

**EW 深圳市炬炬科技有限公司**  
**CHIP SUN TECHNOLOGY CO., LTD**

**APPROVAL  
SHEET**



**CUSTOMER:** \_\_\_\_\_  
**DESCRIPTION:** SMD2520 32.368KHz Quartz Crystal Oscillator  
**MANUFACTURER PART NO.:** FXO32.768K1.8SM2-30DEW  
**CUSTOMER PART NO.:** \_\_\_\_\_  
**USED IN MODEL :** \_\_\_\_\_  
**REVISION** A1

| 承 认 <b>APPROVAL</b>     |                      |                         |
|-------------------------|----------------------|-------------------------|
| 工程部<br>TECHNOLOGY DEPT. | 品质部<br>QUALITY DEPT. | 采购部<br>PURCHASING DEPT. |
|                         |                      |                         |

**Date:** March 15, 2023



**深圳市炬炬科技有限公司**

CHIP SUN TECHNOLOGY CO., LTD

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| <u>Rev</u> | <u>Revise page</u> | <u>Revise contents</u> | <u>Date</u> | <u>Ref.No.</u> | <u>Reviser</u> |
|------------|--------------------|------------------------|-------------|----------------|----------------|
| A1         | ALL                | Initial released       | 2023.03.15  | N/A            | DavidJiang     |
|            |                    |                        |             |                |                |
|            |                    |                        |             |                |                |
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# 1. QUARTZ CRYSTAL OSCILLATOR SPECIFICATION

|                                 |  |
|---------------------------------|--|
| 1.1 Frequency:                  | 32.768KHz  |
| 1.2 Holder type :               | SMD2520  |
|                                 | ±30ppm Overall   |
| 1.3 Frequency stability:        | Temperature stability is Inclusive of all conditions:<br>Calibration Tolerance at +25°C,<br>frequency stability over the operating temperature range,<br>supply voltage change, output load changes,<br>shock, vibration, and 1st year aging at +25°C. |
| 1.4 Supply voltage:             | 1.8V <sub>DC</sub> ±10%  |
| 1.5 Input Current :             | 1.0mA max ((at 15pF Load)  |
| 1.6 Operable temperature range: | -40°C To +85°C   |
| 1.7 Storage temperature range:  | -55°C To +125°C  |
| 1.8 Symmetry :                  | 45~55% (at 50% VDC)  |
| 1.9 Rise& Fall Time:            | 50nS max   |
| 1.10 Output Load:               | HCMOS 15pF Typical   |
| 1.11 Output Low Level:          | 10%V <sub>DD</sub> max   |
| 1.12 Output High level:         | 90%V <sub>DD</sub> min   |
| 1.13 Output Wave form:          | Square   |
| 1.14 Pin 1 Connection:          | Tri-State  |
| 1.15 Start-up time:             | 5mS max  |
| 1.16 Aging:                     | Less than ±3 ppm/Year  |
| 1.17 Insulation resistance:     | 500M Ω (DC100±10V)min  |
| 1.18 Output Waveform            | Refer to fig.1   |
| 1.19 Test circuit               | Refer to fig.2   |
| 1.20 Dimensions and marking     | Refer to page.3  |
| 1.21 Emboss carrier tape & reel | Refer to page.5 and page.6   |

