

# MAX ECHO 鈺鎧科技股份有限公司規格標準書

## COMPONENT SPECIFICATION

版次：第1.3版

MAX ECHO

|      |  |                         |                |     |
|------|--|-------------------------|----------------|-----|
| Name | Wirewound Common Mode Filter<br>AEOI4532 | COMPONENT SPECIFICATION |                | 1/9 |
|      |  | SPEC#                   | AEOI4532-101NZ |     |

### 1. SCOPE

This specification applies to the AEOI4532 series SMD Wirewound Common Mode Filter.

### 2. STANDARD ATMOSPHERIC CONDITIONS

Unless otherwise specified the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient temperature :  $20 \pm 15^{\circ}\text{C}$

Relative humidity :  $65 \pm 20\%$

If there may be any doubt on the results, measurements shall be made within the following limits :

Ambient temperature :  $25 \pm 5^{\circ}\text{C}$

Relative humidity :  $75 \pm 10\%$

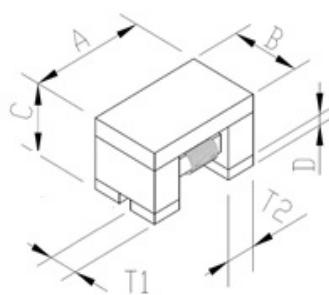
### 3. RATINGS

| PART NO.       | INDUCTANCE<br>AT 100 KHz / 100mV | IMPEDANCE<br>AT 10MHZ ( $\Omega$ )min | DC RESISTANCE<br>( $\Omega$ ) MAX | RATED CURRENT<br>(mA) MAX | RATED VOLTAGE<br>(V) | INSULATION RESISTANCE<br>(M $\Omega$ ) MIN | Withstanding TEST VOLTAGE<br>(V)(DC) MAX |
|----------------|----------------------------------|---------------------------------------|-----------------------------------|---------------------------|----------------------|--|--|
| AEOI4532-101NZ | 100 $\mu\text{H}$<br>-30%/+50%   | 2000                                  | 2                                 | 200                       | 50                   | 10   | 125                                      |

### 4. DIMENSION

OPERATING TEMP. RANGE :  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

STORAGE TEMP. RANGE :  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$



|        |          |                     |                     |                     |
|--------|----------|---------------------|---------------------|---------------------|
| unit:  | TYPE     | A                   | B                   | C                   |
| mm     | AEOI4532 | $4.5 \pm 0.2$       | $3.2 \pm 0.2$       | $2.6 \pm 0.2$       |
| (inch) |          | (0.177 $\pm$ 0.008) | (0.126 $\pm$ 0.008) | (0.102 $\pm$ 0.008) |

|        |          |                    |                     |                     |
|--------|----------|--------------------|---------------------|---------------------|
| unit:  | TYPE     | D                  | T1                  | T2                  |
| mm     | AEOI4532 | $0.5 \pm 0.1$      | $0.85 \pm 0.2$      | $0.6 \pm 0.2$       |
| (inch) |          | (0.02 $\pm$ 0.004) | (0.033 $\pm$ 0.008) | (0.024 $\pm$ 0.008) |

### 5. The place of origin :

Taichung, Taiwan

|            |            |             |               |
|------------|------------|-------------|---------------|
| PLANNED BY | CHECKED BY | APPROVED BY | 鈺鎧文件中心<br>發行章 |
| Sam        | LUN        | Jeffery     |               |

