

**RoHS Compliant**  
Directive 2011/65/EU

## REFERENCE SPECIFICATION

Customer \_\_\_\_\_

|                      |                |
|----------------------|----------------|
| Item                 | CRYSTAL UNIT   |
| Type                 | NX2012SA       |
| Nominal Frequency    | 32.768kHz      |
| Customer's Spec. No. | ---            |
| NDK Spec. No.        | EXS00A-MU00185 |

For your reference we submit this specification.  
Please study and keep in your related document file.

Charge:

|          |  |  |
|----------|--|--|
| Sales    |  |  |
| Engineer |  |  |

Approved

H.Matsudo

Checked

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Drawn

Y.Hasuike

### Revision Record

| Rev. | Rev. Date   | Items | Contents | Remarks |
|------|-------------|-------|----------|---------|
| ---  | 29.Sep.2011 | Issue | ---      | ---     |

1. Customer specifications number : ---
2. NDK specification number : EXS00A-MU00185
3. Type : NX2012SA
4. Electrical characteristics
- 4.1. Nominal Frequency ( $F_0$ ) : 32.768 kHz
- 4.2. Overtone Order : Fundamental
- 4.3. Adjustment tolerance :  $\pm 20 \times 10^{-6}$  Max. (at +25°C)
- 4.4. Turning Point : +25°C $\pm$ 5°C
- 4.5. Temperature coefficient :  $-0.04 \times 10^{-6} / ^\circ\text{C}^2$  Max.
- 4.6. Equivalent Resistance ( $R_R$ ) : Typ: 60 k $\Omega$   
:80 k $\Omega$  Max.
- 4.7. Insulation Resistance : Terminal to terminal insulation resistance also  
terminal to cover insulation resistance must be  
500M $\Omega$  (Min.) when DC100V  $\pm$ 15V is applied.
5. Measurement circuit
- 5.1. Frequency measurement
- Measuring instrument : Network Analyzer  
(CNA-LF made in Transat corp.)
- Load capacitance ( $C_L$ ) : 9.0pF
- Level of drive : 0.1  $\mu$ W
- 5.2. Equivalent resistance measurement
- Measuring instrument : Network Analyzer  
(CNA-LF made in Transat corp.)
- Load capacitance ( $C_L$ ) : Series
- Level of drive : 0.1  $\mu$ W
6. Other performances
- 6.1. Operating Temperature range : - 40 to + 85°C
- 6.2. Storage Temperature range : - 40 to + 85°C
- 6.3. Maximum drive level : 0.5  $\mu$ W Max.
- 6.4 Aging (at +25 °C) :  $\pm 3 \times 10^{-6}$  Max. / 1 year
7. Examination results document  
Since a performance is guaranteed, an examination results document does not submit.
8. Application drawing
- 8.1. Dimension drawing : EXD14B-00387
- 8.2. Taping and reel figure : EXK17B-00273
- 8.3. Marking Structure : EXH11B-00366
- 8.4. Taping repair method : EEK17B-00010

9. Notice

- 9.1 Order items are manufactured according to specification. As to conditions, which are not indicated in this specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.
- 9.2 Unless we receive request for modification within 3 weeks from the issue date of this NDK specification sheet, we will supply products according to this specification. Also, if you'd like to modify specification of order, which has been placed with delivery request within 3 weeks from the issue data of this specification sheet, we would like to discuss with you separately.
- 9.3 In no event shall the company be liable for any product failure resulting from an inappropriate handling or operation of the product beyond the scope of its guarantee.
- 9.4 Where any change to the process condition is made due to the change(s) in the production line, inform personnel of the specifications.
- 9.5 Should this specification data give rise to any disputes relating to any intellectual property rights or any other rights of a third person, the company shall not indemnify anyone for any damage. Their disclosure must not be construed as the grant of a license to use any of the intellectual property rights owned by the company.
- 9.6 If you intend to use products listed on this specification for applications that may result in loss of life or assets (controls relating to safety, medical equipment, aeronautical equipment, space equipment, etc.), please do not fail to advise us of your intention beforehand.
- 9.7 In the company's production process whatever amount of ozone depleting substances (ODS) as specified in the Montreal protocol is not used.
- 9.8 Information contained in this specification must not be quoted, reproduced or used for other purposes including processing either in part or in full without obtaining prior approval from the company.