## Standard atmospheric conditions

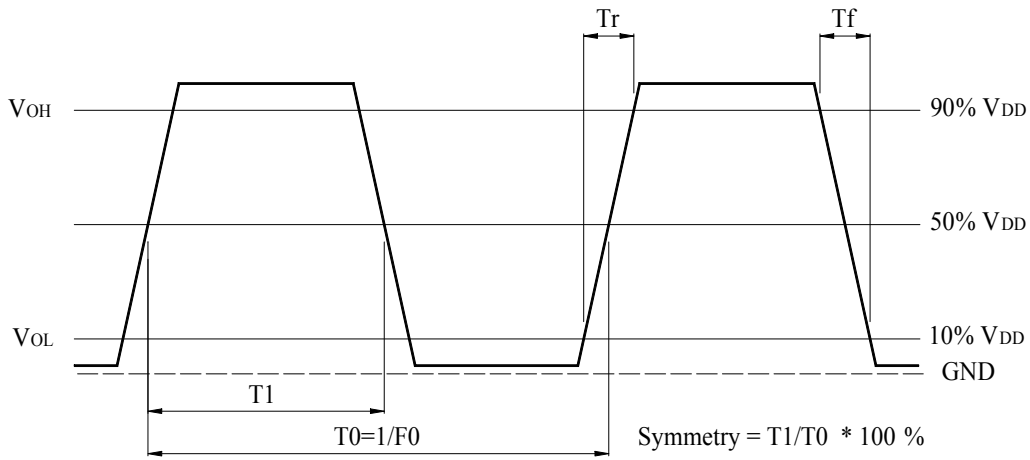
Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25±3°C

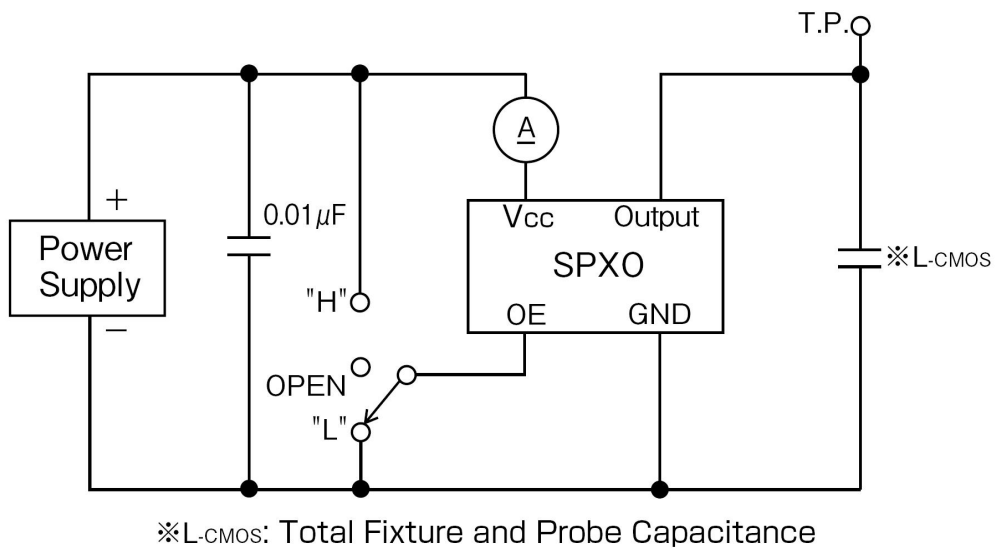
Relative humidity : 40%~70%

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## 2. Output Waveform



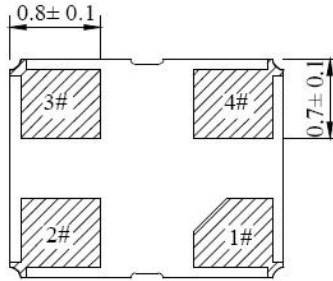
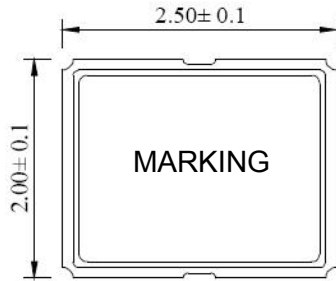
## 3. Test circuit



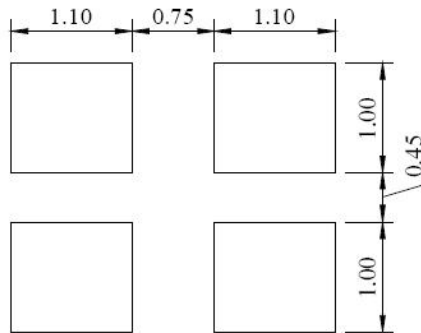
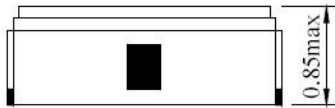
### CHIP SUN TECHNOLOGY CO., LTD.

