



SPECIFICATION

NO.

PAGE

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I. SCOPE

This specification relates to the voltage controlled crystal oscillator to be supplied by CITIZEN WATCH CO., LTD. (following as CITIZEN) .

NOTICE

1.If something that is ambiguously defined or undefined in this specification happened, the customer and CITIZEN would discuss and take necessary steps by mutual consent.

2.Product test data can't be attached to this specification.

3.This product is not authorized for use as critical component in life support devices or systems.

II. SPECIFICATION

1. ABSOLUTE MAXIMUM RATING

| Parameter                                |      | CSX750VB/CSX750VC                                                 |
|------------------------------------------|------|-------------------------------------------------------------------|
| Supply Voltage                           | Vmax | -0.5V to +7.0V                                                    |
| Storage Temperature                      | Tstg | -45°C to +90°C                                                    |
| Output Current                           | Iout | 10mA Max.                                                         |
| Input Control Voltage                    | Vc_m | -0.5V to Vdd +0.5V                                                |
| Solder Heat Resistance Of The Outer Lead | Tsol | Max.240°C x Max.10 seconds x 2times<br>Max.200°C x Max. 3 minutes |

2. OPERATING RANGE

| Parameter             |      | CSX750VB                       | CSX750VC |
|-----------------------|------|--------------------------------|----------|
| Supply Voltage        | Vdd  | 3.3V±5%                        | 5.0V±10% |
| Operating Temperature | Topr | -10°C to 70°C or -40°C to 85°C |          |
| Input Control Voltage | Vc   | 0.0V to Vdd                    |          |
| Output Load           | CL   | 30pF Max.                      |          |

3. FREQUENCY CHARACTERISTICS

| Parameter             |       | CSX750VB    | CSX750VC     |
|-----------------------|-------|-------------|--------------|
| Stability (note1)     | dF0   | ±50ppm Max. |              |
| Pullability (note2)   | Fpull | ±90ppm Min. | ±100ppm Min. |
| Linearity             | Ldev  | ±15% Max.   | ±10% Max.    |
| Modulation Band Width | Fmod  | 10kHz Min.  |              |

note1) Frequency Stability includes initial tolerance, temperature characteristics, input voltage characteristics, load characteristics, shock, vibration, reflow and 1st year aging.

note2) Vc=1.65V±1.65V (CSX750VB) Vc=2.5V±2.0V (CSX750VC)

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#### 4. ELECTRICAL CHARACTERISTICS

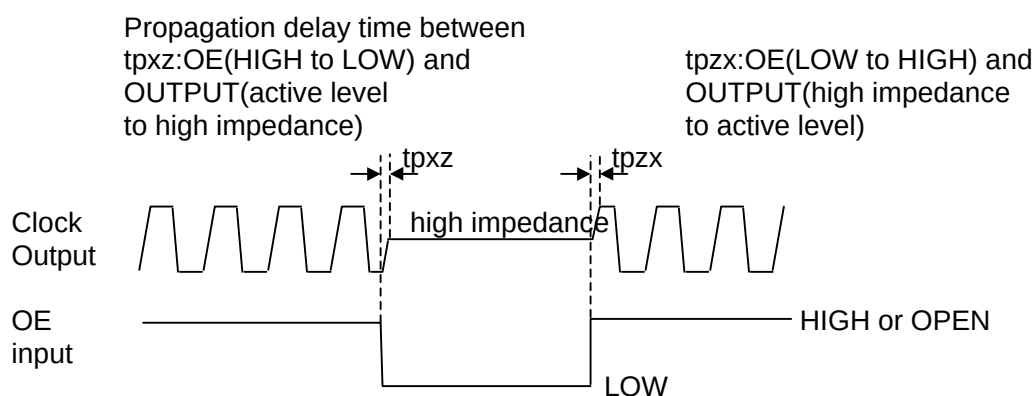
(Ta=25°C load=30pF Vc=Vdd/2)

