

# Common mode Noise Filters with ESD Suppressor

Type: EXC24CS



## Features

- Provides EMI Filtering and ESD Protection (L 1.25 mm×W 1.00 mm×H 0.50 mm)
- ESD and noise suppression of high-speed differential transmission lines with little influence of waveform rounding on signal transmission
- High Common mode attenuation in the range between 700 MHz and 1000 MHz (RF band)
- Strong multilayer/sintered structure, excellent reflow resistance and high mounting reliability
- Lead, halogen and antimony-free
- RoHS compliant

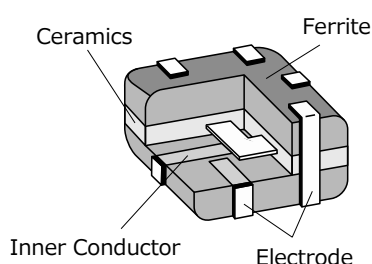
## Recommended Applications

- Smartphones, Tablet PCs and DSC
- ESD and noise suppression of high-speed differential data lines such as MIPI and USB

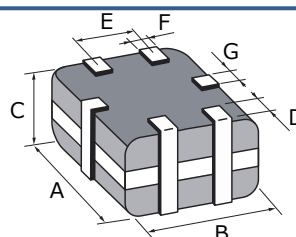
## Explanation of Part Numbers

| 1            | 2 | 3 | 4    | 5                          | 6           | 7               | 8                            | 9 | 10 | 11                                                                                                                       | 12                                               |
|--------------|---|---|------|----------------------------|-------------|-----------------|------------------------------|---|----|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| E            | X | C | 2    | 4                          | C           | S               | 9                            | 0 | 0  | U                                                                                                                        |                                                  |
| Product Code |   |   | Size | Number of Terminals        | Type        | Characteristics | Nominal Impedance            |   |    | Form                                                                                                                     | Suffix                                           |
| Noise Filter |   |   | Code | Dimensions(mm)             | 4 Terminals | C Coupled type  | S Intergrated ESD Protection |   |    | The first two digits are significant figure of impedance value, and the third one denotes the number of zeros following. |                                                  |
|              |   |   | 2    | 1.25×1.00×0.50 (L)×(W)×(H) |             |                 |                              |   |    | Code                                                                                                                     | Packing                                          |
|              |   |   |      |                            |             |                 |                              |   |    | U                                                                                                                        | Embossed Carrier Taping<br>4 mm pitch, 5,000 pcs |

## Construction

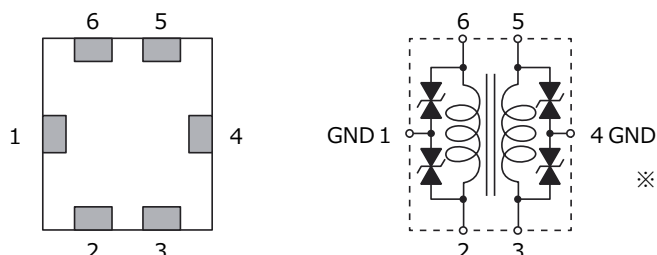


## Dimensions in mm (not to scale)



| Part No.<br>(inch size) | Dimensions(mm) |               |               |               |               |               |               | Mass<br>(Weight)<br>(mg/ pc.) |
|-------------------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------------------|
|                         | A              | B             | C             | D             | E             | F             | D             |                               |
| EXC24CS<br>(0504)       | 1.25<br>±0.15  | 1.00<br>±0.15 | 0.50<br>±0.10 | 0.20<br>±0.15 | 0.55<br>±0.10 | 0.30<br>±0.10 | 0.20<br>±0.10 | 2.4                           |

## Circuit Configuration (No Polarity)



※ The pin numbers shown here are for reference purposes only.  
Confirm the actual pin number arrangement with the exchanged specification documents.

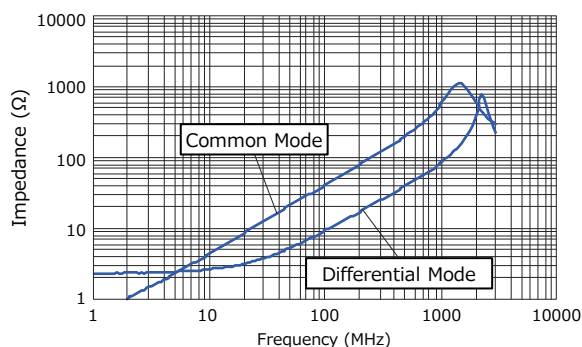
## Ratings

| Part Number | Impedance ( $\Omega$ ) at 100 MHz |                   | Rated Voltage (V) DC | Rated Current (mA) DC | DC Resistance ( $\Omega$ )max. |
|-------------|-----------------------------------|-------------------|----------------------|-----------------------|--------------------------------|
|             | Common Mode                       | Differential Mode |                      |                       |                                |
| EXC24CS350U | 35 $\Omega \pm 30\%$              | 15 $\Omega$ max.  | 5                    | 100                   | 2.0                            |
| EXC24CS900U | 90 $\Omega \pm 20\%$              | 20 $\Omega$ max.  | 5                    | 100                   | 3.0                            |