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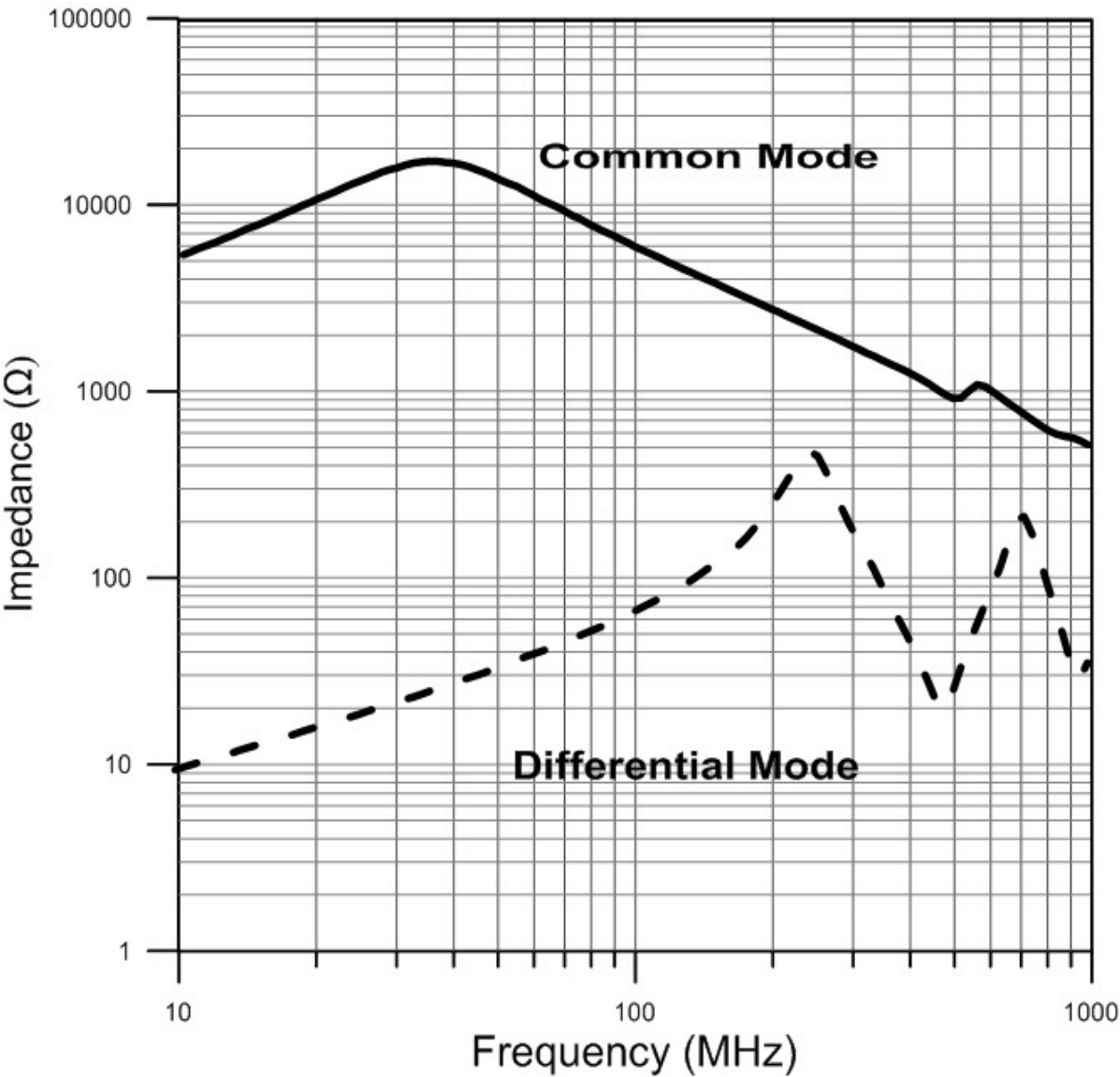
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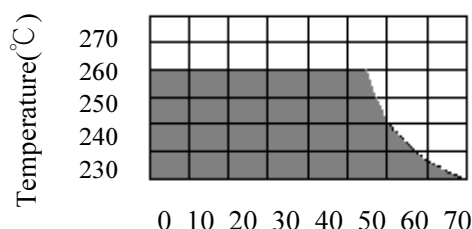
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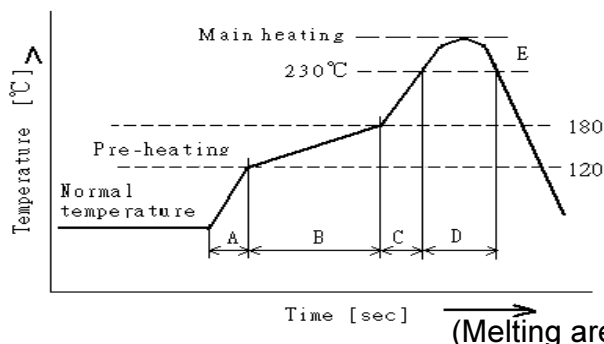
|      |  |                         |                |     |
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### Reflow soldering conditions

- Pre-heating should be in such a way that the temperature difference between solder and ceramic surface is limited to 150°C max. Also cooling into solvent after soldering should be in such a way that the temperature difference is limited to 100°C max. Insufficient pre-heating may cause cracks on the ceramic, resulting in the deterioration of product quality.
- Products should be soldered within the following allowable range indicated by the slanted line. The excessive soldering conditions may cause the corrosion of the electrode, when soldering is repeated, allowable time is the accumulated time.