| Parameter                        | Conditions    | CSX750VB       | CSX750VC  |
|----------------------------------|---------------|----------------|-----------|
| Start Up Time (note)      tosc   |               | 4msec Max.     |           |
| Power Supply Current      Idd    | No Load       | 11mA Max.      | 30mA Max. |
| Disable Current            Iinh  | No Load       | 5mA Max.       | 20mA Max. |
| Rise Time                    tr  | 20% to 80%Vdd | 5ns Max.       |           |
| Fall Time                    tf  | 80% to 20%Vdd | 5ns Max.       |           |
| Duty Cycle                  duty | 50%Vdd        | 45% to 55%     |           |
| Output HIGH Voltage      Voh     | Ioh = -0.8mA  | Vdd-0.4V Min.  |           |
| Output LOW Voltage      Vol      | Iol = 3.2mA   | 0.4V Max.      |           |
| OE Input HIGH Voltage    Vih     |               | Vdd x 0.7 Min. |           |
| OE Input LOW Voltage    Vil      |               | Vdd x 0.3 Max. |           |
| Output Disable Time       tpxz   | See 5.        | 100ns Max.     |           |
| Output Enable Time        tpzx   |               | 100ns Max.     |           |

note) Vc must be kept ground level or left open when starting up.

#### 5. THREE STATE OUTPUT OPERATION

| OE Input     | Clock Output   |         |
|--------------|----------------|---------|
| HIGH or OPEN | Active         | enable  |
| LOW          | High impedance | disable |



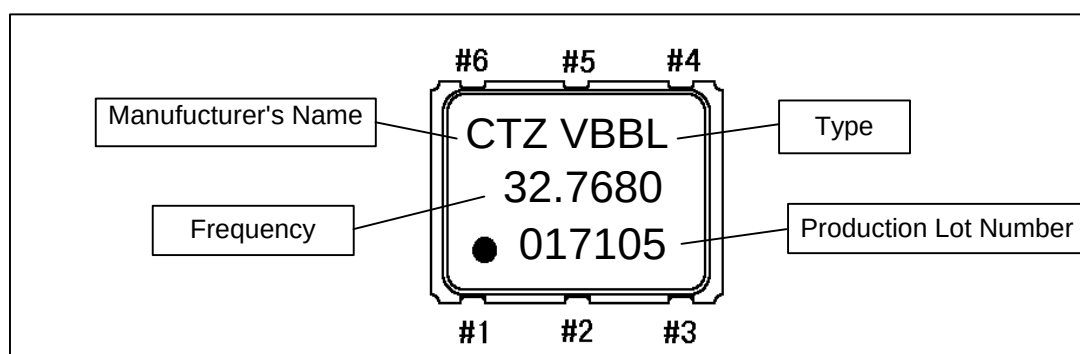
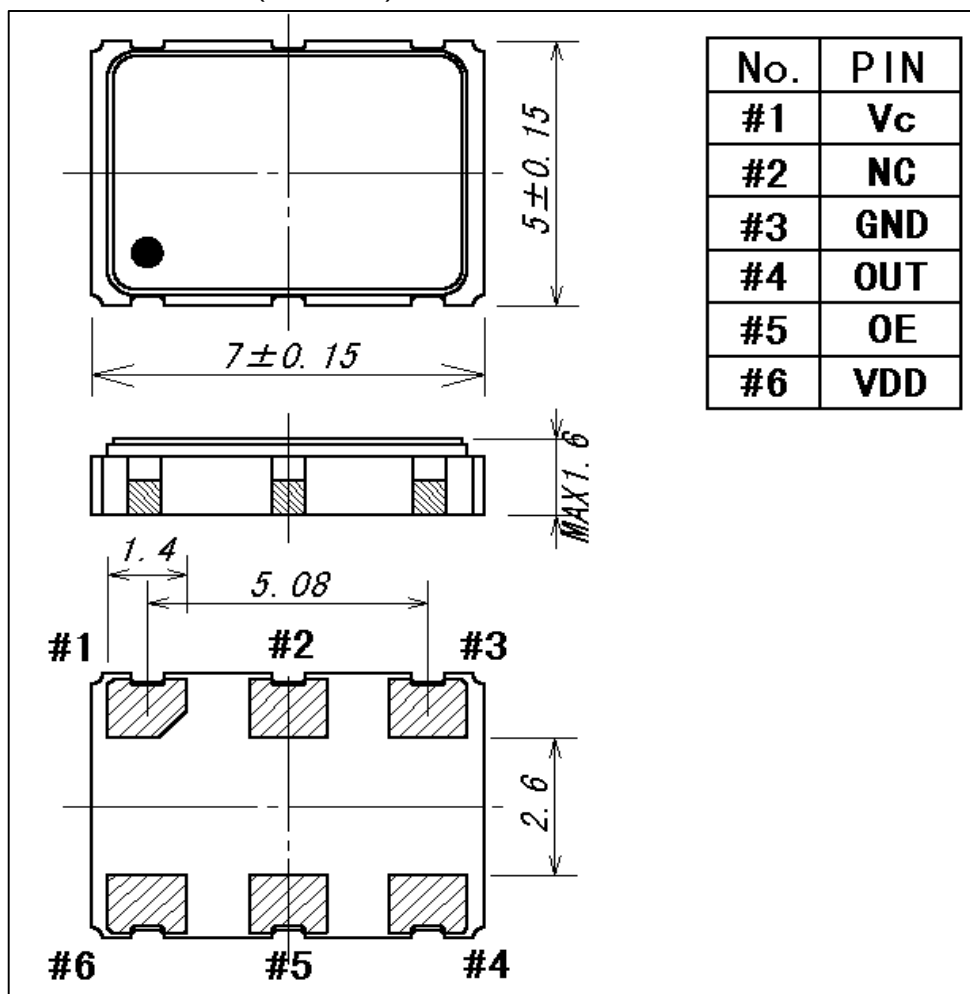
NOTE: A disable clock output does not synchronize with OE,  
because internal quartz oscillator is continuous.