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## 4. FXO221S MARKING & DIMENSIONS



| Pin | Connection       |
|-----|------------------|
| 1   | E/D              |
| 2   | GND              |
| 3   | Output           |
| 4   | +V <sub>DD</sub> |



Recommended land Pattern

### Reference drawing

|                             |  |
|-----------------------------|--|
| Base:                       | Alumina Ceramic (Al <sub>2</sub> O <sub>3</sub> )<br>Metallized Pad: W<br>Ni Plating<br>Au Plating |
| Cap:                        | Fe-Ni  |
| (3) Crystal Enclosure Seal: | Seal Seam  |
| (4) Crystal Blank           | Rectangular At-Cut Quartz Crystal Blank  |
| (5) Adhesive                | Silver Conductive Polyimide Resin  |
| (6) Electrode               | Ag   |
| (7) PAD                     | Alumina Ceramic (W. Ni. Au)  |

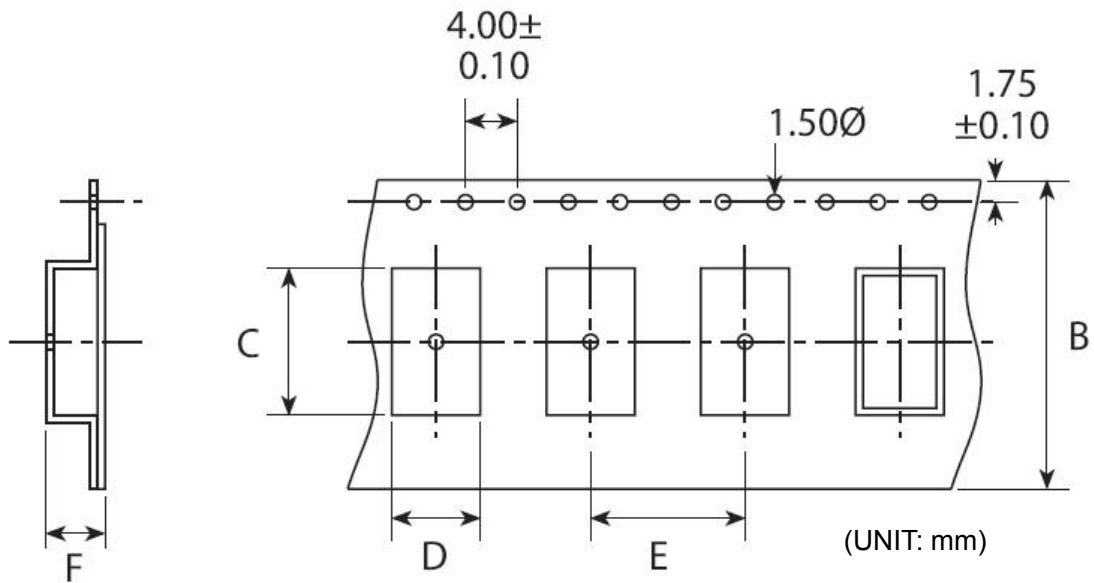
The use prohibition chemistry substance of Table 1 of DHE-0204-1 (QA-QM-08) is not included in this item.