### Temperature Profile



|                 |                     |            |        |
|-----------------|---------------------|------------|--------|
| A               | Slope of temp. rise | 1 to 5     | °C/sec |
| B               | Heat time           | 50 to 150  | sec    |
|                 | Heat temperature    | 120 to 180 | °C     |
| C               | Slope of temp. rise | 1 to 5     | °C/sec |
| D               | Time over 230°C     | 90~120     | sec    |
| E               | Peak temperature    | 255~260    | °C     |
|                 | Peak hold time      | 10 max.    | sec    |
| No. of mounting |                     | 3          | times  |

### Reworking with soldering iron

|                       |                 |
|-----------------------|-----------------|
| Preheating            | 150°C, 1 minute |
| Tip temperature       | 280°C max.      |
| Soldering time        | 3 seconds max.  |
| Soldering iron output | 30w max.        |
| End of soldering iron | f 3mm max.      |

Reworking should be limited to only one time.

Note : Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the ferrite material due to the thermal shock.

### Solder Volume

Solder shall be used not to be exceed the upper limits as shown below.



When solder volume is increased, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance.

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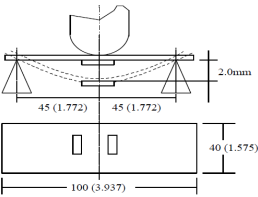
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### Mechanical Characteristics

| ITEM                           | CONDITION  | SPECIFICATION   |
|--------------------------------|--|---|
| Flexure Strength               |   | Change In Appearance<br>Without distinct damage<br><br>Change In Common Mode Impedance:<br>Within $\pm 20\%$        |
| Drop Test                      | Components shall be dropped three times on a concrete or steel board at height of 1m naturally at any directions.  | Insulation Resistance:<br>10M $\Omega$ min<br><br>Withstanding Voltage:<br>No damaged                               |
| Vibration (Random)             | 1.Frequency and Amplitude:10-2000-10Hz<br>2.Direction:X,Y,Z.<br>3.Test duration:5g's for 20 minutes , 12 cycles each of 3 orientations.  |   |
| Resistance to Soldering Heat   | Preheat components at 80 to 120°C for 1 minute. Dip components into flux and then into a melted solder bath at $260 \pm 5^\circ\text{C}$ for $5 \pm 1$ seconds. Then components are to be tested after 4-48 hours at room temperature. |   |
| Solderability                  | Dip pads in flux and then in a solder bath at $240 \pm 5^\circ\text{C}$ for 5 seconds.   |   |
| Component Adhesion (Push Test) | Components shall be reflow solder onto a P.C. Board ( $240 \pm 5^\circ\text{C}$ for 20 seconds). Then a dynamometer force gauge shall be applied to any side of the component.   | Components must withstand a minimum force of 0.5 Kg without any failure of the termination to component attachment. |

### Electrical Characteristics

| ITEM  | CONDITION  | SPECIFICATION                                      |
|---|--|--|
| Common Mode Impedance ( $Z_c$ ) and Tolerance | Measuring Equipment : E4991 or equivalent.<br>Measuring Frequency : $100 \pm 1\text{MHz}$<br>Measuring Temperature : $25 \pm 5^\circ\text{C}$<br>(Refer to Measurement Diagram ) | Within $\pm 25\%$                                  |
| Insulation Resistance                         | Measuring Voltage : Rated Voltage<br>Measuring Time : 1 minute max.<br>(Refer to Measurement Diagram )   | 10 megaohms minimum                                |
| Withstanding Voltage                          | Test Voltage :Withstanding Voltage<br>Time : 1 to 5 seconds.<br>Charge current : 1mA max.<br>(Refer to Measurement Diagram )   | No damage occurs when the test voltage is applied. |
| Rated Current                                 | Test Current : Rated Current<br>(Refer to Measurement Diagram )  | Temperature Rise : $\leq 15^\circ\text{C}$         |
| DC Resistance (RDC)                           | Measured with current of 100mA max.<br>In case of doubt, measured by four terminal method.<br>(Refer to Measurement Diagram )  | Within Specified Tolerance.                        |