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| SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | NO.<br>DATE |  | PAGE<br>4/10 |
| <div data-bbox="244 286 470 320"> <p>6. TEST CIRCUIT</p> </div> <div data-bbox="244 353 521 387"> <p>[CMOS LOAD] (30pF)</p> </div> <div data-bbox="244 387 826 757"> </div> <div data-bbox="930 353 1206 387"> <p>[SUPPLY CURRENT]</p> </div> <div data-bbox="930 387 1289 757"> </div> <div data-bbox="244 779 647 813"> <p>[MEASUREMENT CONDITION]</p> </div> <div data-bbox="323 813 1190 1137"> <ol style="list-style-type: none"> <li>1.Oscilloscope<br/>Impedance:No less than 1Mohm<br/>Capacitance:No more than 5pF<br/>Band width:No less than 500MHz<br/>The length of GND lead of the probe should be as short as possible.</li> <li>2.The CL includes the probe capacitance.</li> <li>3.Grounding should be single point grounding.</li> <li>4.Supply impedance should be as low as possible.<br/>0V to 90%Vdd rise time is no less than 150us</li> <li>5.Use the ammeter that internal impedance is small.</li> </ol> </div> <div data-bbox="196 1261 520 1294"> <p>7. OUTPUT WAVEFORM</p> </div> <div data-bbox="244 1328 520 1361"> <p>[CMOS LOAD] (30pF)</p> </div> <div data-bbox="228 1451 917 1854"> <p style="text-align: center;">DUTY=Th/T</p> </div> |             |  |              |

|                                                                                                                                                                                                                                                                                                                                                       |                                                   |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |
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|                                                                                                                                                                                                                                                                                                                                                       | DATE                                              |  | 5/10 |      |            |       |                      |           |                      |            |                                              |           |                                                   |
| <p>8. ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS</p> <p>The following are our reliability test conditions.</p>                                                                                                                                                                                                                                      |                                                   |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |
| <table border="1"><tr><td>Item</td><td>Conditions</td></tr><tr><td>Shock</td><td>MIL-STD-883E 2002.3B</td></tr><tr><td>Vibration</td><td>MIL-STD-883E 2007.2A</td></tr><tr><td>Gross Leak</td><td>Leak rate less than 50ppm atm cc /sec of Air</td></tr><tr><td>Fine Leak</td><td>Leak rate less than 0.01ppm atm cc /sec of Herium</td></tr></table> |                                                   |  |      | Item | Conditions | Shock | MIL-STD-883E 2002.3B | Vibration | MIL-STD-883E 2007.2A | Gross Leak | Leak rate less than 50ppm atm cc /sec of Air | Fine Leak | Leak rate less than 0.01ppm atm cc /sec of Herium |
| Item                                                                                                                                                                                                                                                                                                                                                  | Conditions                                        |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |
| Shock                                                                                                                                                                                                                                                                                                                                                 | MIL-STD-883E 2002.3B                              |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |
| Vibration                                                                                                                                                                                                                                                                                                                                             | MIL-STD-883E 2007.2A                              |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |
| Gross Leak                                                                                                                                                                                                                                                                                                                                            | Leak rate less than 50ppm atm cc /sec of Air      |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |
| Fine Leak                                                                                                                                                                                                                                                                                                                                             | Leak rate less than 0.01ppm atm cc /sec of Herium |  |      |      |            |       |                      |           |                      |            |                                              |           |                                                   |