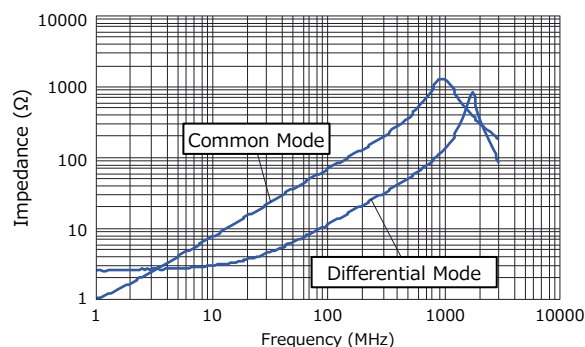
● Category Temperature Range  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$

## Impedance Characteristics (Typical)

### ● EXC24CS350U

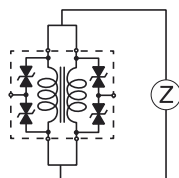


### ● EXC24CS900U

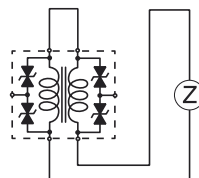


### ● Measurement Circuit

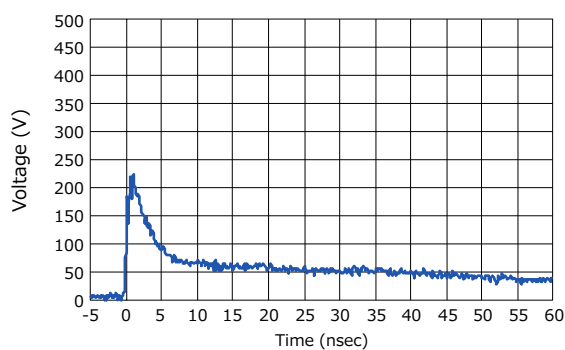
(A) Common Mode



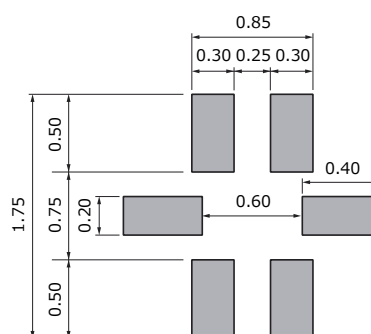
(B) Differential Mode



## ESD Suppression Characteristics (Typ. : IEC6100-4-2, 8 kV contact discharge)



## Recommended Land Pattern Design in mm (not to scale)



■ As for Packaging Methods, Soldering Conditions and Safety Precautions,  
Please see Data Files

| Performance                  |                            |                                                 |
|------------------------------|----------------------------|-------------------------------------------------|
| Test Item                    | Performance Requirements   | Test Conditions Resistance                      |
| Resistance                   | Within Specified Tolerance | 25 °C                                           |
| Overload                     | —                          | Rated Voltage                                   |
| Resistance to Soldering Heat | ±30 % (Impedance Change)   | 260 °C, 10 s                                    |
| Rapid Change of Temperature  | ±30 % (Impedance Change)   | −40 °C (30 min.) / +85 °C (30 min.), 200 cycles |
| High Temperature Exposure    | ±30 % (Impedance Change)   | 85 °C , 500 h                                   |
| Damp Heat, Steady State      | ±30 % (Impedance Change)   | 60 °C, 95 %RH, 500 h                            |
| Load Life in Humidity        | ±30 % (Impedance Change)   | 60 °C, 95 %RH, Rated Current, 500 h             |

**Guidelines and precautions regarding the technical information and use of our products described in this online catalog.**

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.
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- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