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|   | AEOI4532   | SPEC#  | AEOI4532-101NZ |     |
| Endurance Characteristics                         |  |  |                |     |
| ITEM  | CONDITION  | SPECIFICATION  |                |     |
| Cold Temperature Storage                          | Components shall be stored at temperature of -40 ± 2°C for 1000 (+48 hours -0 hour). Then components shall be subjected to standard atmospheric conditions for 4-48 hours. After that, measurement shall be made.  | Change In Appearance<br>Without distinct damage<br><br>Common Mode<br>Impedance: Within ± 20%<br><br>Insulation Resistance:<br>10MΩ min<br><br>Withstanding Voltage:<br>No damaged |                |     |
| High Temperature Storage                          | Components shall be stored at temperature +85 ± 2°C for 1000 (+48 hours -0 hour). Then components shall be subjected to standard atmospheric conditions for 4-48 hours. After that, measurement shall be made.   |  |                |     |
|   | Components shall be stored in the chamber at 40°C at 90-95% R. H. for 1000 (+48 hours -0 hour). Then components are to be tested after 4-48 hours at room temperature.   |  |                |     |
| Temperature Cycle                                 | Each cycle shall consist of 30 minutes at -40°C followed by 30 minutes at +85°C with a 10-15 minutes maximum transition time between temperature extremes. Test duration is 100 cycles, then components are to be tested after 4-48 hours at room temperature. |  |                |     |
| High Temperature with Loaded<br>( Rated Current ) | Components shall be stored at temperature of +85 ± 2°C for 1000 (+48 hours -0 hour). with rated current applied. Then components shall be subjected to standard atmospheric conditions for 4-48 hour. After that, measurement shall be made.                   |  |                |     |

表格編號：034承認書 A

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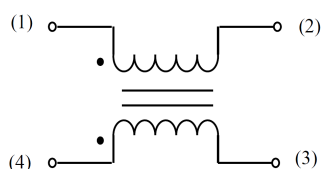
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### Measurement Diagram

#### EQUIVALENT CIRCUIT



No polarity

Terminal to be Tested

When measuring and supplying the voltage, the following terminal is applied.

| No. | Item  | Terminal to be Tested |
|-----|---|-----------------------|
| 1   | Common Mode Impedance<br>( Measurement Terminal ) | Terminal  Terminal    |
| 2   | Withstanding Voltage<br>( Measurement Terminal )  | Terminal  Terminal    |
| 3   | DC Resistance<br>( Measurement Terminal )         | Terminal  Terminal    |
| 4   | Rated Current                                     |                       |
| 5   | Insulation Resistance                             | Terminal  Terminal    |

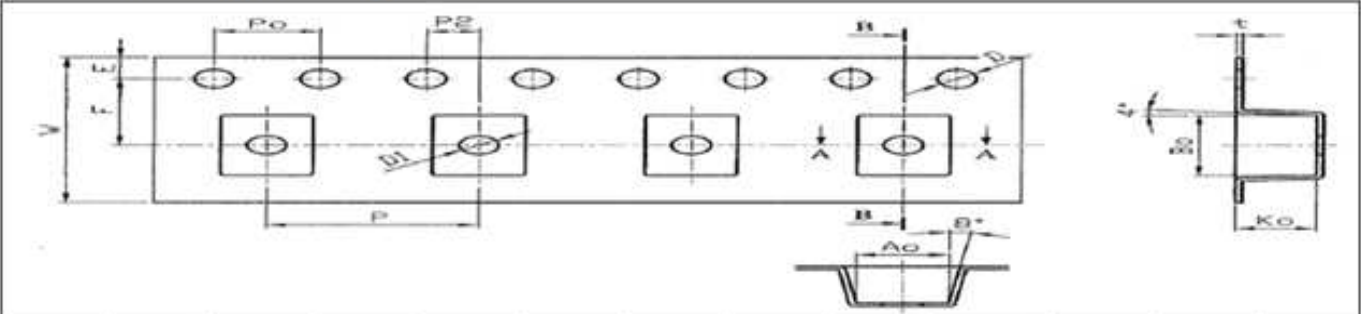
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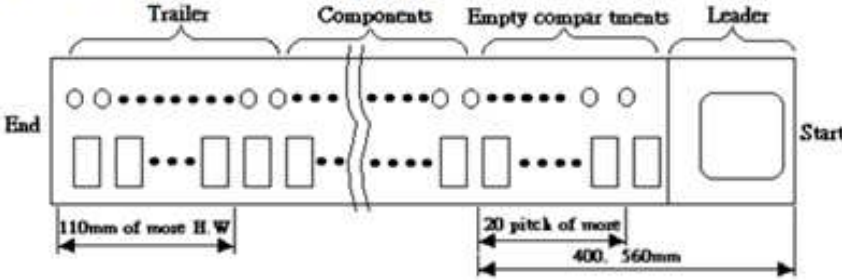
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PAPER CARRIER TAPE PACKAGING