## III. DIMENSIONS AND MARKING

&lt;&lt;Dimensions&gt;&gt; (UNIT mm)



## IV. TAPE AND REEL PACKAGING

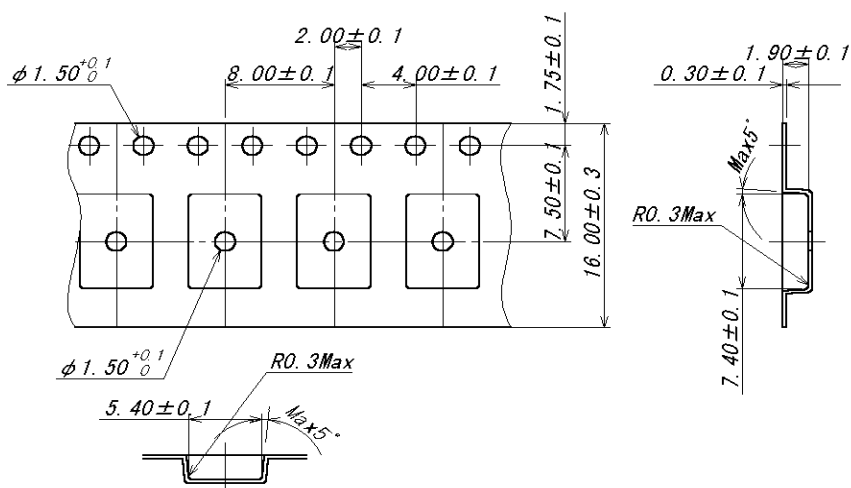
## 1. TAPING SPECIFICATION

Subject to EIA 481A &amp; JIS C 0806

## (1) Tape Dimensions

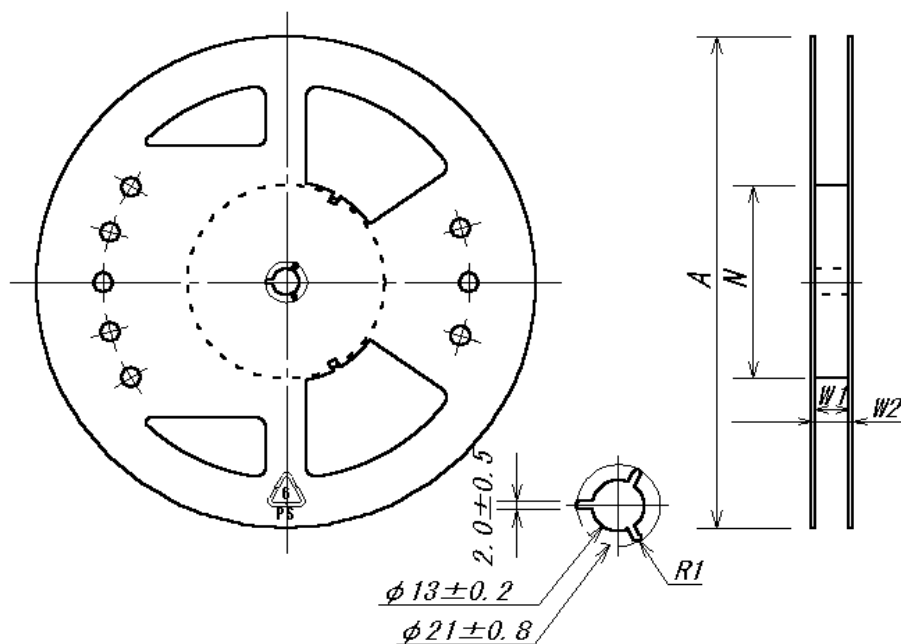
Material of the Carrier Tape : PA-PET conductive coat

