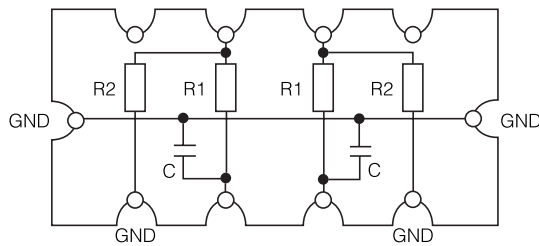


## Chip RC Networks

Type: **EZADLU**



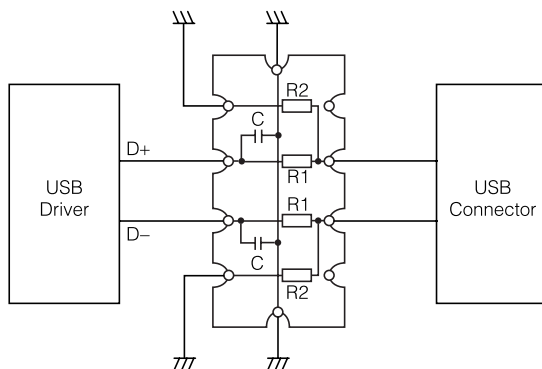
### ■ Features

1. Smallest SMD R/C filter for USB interface
- Including 2 circuits of  $\pi$  type R/C filter in a chip (Chip size: 3.2 mm × 1.6 mm)
- Space saving and low placing cost
2. Superior mountability with concave terminal
- Firm solder joint (2 times of convex terminal)
- Self-alignment of placement at reflow soldering