10. Prohibited items

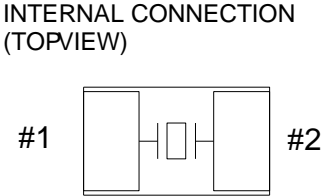
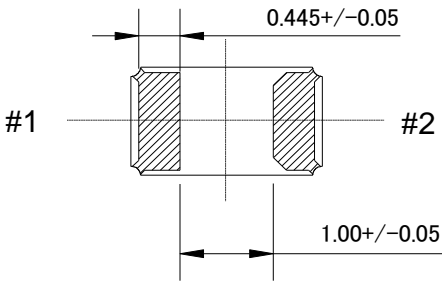
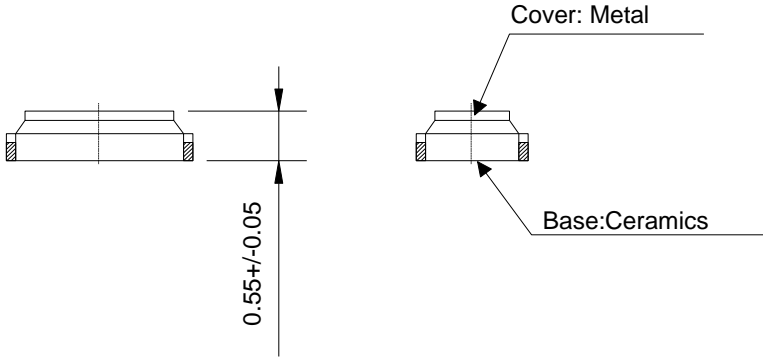
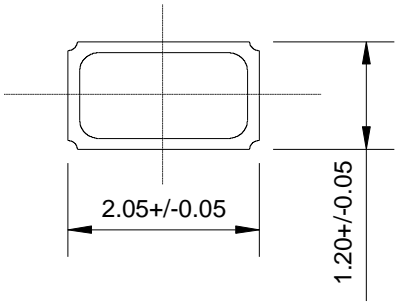
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(1)Reflow soldering heat resistance

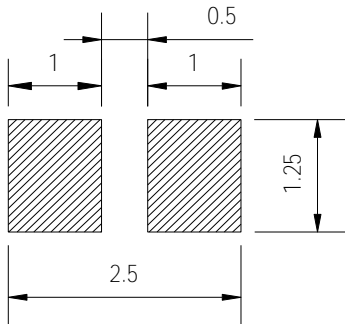
- Peak temperature: 265°C, 10 sec
- Heating: 230°C or higher, 30 sec
- Preheating: 150°C to 180°C, 120 sec
- Reflow passage times: Two times

(2)Manual soldering heat resistance

- Pressing a soldering iron of 400°C on the terminal electrode for four seconds (twice).