Material of the Cover Tape : PE A-PET conductive coat



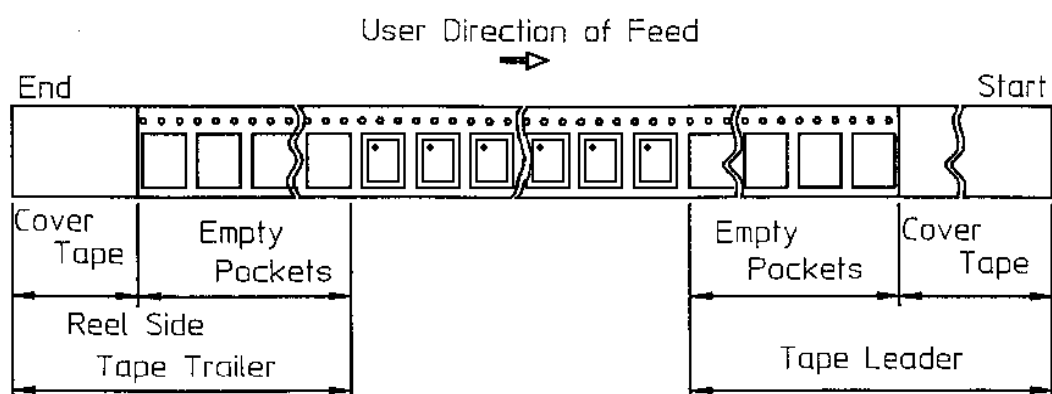
## (2) Reel Dimensions

Material of the Reel : PS



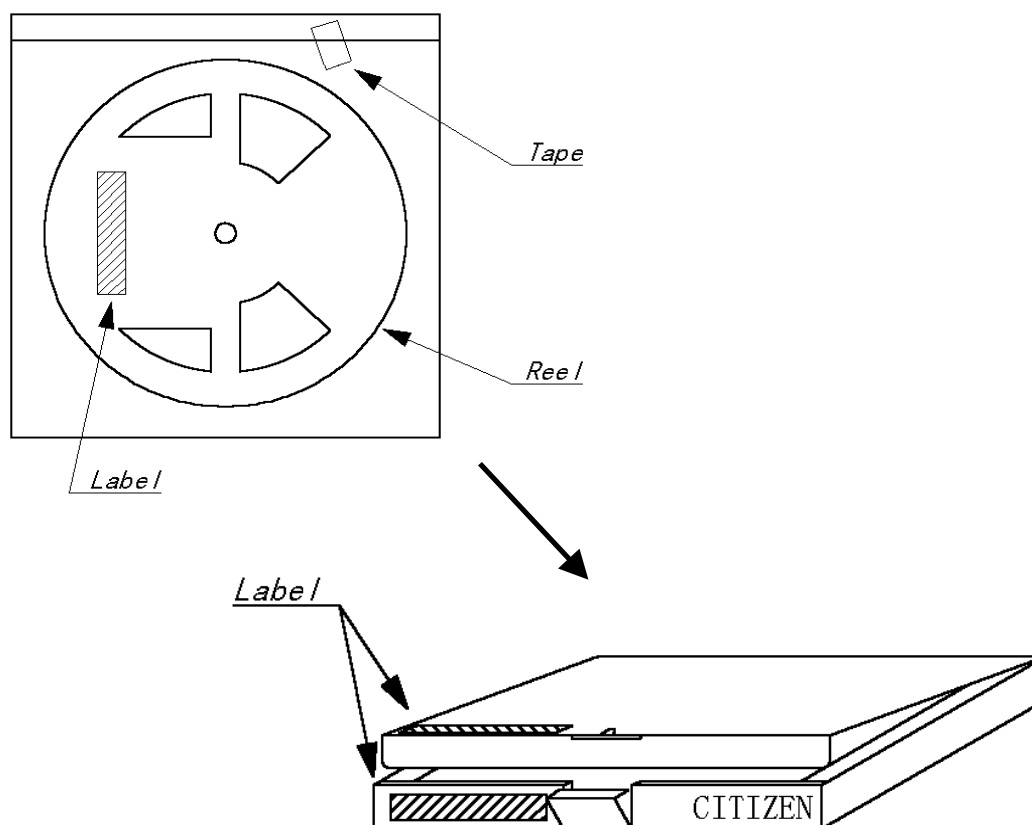
| Symbol        | A           | N           | W1             | W2             |
|---------------|-------------|-------------|----------------|----------------|
| Dimension(mm) | 254 $\pm$ 2 | 100 $\pm$ 1 | 17.5 $\pm$ 1.0 | 21.5 $\pm$ 1.0 |