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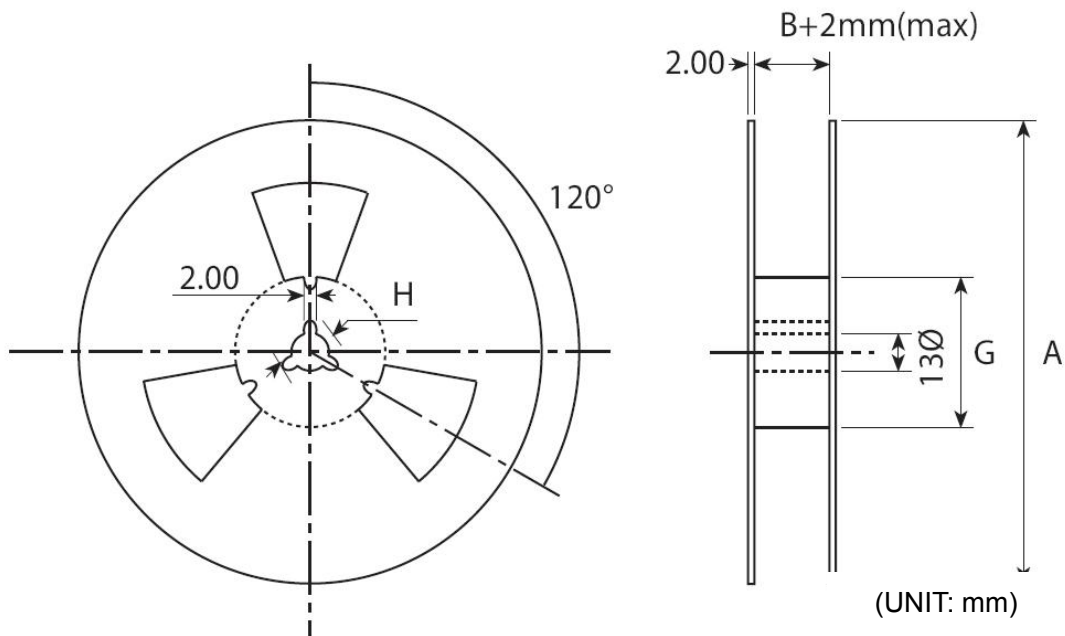
## 5. FX0321S EMBOSS CARRIER TAPE & REEL

### a.) Dimensions of Carrier Tape



|             | A       | B       | C         | D         | E       | F       | G        |
|-------------|---------|---------|-----------|-----------|---------|---------|----------|
| OSC-SMD2520 | 180±2.0 | 8.0±0.3 | 2.80±0.10 | 2.30±0.10 | 4.0±0.1 | 1.1±0.1 | 60.5±1.0 |

### b.) Dimensions of Reel



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c.) Storage condition

Temperature: +40deg.C Max.

Relative Humidity: 80% Max.

d.) Standard packing quantity

3,000PCS / REEL

e.) Material of the tape

| Tape         | Material  |
|--------------|-----------|
| Carrier tape | A – PET   |
| Top tape     | Polyester |

f.) Label contents

.The type of product

.Our specification No.

.Your Part No.

.Lot No.

.Nominal Frequency

.Quantity

.Our Company Name

Sticks label for every reel.

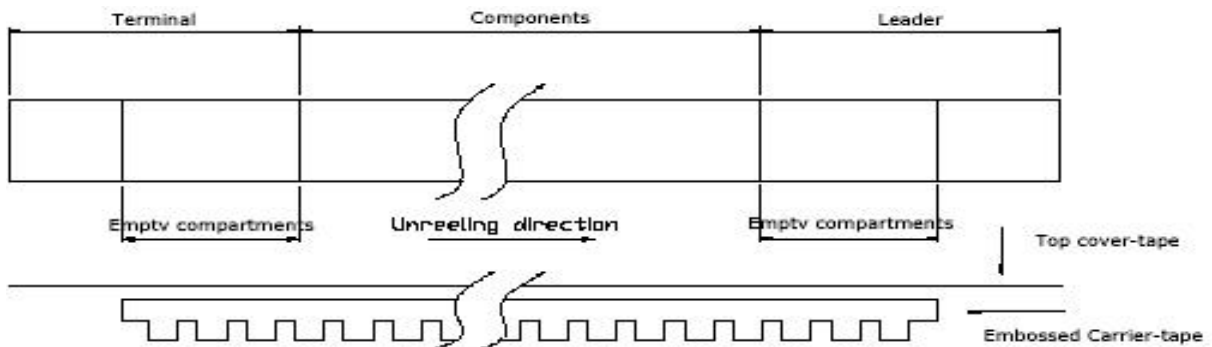
|                                      |  |
|--------------------------------------|--|
|                                      |  |
| PART NUMBER                          |  |
| Lot. NO:                             |  |
| HOLDER TYPE                          |  |
| FREQUENCY                            |  |
| REMAKS                               |  |
| QUANTITY                             |  |
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g.) Taping dimension