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## Safety Precautions

### (Common mode Noise Filters/Array, Common mode Noise Filters/Array with ESD Suppressor, 2 mode Noise Filters)

- When using our products, no matter what sort of equipment they might be used for, be sure to make a written agreement on the specifications with us in advance. The design and specifications in this catalog are subject to change without prior notice.
- Do not use the products beyond the specifications described in this catalog.
- This catalog explains the quality and performance of the products as individual components. Before use, check and evaluate their operations when installed in your products under the actual conditions for use.
- Install the following systems for a failsafe design to ensure safety if these products are to be used in equipment where a defect in these products may cause the loss of human life or other significant damage, such as damage to vehicles (automobile, train, vessel), traffic lights, medical equipment, aerospace equipment, electric heating appliances, combustion/gas equipment, rotating equipment, and disaster/crime prevention equipment.
  - \* Systems equipped with a protection circuit and a protection device.
  - \* Systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault.
  - \* Systems equipped with an arresting the spread of fire or preventing glitch.

### (1) Precautions for use

- These products are designed and manufactured for general and standard use in general electronic equipment (e.g. AV equipment, home electric appliances, office equipment, information and communication equipment). For applications in which special quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or cause threat of personal injury (such as for aircraft and aerospace equipment, traffic and transport equipment, combustion equipment, medical equipment, accident prevention and anti-theft devices, and safety equipment), please be sure to consult with our sales representative in advance and to exchange product specifications which conform to such applications.
- These products are not intended for use in the following special conditions. Before using the products, carefully check the effects on their quality and performance, and determine whether or not they can be used.
  1. In liquid, such as water, oil, chemicals, or organic solvent.
  2. In direct sunlight, outdoors, or in dust.
  3. In salty air or air with a high concentration of corrosive gas, such as  $\text{Cl}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{NH}_3$ ,  $\text{SO}_2$ , or  $\text{NO}_x$ .
  4. Electric Static Discharge (ESD) Environment.

These components are sensitive to static electricity and can be damaged under static shock (ESD). Please take measures to avoid any of these environments.  
Smaller components are more sensitive to ESD environment.
  5. Electromagnetic and Radioactive Environment.

Avoid any environment where strong electromagnetic waves and radiation exist.
  6. In an environment where these products cause dew condensation.
  7. Sealing or coating of these products or a printed circuit board on which these products are mounted, with resin or other materials.
- These products generate Joule heat when energized. Carefully position these products so that their heat will not affect the other components.
- Carefully position these products so that their temperatures will not exceed the category temperature range due to the effects of neighboring heat-generating components. Do not mount or place heat-generating components or inflammables, such as vinyl-coated wires, near these products.
- Note that non-cleaning solder, halogen-based highly active flux, or water-soluble flux may deteriorate the performance or reliability of the products.
- Carefully select a flux cleaning agent for use after soldering. An unsuitable agent may deteriorate the performance or reliability. In particular, when using water or a water-soluble cleaning agent, be careful not to leave water residues. Otherwise, the insulation performance may be deteriorated.
- Do not apply flux to these products after soldering. The activity of flux may be a cause of failures in these products.
- Refer to the recommended soldering conditions and set the soldering condition. High peak temperature or long heating time may impair the performance or the reliability of these products.

- Recommended soldering condition is for the guideline for ensuring the basic characteristics of the products, not for the stable soldering conditions. Conditions for proper soldering should be set up according to individual conditions.
- Do not reuse any products after removal from mounting boards.
- Do not drop these products. If these products are dropped, do not use them. Such products may have received mechanical or electrical damage.
- If any doubt or concern to the safety on these products arise, make sure to inform us immediately and conduct technical examinations at your side.

## **(2) Precautions for storage**

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of -5 °C to +40 °C and a relative humidity of 15 % to 75 %.

Even within the above guarantee periods, do not store these products in the following conditions. Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>x</sub>.
2. In direct sunlight.

## **(3) Precaution specific to this product**

1. Use rosin-based flux or halogen-free flux.
2. For cleaning, use an alcohol-based cleaning agent. Before using any other type, consult with our sales person in advance.
3. Mounting of the suppressors with excessive or insufficient wetting amount of solder may affect the connection reliability or the performance of the suppressors. Carefully check the effects and apply a proper amount of solder for use.
4. Do not apply shock to Filters or pinch them with a hard tool (e.g. pliers and tweezers). Otherwise, their bodies may be chipped, affecting their performance. Excessive mechanical stress may damage the filters. Handle with care.
7. Avoid excessive bending of printed circuit boards in order to protect the suppressors from abnormal stress.
8. Do not immerse the suppressors in solvent for a long time. Before using solvent, carefully check the effects of immersion.
9. Do not apply excessive tension to the terminals.

### **<Package markings>**

Package markings include the product number, quantity, and country of origin.  
In principle, the country of origin should be indicated in English.

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А