## (3) Packing



| Item         |               | Empty Space     |
|--------------|---------------|-----------------|
| Tape Leader  | Cover Tape    | Min. 500 mm     |
|              | Empty Pockets | Min. 20 Pockets |
| Tape Trailer | Cover Tape    | Min. 0 mm       |
|              | Empty Pockets | Min. 40 mm      |

## 2. INNER CARTON





|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |  |              |
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| SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | NO.<br>DATE |  | PAGE<br>9/10 |
| <div data-bbox="245 286 501 320" data-label="Section-Header"> <h3>3. OUTER CARTON</h3> </div> <div data-bbox="453 331 1027 904" data-label="Image"> </div> <div data-bbox="245 969 405 1003" data-label="Section-Header"> <h3>4. MARKING</h3> </div> <div data-bbox="277 1003 1123 1294" data-label="List-Group"> <p>(1) Marking Labels are affixed to reel , inner carton and outer carton.<br/>     Reel Marking is consist of:</p> <p>(2) Each label contains the following information.</p> <ul style="list-style-type: none"> <li>* Parts name or type</li> <li>* Frequency</li> <li>* Quantity</li> <li>* Manufacturing Date or symbol</li> <li>* Manufacturer's name or symbol</li> <li>* Others(if necessary)</li> </ul> </div> <div data-bbox="245 1328 421 1361" data-label="Section-Header"> <h3>5. QUANTITY</h3> </div> <div data-bbox="325 1395 501 1429" data-label="Text"> <p>2000 pcs/reel</p> </div> <div data-bbox="245 1462 628 1496" data-label="Section-Header"> <h3>6. STORAGE ENVIRONMENT</h3> </div> <div data-bbox="277 1496 1283 1653" data-label="List-Group"> <ul style="list-style-type: none"> <li>* Storage the reel at normal temperature and humidity</li> <li>* Open the packing just before using.</li> <li>* Do not expose the sun.</li> <li>* Do not storage with some erosive chemicals.</li> <li>* Nothing is allowed to put on the reel or carton to prevent mechanical damage.</li> </ul> </div> <div data-bbox="245 1653 421 1686" data-label="Section-Header"> <h3>7. HANDLING</h3> </div> <div data-bbox="277 1686 1139 1720" data-label="List-Group"> <ul style="list-style-type: none"> <li>* Handle with care to prevent the damage of tape, reel and products.</li> </ul> </div> |             |  |              |

| SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | NO.  |  | PAGE  |
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| <p>V. NOTES</p> <p>1. HANDLING</p> <p>(ELECTROSTATIC DISCHARGES)</p> <p>This device is made with CMOS circuitry. Please take precautions to prevent damage due to electrical static discharge.</p> <p>(SHOCK RELIABILITY)</p> <p>This device contains a quartz crystal, so please do not give too much shock or vibration. An automatic inserion is available, however, the internal quartz crystal might be damaged in case that too much shock or vibration is given by machine condition. Be sure to check your machine condition in advance.</p> <p>(CLEANING)</p> <p>Since, depending on the cleaning conditions, there is a possibility of damage being caused to the Crystal Osillator, do not fail to test and confirm the results beforehand, using your company's cleaning conditions.</p> <p>(TEMPERATURE AND HUMIDITY)</p> <p>We recomend to store and use device under normal temperature and humidity. When this device is used in high humidity applications, there is a potential problem with condensation. As with other IC's, please take precautions to prevent condensation.</p> <p>2. CIRCUIT DESIGNS</p> <p>(POWER LINES)</p> <p>We recomend placing a 0.01 to 0.1uF capacitor between VDD and GND to obtain stable operation and protect against power line ripple . VDD and GND pattern should be as wide as possible.</p> <p>(OE INPUT LINE)</p> <p>When OE pin is not used, please connect it to VDD.</p> <p>(OUTPUT LINE)</p> <p>As a long output line may cause irregular output, please take care to design that output line is as short as possible, and also keep high level signal source away from this device.</p> <p>(STARTING UP)</p> <p>Vc must be kept ground level or left open when starting up.</p> |      |  |       |