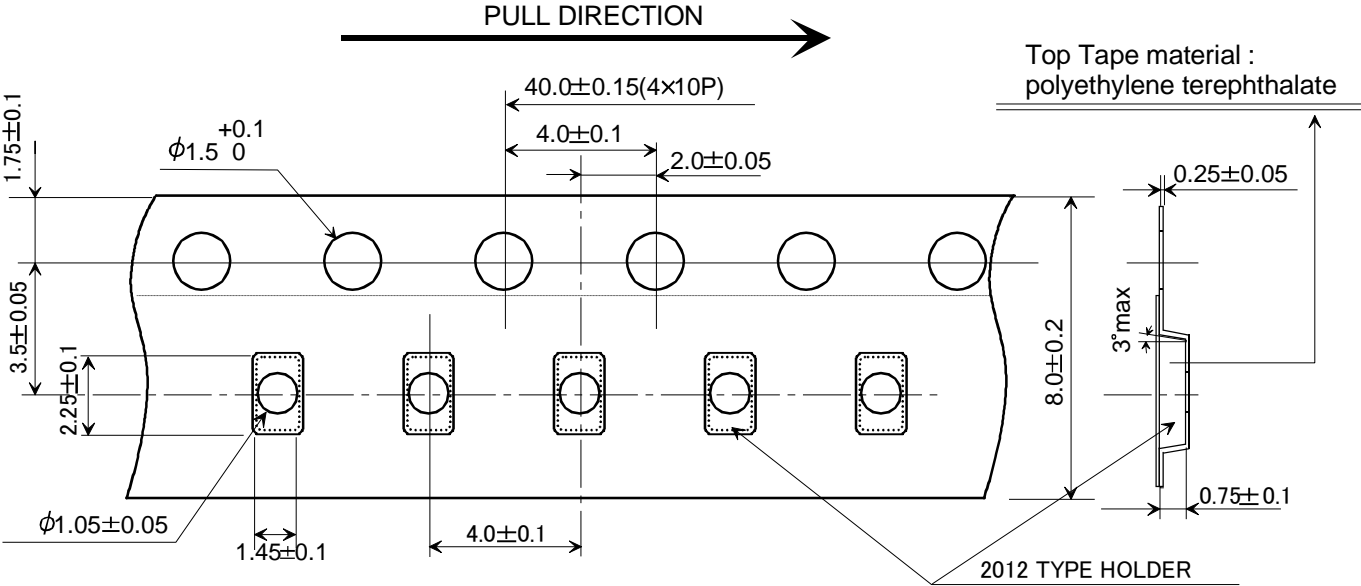


Recommended soldering pattern

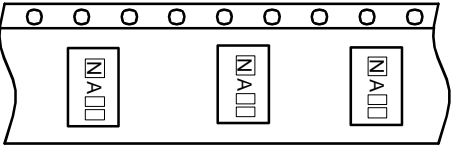


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|----------|---------------------|--------------|-----------------------------|-----------------|-----------|
|          | 改訂日/ Date of Revise | 担当/ Charge   | 承認/ Approved                | 理由/ Reason      |           |
| B        | 7.Jan2011           | S. Kawanishi | M. Umeki                    | 全面改訂            |           |
|          | Date                | Name         | 三角法/ Third Angle Projection | 公差/ Tolerance   | 尺度/ Scale |
| Drawn    | 17.July.2007        | S.Kawanishi  | 単位:mm                       | $\pm 0.2$       | 10 / 1    |
| Designed | 17.July.2007        | S.Kawanishi  | 名称/Title                    | 図番/ Drawing No. | 改訂/ Rev.  |
| Checked  | 17.July.2007        | M.Yoshimatsu | 外観寸法図                       | EXD14B-00387    | B         |
| Approved | 17.July.2007        | K.Ono        |                             |                 |           |

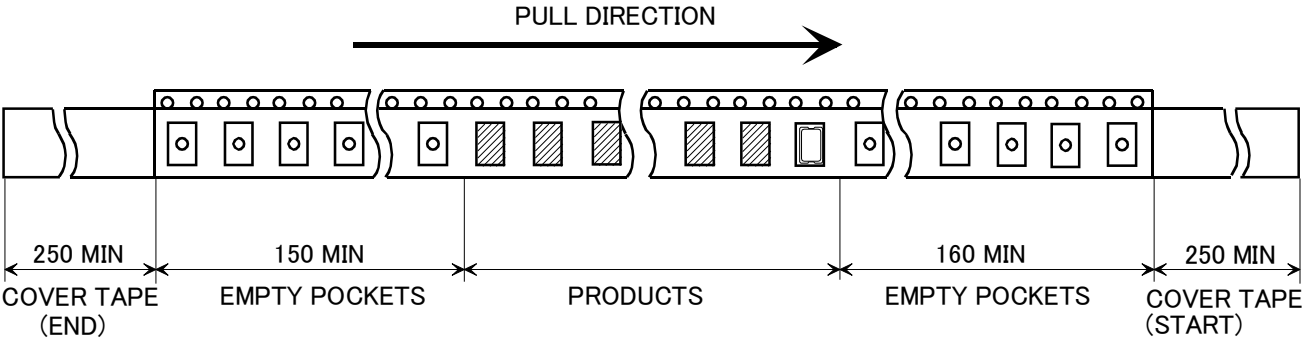
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**NIHON Dempa Kogyo Co., Ltd.**