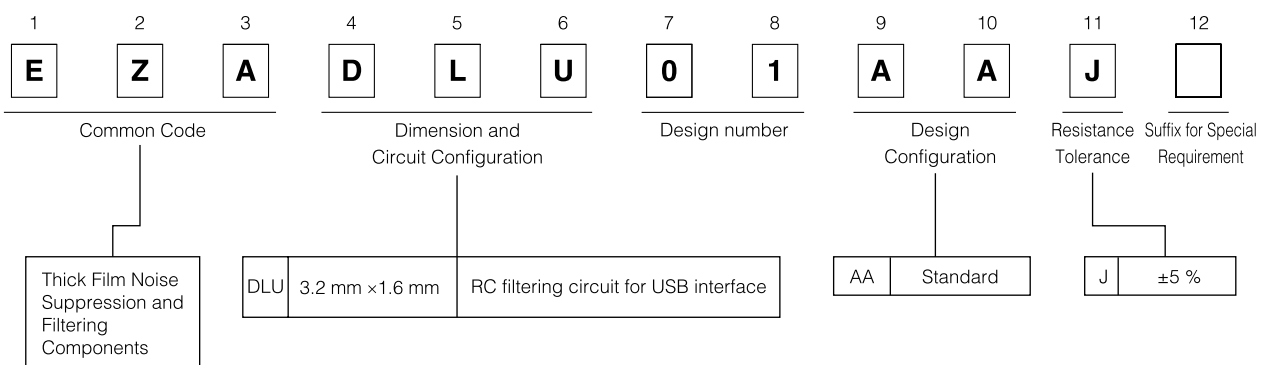
### ■ Recommended Applications

- Information and amusement equipment containing USB interface

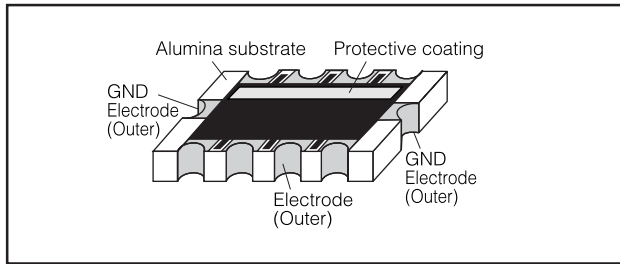
<Example for using>



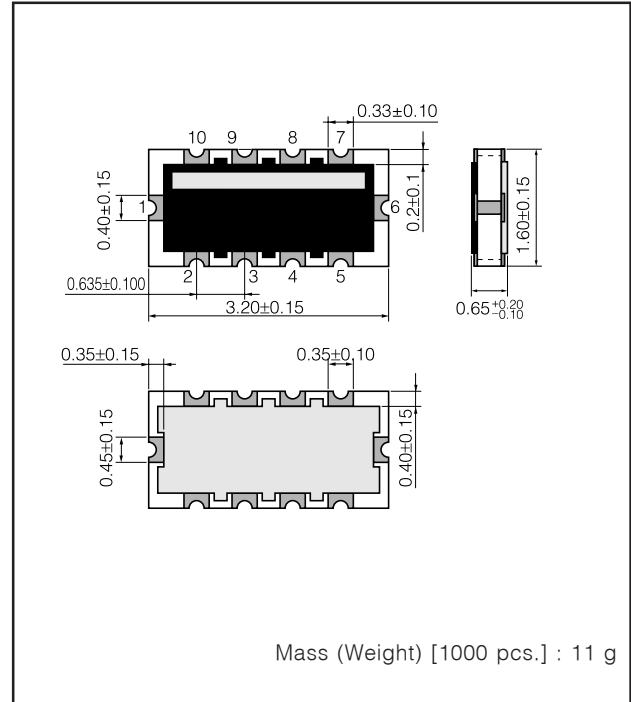
### ■ Explanation of Part Number



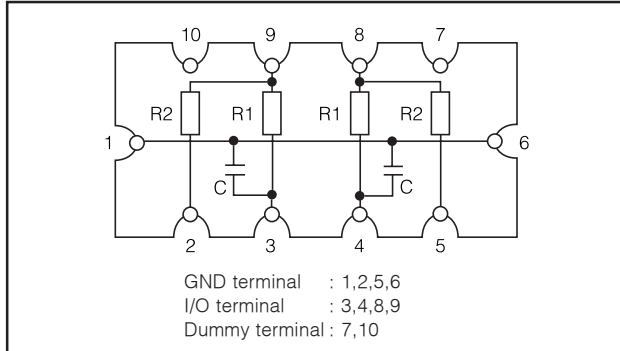
### Construction



### Dimensions in mm(not to scale)



### Circuit Configuration



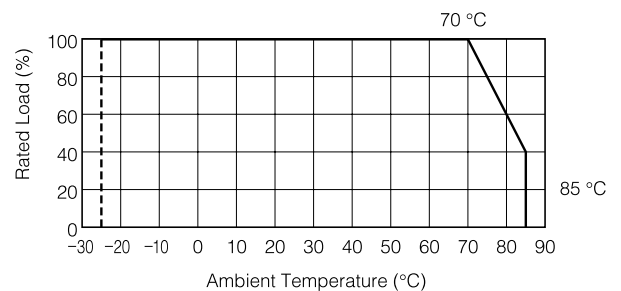
### Ratings

| Item   |   | Specification  |
|--|---|--|
| Resistor   | Resistance Values   | 10 Ω to 100 kΩ<br>Standard R1:15 Ω, 27 Ω, R2:15 kΩ   |
|  | Resistance Tolerance  | ±5 %   |
|  | Temperature Coefficient of Resistor (T.C.R.)                        | ±200 × 10 <sup>-6</sup> /°C(ppm/°C)                  |
|  | Rated Power   | 0.063 W(≤70 °C <sup>(1)</sup> )                      |
|  | Limiting Element Voltage (Maximum Rated Continuous Working Voltage) | 25 V <sup>(2)</sup>                                  |
| Capacitor  | Capacitance Values<br>(25 °C, 1 kHz <sup>(3)</sup> , 1 V rms)       | 10 pF to 100 pF<br>Standard C:47 pF                  |
|  | Capacitance Tolerance   | +30 %/-20 %  |
|  | Capacitance Temperature Characteristics                             | E Characteristic: +20 %/-55 %(-25 °C to +85 °C)      |
|  | Dissipation Factor  | Less than 3 %(25 °C, 1 kHz <sup>(3)</sup> , 1 V rms) |
|  | Rated Voltage   | 12 V   |
| Category Temperature Range (Operating Temperature Range) |   | -25 °C to +85 °C                                     |