| Ao    | Bo    | Ko    | t     | W     | P     | E     | F     | P2    | D            | D1    | Po    | 10Po  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|-------|-------|-------|
| 3.60  | 4.90  | 3.00  | 0.26  | 12.00 | 8.00  | 1.75  | 5.50  | 2.00  | 1.50         | 1.50  | 4.00  | 40.00 |
| ±0.10 | ±0.10 | ±0.10 | ±0.05 | ±0.10 | ±0.10 | ±0.10 | ±0.05 | ±0.05 | +0.1 / -0.00 | ±0.10 | ±0.10 | ±0.20 |

10-2 LEADER AND TRAILER TAPE



10-3 DIRECTION THE DIRECTION SHALL BE SEEN FROM THE TOP OF COVER TAPE



10-4 REELS

PACKING QTY.  
500 PCS REEL

The diagram shows a top view of a reel with dimensions: 2±0.5, 13.0±0.5, R1.0, 21±0.8, A, W1, and W2.

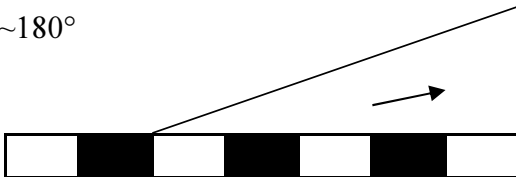
UNIT:mm

|    |      |
|----|------|
| A  | 178  |
| N  | ±2.0 |
| N  | 50   |
| N  | MIN  |
| W1 | 10   |
| W1 | ±1.5 |
| W2 | 20   |
| W2 | MAX  |

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| <div>PEELING STRENGTH OF COVER TAPE</div> <div><div>Cover tape (10g~100g)</div><div>165°~180°<br/></div></div> <div>Test condition</div> <div><div>1. peel angle : 165°~180° vs carrier tape</div><div>2. peel speed : 300mm/min</div></div> <div>Packaging</div> <div><div>1.) Tape &amp; Reel packaging in component specification 6/8</div><div>2) Reel and a bag of desiccant shall be packed in Nylon or plastic bag</div><div>3) Maximum of 5 reels shall be packaged in a inner box</div><div>4) Maximum of 10 inner box shall be packaged in a outer box</div></div> <div>Reel Label</div> <div>Producing the goods label needs to indicate (1 ) Pb Free (2) RoHS Compliant</div> |  |                         |                |       |



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### Storage

1. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Packages must be stored at 40°C or less and 70% RH or less.
2. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust or harmful gas (hydrogen chloride, sulfurous acid gas or hydrogen sulfide).
3. Packaging material may be deformed if packages are stored where they are exposed to heat or direct sun — light.
4. Minimum packages, such as polyvinyl heat — seal packages shall not be opened until just before they are used.  
If opened, use the reels as soon as possible.
5. Solderability specified in component specification 3/8 shall be for 12 months from the date of delivery on condition that they are stored at the environment specified clause 1. & 2.  
For those parts which passed more than 12 months shall be checked solderability before it is used.

### Quality System

- ISO/IATF16949
- IECQ QC 080000
- AEC-Q200 COMPLIANT

### Recommended Land Pattern Dimension

| Metric (EIA) | A mm<br>(inches) | B mm<br>(inches) | C mm<br>(inches) | D mm<br>(inches) | E mm<br>(inches) |
|--------------|------------------|------------------|------------------|------------------|------------------|
| 4532 (1812)  | 3.5<br>(0.137)   | 1.2<br>(0.047)   | 2.10<br>(0.082)  | 0.70<br>(0.027)  | 0.70<br>(0.027)  |