|          |              |   |
|----------|--------------|---|
| Leader   | Cover-tape   | The length of cover-tape in the leader is more than 400 mm including empty embossed area.   |
|          | Carrier-tape | After all products were packaged, must remain more than twenty pieces or 400 mm empty area, which should be sealed by cover-tape. |
| Terminal | Cover-tape   | The tip of cover-tape shall be fixed temporary by paper tape and roll around the core of reel one round.                          |
|          | Carrier-tape | The empty embossed area which are sealed by top cover-tape must remain more the 40 mm.  |



h.) Joint of tape

The carrier-tape and top cover-tape should not be jointed.

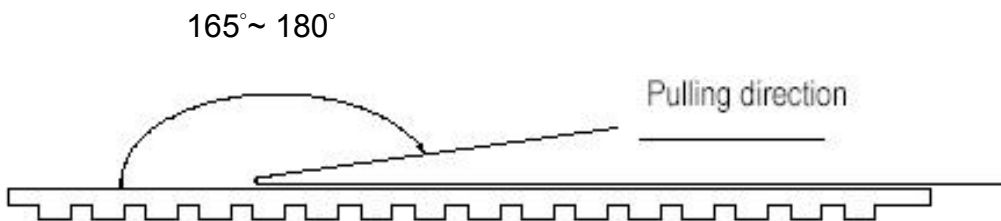
i.) Release strength of cover tape

It has to between 0.1N to 0.7N under following condition.

Pulling direction 165° to 180°

Speed 300mm/min.

Otherwise unless specified.



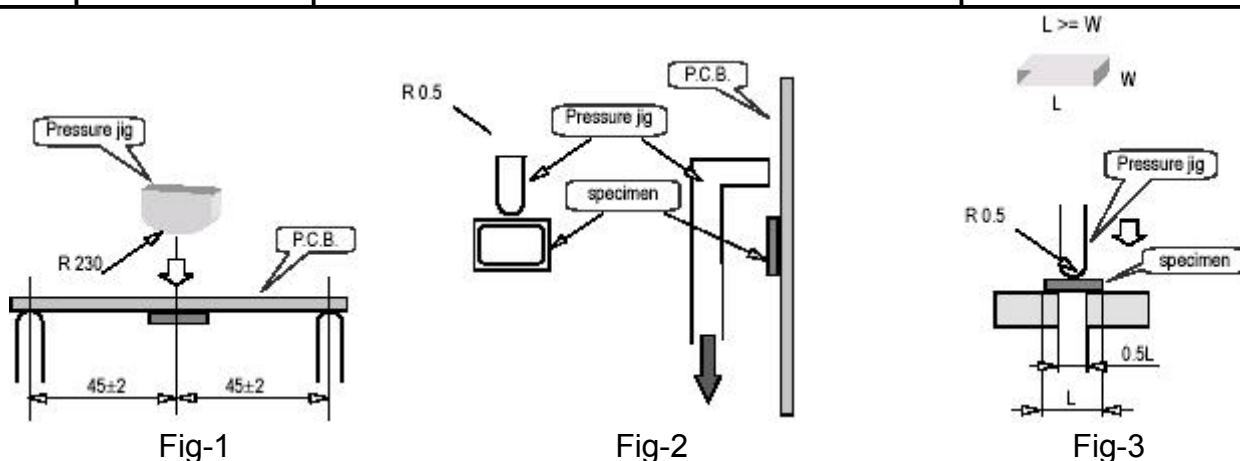
Other standards shall be based on JIS C 0806-1990.