- (1) For resistors operated in ambient temperature above 70 °C, rated power shall be derated. ("Power Derating Curve" is shown below)  
 (2) Rated Voltage for resistor shall be determined from  $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$ , or Limiting Element Voltage (Max. Rated Continuous Working Voltage) whichever less.  
 (3) In measuring at 1 MHz, Capacitance and Dissipation Factor are different.

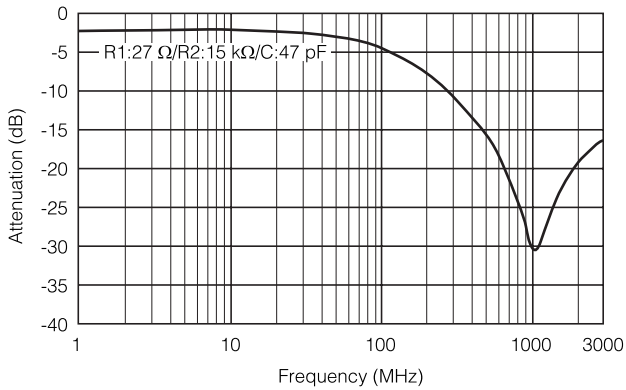
### Power Derating Curve

For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the right figure.

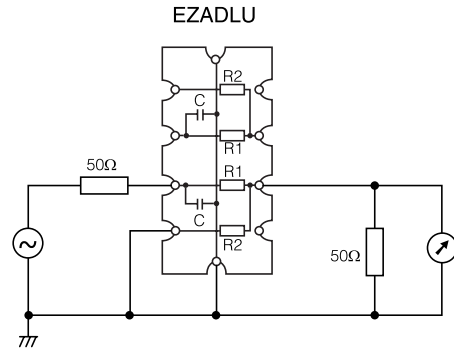


### Attenuation Characteristics

#### ● EZADLU



Measurement Circuit

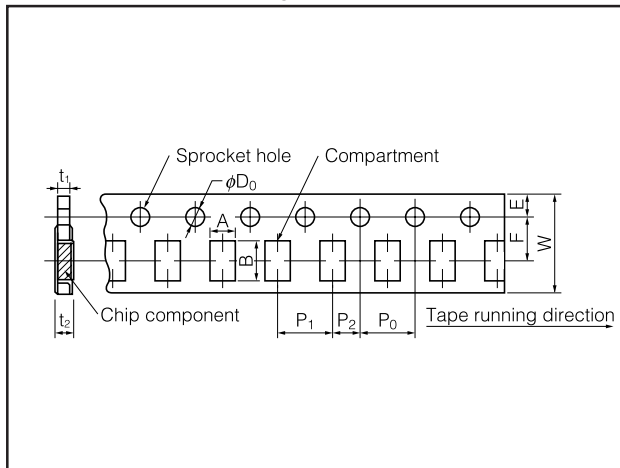


### Packaging Methods (Taping)

#### ● Standard Quantity

| Type   | Kind of Taping         | Pitch (P <sub>1</sub> ) | Quantity       |
|--------|------------------------|-------------------------|----------------|
| EZADLU | Punched Carrier Taping | 4 mm                    | 5000 pcs./reel |