DIRECTION OF UNIT

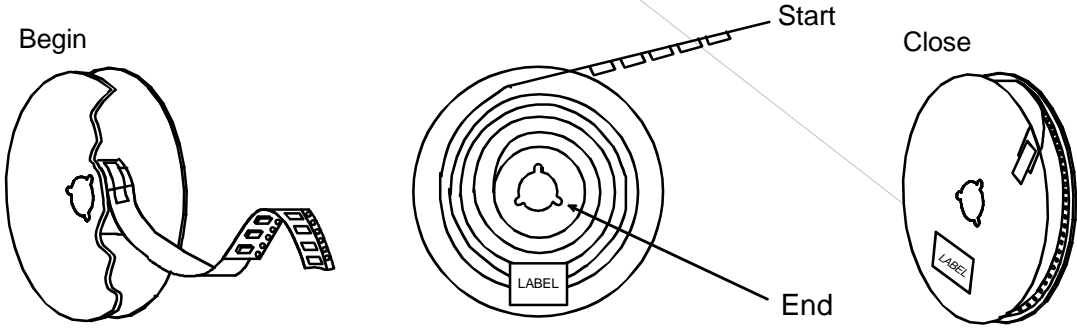
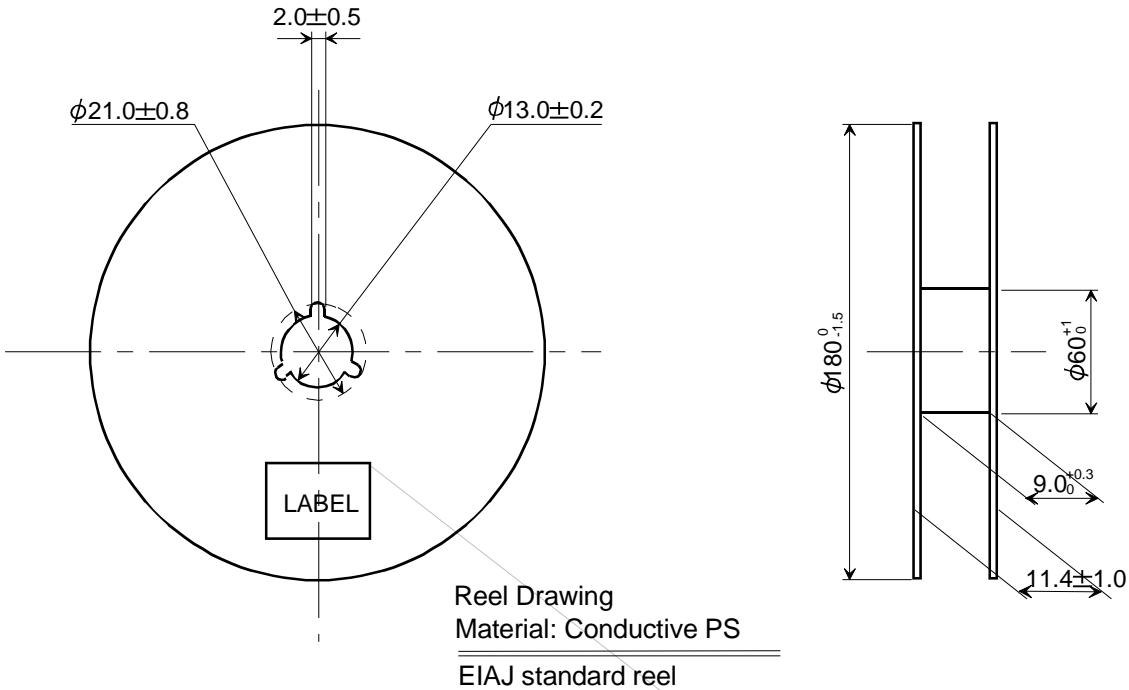


