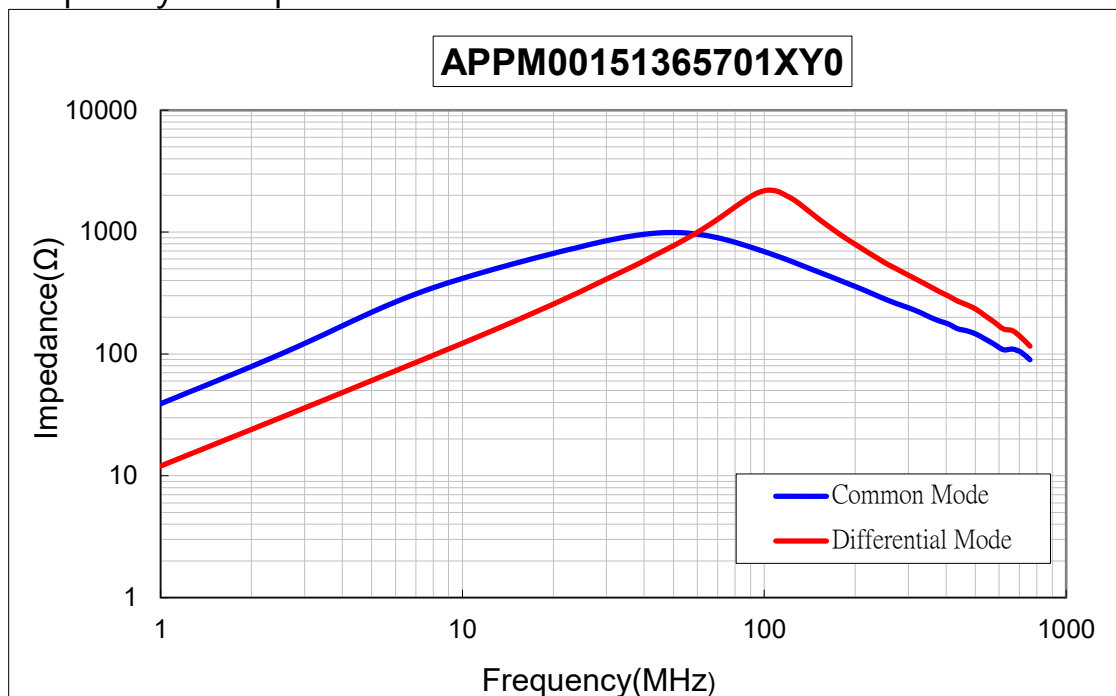


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Frequency vs impedance

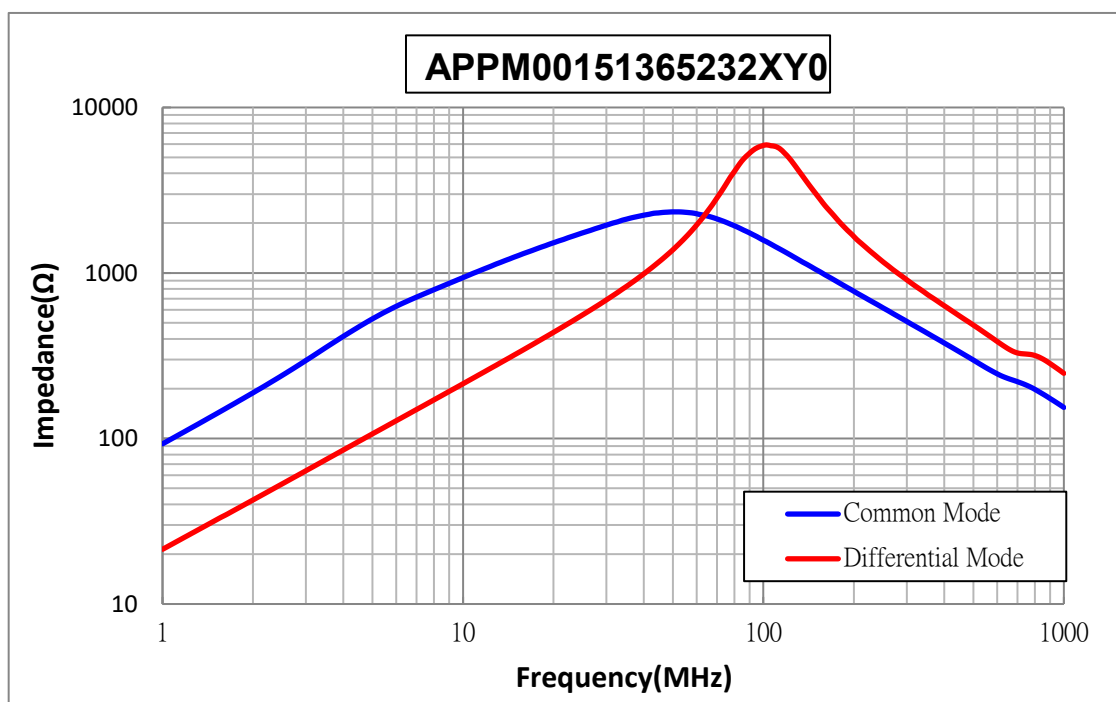
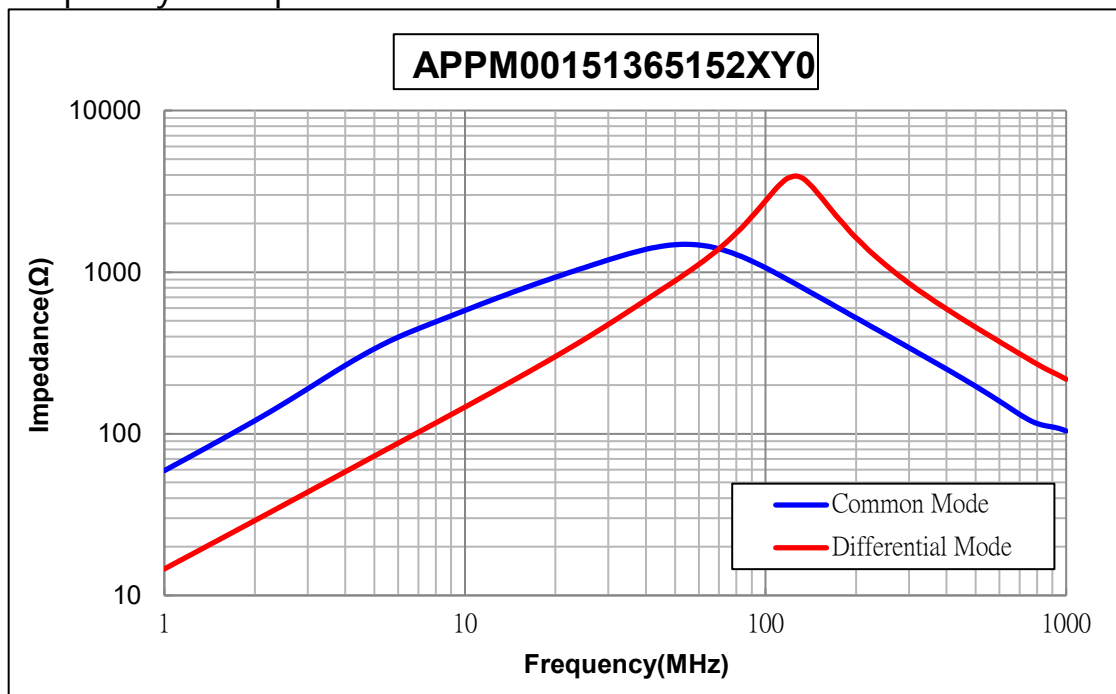


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