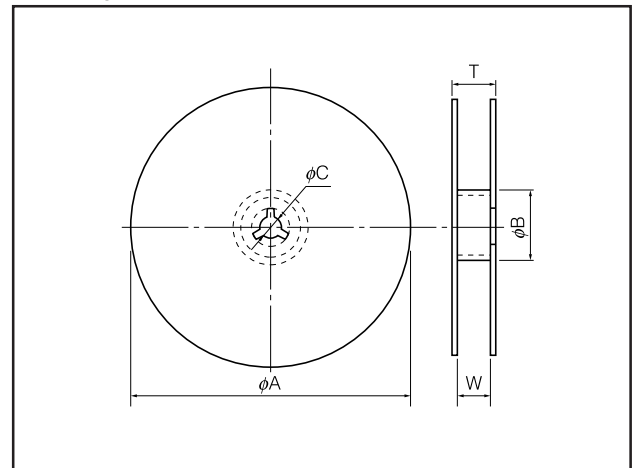
#### ● Punched Carrier Taping



|                 | Type   | A                     | B                     | W                     | F                     | E                     | P <sub>0</sub>        |
|-----------------|--------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dimensions (mm) | EZADLU | 2.00 <sup>+0.20</sup> | 3.60 <sup>+0.20</sup> | 8.00 <sup>+0.20</sup> | 3.50 <sup>+0.05</sup> | 1.75 <sup>+0.10</sup> | 4.00 <sup>+0.10</sup> |

|                 | Type   | P <sub>1</sub>        | P <sub>2</sub>        | φD <sub>0</sub>       | t <sub>1</sub>        | t <sub>2</sub>        |
|-----------------|--------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dimensions (mm) | EZADLU | 4.00 <sup>+0.10</sup> | 2.00 <sup>+0.05</sup> | 1.50 <sup>+0.10</sup> | 0.75 <sup>+0.05</sup> | 0.84 <sup>+0.10</sup> |

#### ● Taping Reel

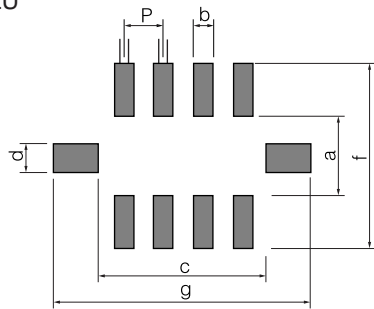


|                 | Type   | φA                                  | φB      | φC                 |
|-----------------|--------|-------------------------------------|---------|--------------------|
| Dimensions (mm) | EZADLU | 180.0 <sup>+0</sup> <sub>-3.0</sub> | 60 min. | 13 <sup>±1.0</sup> |

|                 | Type   | W                   | T                    |
|-----------------|--------|---------------------|----------------------|
| Dimensions (mm) | EZADLU | 9.0 <sup>±1.0</sup> | 11.4 <sup>±1.0</sup> |

■ Recommended Land Pattern Design

● EZADLU



■ Land pattern

|                 |            |            |            |            |
|-----------------|------------|------------|------------|------------|
|                 | a          | b          | c          | d          |
| Dimensions (mm) | 0.9 to 1.1 | 0.2 to 0.3 | 2.6 to 2.8 | 0.3 to 0.4 |
|                 | f          | g          | P          |            |
| Dimensions (mm) | 2.0 to 2.6 | 3.6 to 4.2 | 0.635      |            |

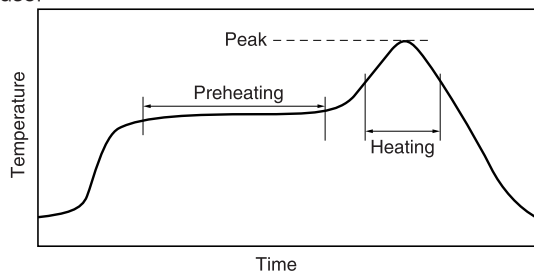
- Design to make GND pattern as large as possible, because high frequency noise is removed from GND terminals of chip RC network.