TAPING material: Conductive PS



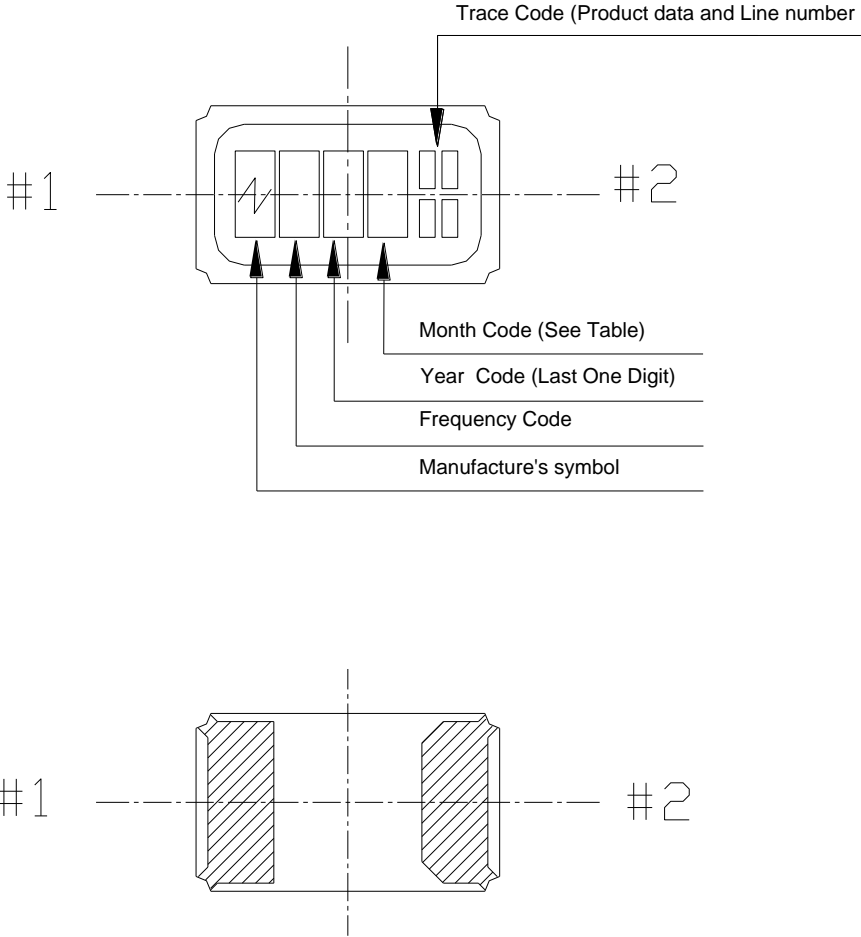
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|---------------------|------|------------|--|------------------|-----------|
| 改訂日/ Date of Revise |      | 担当/ Charge | 承認/ Approved   | 理由/ Reason       |           |
| Drawn               | Date | Name       | 三角法/ Third Angle Projection                            | 公差/ Tolerance    | 尺度/ Scale |
| Designed            |      |            | 単位:mm  |                  | /         |
| Checked             |      |            | 名称/Title   | 図番/ Drawing No.  | 改訂/ Rev.  |
| Approved            |      |            | 2012TYPE テープソック・リール図<br>2012 TYPE Taping and Reel Spec | EXK17B-00273 1/2 |           |

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|                     |  |            |  |  |           |
|---------------------|--|------------|--|--|-----------|
| 改訂日/ Date of Revise |  | 担当/ Charge | 承認/ Approved   | 理由/ Reason                                 |           |
| Date                |  | Name       | 三角法/ Third Angle Projection                                      | 公差/ Tolerance                              | 尺度/ Scale |
| Drawn               |  |            | 単位:mm  |  | /         |
| Designed            |  |            | 名称/Title<br>2012TYPE テープ・リール図<br>2012 TYPE Taping and Reel Spec. | 図番/ Drawing No.<br><b>EXK17B-00273 2/2</b> | 改訂/ Rev.  |
| Checked             |  |            |  |  |           |
| Approved            |  |            |  |  |           |

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NOTE

1. Month Code

|            |           |           |           |           |          |           |           |           |           |            |            |            |
|------------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|------------|------------|------------|
| Month      | 1<br>Jan. | 2<br>Feb. | 3<br>Mar. | 4<br>Apr. | 5<br>May | 6<br>June | 7<br>July | 8<br>Aug. | 9<br>Sep. | 10<br>Oct. | 11<br>Nov. | 12<br>Dec. |
| Month Code | 1         | 2         | 3         | 4         | 5        | 6         | 7         | 8         | 9         | X          | Y          | Z          |

2. Frequency Code

A : 32.768kHz

3. Marking Method

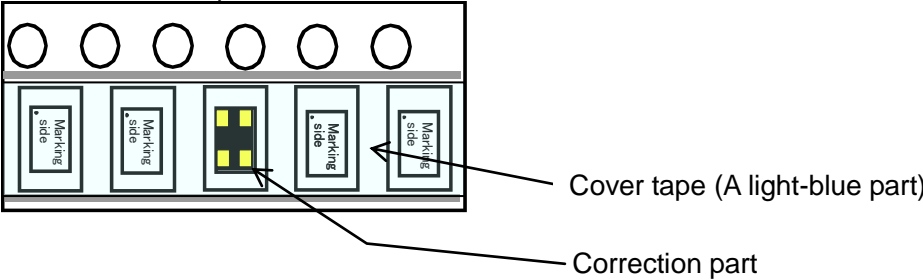
Marking Method is Laser Trimming.

|                     |  |            |  |                             |  |                     |  |
|---------------------|--|------------|--|-----------------------------|--|---------------------|--|
| 改訂日/ Date of Revise |  | 担当/ Charge |  | 承認/ Approved                |  | 理由/ Reason          |  |
| Date                |  | Name       |  | 三角法/ Third Angle Projection |  | 公差/ Tolerance       |  |
| Drawn               |  |            |  | 単位:mm                       |  | 尺度/ Scale           |  |
| Designed            |  |            |  | 名称/Title                    |  | 図番/ Drawing No.     |  |
| Checked             |  |            |  | <b>Marking Drawing</b>      |  | <b>EXH11B-00366</b> |  |
| Approved            |  |            |  |                             |  |                     |  |

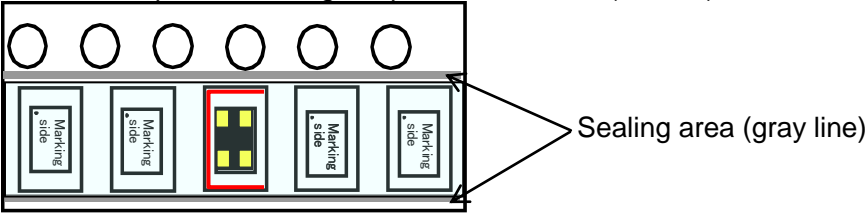
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# Taping repair method

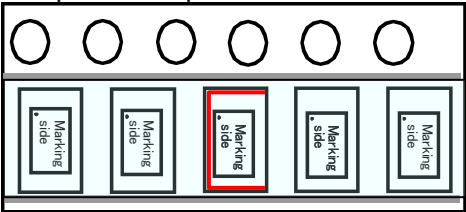
1. Occurrence of product turn-over or other errors.



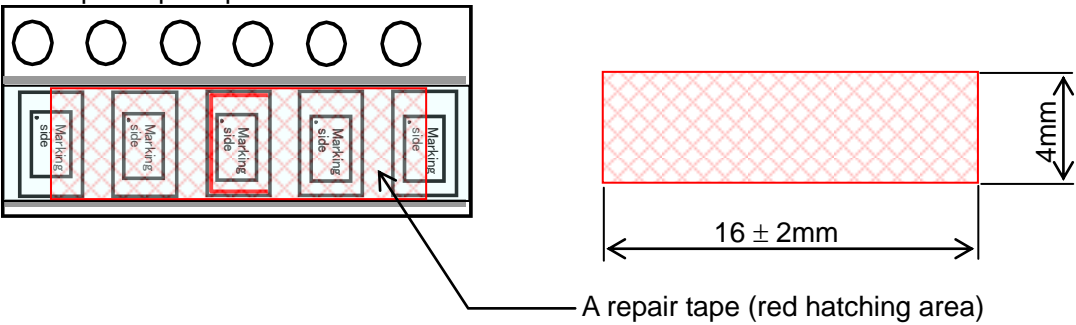
2. A cover tape is cut along the part of a red line. (3 sides)



3. A product is put back in the correct position.



4. A repair tape is pasted on a correction area.



|          |                |             |                               |                                    |       |
|----------|----------------|-------------|-------------------------------|------------------------------------|-------|
|          | Date of Revise | Charge      | Approved                      | Reason                             |       |
| A        |                |             |                               |                                    |       |
|          | Date           | Name        | Third Angle Projection        | Tolerance                          | Scale |
| Drawn    | 26 Feb. 2010   | H. Ohkubo   | Dimension:mm                  | -----                              | ----- |
| Designed | 26 Feb. 2010   | K.Oguri     | Title<br>Taping repair method | Drawing No.<br><b>EEK17B-00010</b> | Rev.  |
| Checked  | 26 Feb. 2010   | K.Oguri     |                               |                                    |       |
| Approved | 26 Feb. 2010   | J. Nakamura |                               |                                    |       |

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