■ Recommended Soldering Conditions

Recommendations and precautions are described below.

● Recommended soldering conditions for reflow

- Reflow soldering shall be two times maximum.
- Please contact us for additional information when you use in conditions other than those specified.
- Please measure a temperature of terminations and study solderability every kind of solder and board, before actual use.



● Flow Soldering

We can not recommend the flow soldering to Chip RC Networks: EZADLU, because solder bridging may happen owing to the narrow 0.635 mm pitch.

For solder (Example : Sn/Pb)

|              | Temperature      | Time          |
|--------------|------------------|---------------|
| Preheating   | 140 °C to 160 °C | 60 s to 120 s |
| Main heating | Above 200 °C     | 30 s to 40 s  |
| Peak         | 235 ± 5 °C       | max. 10 s     |

For lead-free solder (Example : Sn/Ag/Cu)

|              | Temperature      | Time          |
|--------------|------------------|---------------|
| Preheating   | 150 °C to 180 °C | 60 s to 120 s |
| Main heating | Above 230 °C     | 30 s to 40 s  |
| Peak         | max. 260 °C      | max. 10 s     |

This product has circuits on both sides. Do not use adhesives, because we are afraid that characteristics is impaired by adhesives.

⚠ Cautions for Safety

The following are precautions for individual products. Please also refer to the precautions common to CR Combinations, Fuses, and Sensors shown on page EX3 of this catalog.

1. Take measures against mechanical stress during and after mounting of Chip RC Networks (hereafter called the RC Networks) so as not to damage their electrodes and protective coatings.  
Be careful not to misplace the RC Networks on the land patterns. Otherwise, solder bridges may be caused.
2. Do not use halogen-based or other high-activity flux. Otherwise, the residue may impair the RC Networks' performance and/or reliability.
3. Perform sufficient preheating so that the difference of the solder temperature and the RC Networks chip surface temperature becomes 100 °C or less. Maintain the temperature difference within 100 °C during rapid cooling by immersion into solvent after soldering.
4. When soldering with a soldering iron, never touch the RC Networks' bodies with the tip of the soldering iron. When using a soldering iron with a high temperature tip, finish the soldering as quickly as possible (within three seconds at 350 °C max.).
5. As the amount of applied solder becomes larger, the mechanical stress applied to the RC Networks increases, causing problems such as cracks and faulty characteristics. Avoid applying an excessive amount of solder.
6. Do not apply a shock to the RC Networks or pinch them with a hard tool (e.g. pliers and tweezers). Otherwise, the RC Networks' protective coatings and bodies may be chipped, affecting their performance.
7. Avoid excessive bend of printed circuit boards in order to protect the RC Networks from abnormal stress.
8. The static capacitance may decrease by a few percent from the time of shipment due to the characteristics peculiar to dielectric materials having a high dielectric constant.

## ⚠ Caution for Safety (Common precautions for CR Combinations, Fuses, and Sensors)

- 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.
- 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

### (1) Precautions for use

- These products are designed and manufactured for general purpose and standard use in general electronic equipment (e.g. AV equipment, home electric appliances, office equipment, information and communication equipment)
- 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 Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>
  4. In an environment where strong static electricity or electromagnetic waves exist
  5. In an environment where these products cause dew condensation
  6. 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 (except Thermal Cutoffs).
- 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.

### (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 35 °C and a relative humidity of 45 % to 85 %.

The performance of Combinations(EMI Filters) is guaranteed for 6 months or a year from the outgoing inspection date indicated on the packages, provided that they are stored at a temperature of -5 °C to +40 °C and a relative humidity of 40 % to 60 %. Check the guarantee period in the specifications. The performance of Thermal Cutoffs is guaranteed for a year from the outgoing inspection date indicated on the packages, provided that they are stored at a temperature of -10 °C to +40 °C and a relative humidity of 30 % 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>2</sub>
2. In direct sunlight

### <Package markings>

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