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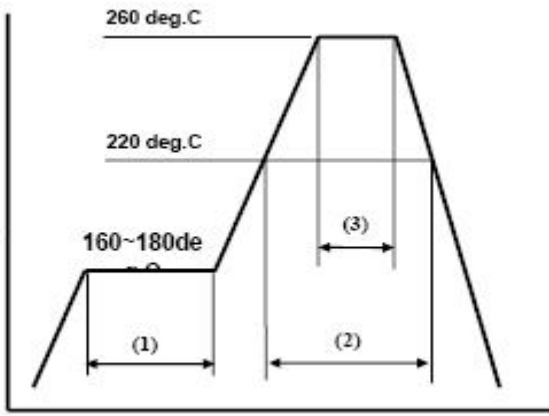
6. Mechanical Endurance: Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.

|     | Item              | Conditions   | Specifications                              |
|-----|-------------------|--|---|
| 6.1 | Drop              | Should be satisfied after dropping three times from the height of 100 cm onto hard wooden board of thickness more than 30mm.   | The parameters of table 3 must be satisfied |
| 6.2 | Vibration         | Should be satisfied after supplying following<br>(1)Vibration Frequency: 10~55Hz<br>(2)Cycle: 1 to 2 Min.<br>(3)Full Cycle: 0.8mm P-P.<br>(4)Direction: X.Y.Z<br>(5)Time: 2 Hours / Each Direction | The parameters of table 3 must be satisfied |
| 6.3 | Substrate Bending | Mount the specimen on substrate.<br>Apply the following pressure<br>Direction: see Fig -1<br>Speed: 0.5 mm/sec<br>Hours: 5 ± 1 sec<br>Amount of substrate: 3 mm Max.                               | The parameters of table 3 must be satisfied |
| 6.4 | Adhesion          | Mount the specimen on substrate.<br>Apply the following pressure<br>Direction: see Fig -2<br>Weight: 10N<br>Hours: 10 ± 1 sec  | The parameters of table 3 must be satisfied |
| 6.5 | Body strength     | Mount the specimen on substrate.<br>Apply the following pressure<br>Direction: see Fig -3<br>Weight: 10N<br>Hours: 10 ± 1 sec  | The parameters of table 3 must be satisfied |



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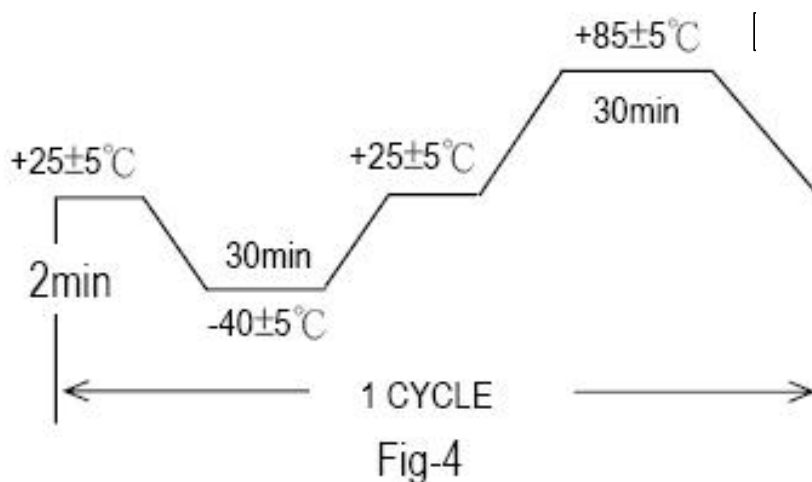
|     |                              |  |   |     |         |               |         |     |              |           |        |     |      |           |             |
|-----|------------------------------|--|---|-----|---------|---------------|---------|-----|--------------|-----------|--------|-----|------|-----------|-------------|
| 6.6 | Seal                         | Less than $2.0 \times 10^{-9}$ Pa.m <sup>3</sup> /sec by Helium leak detector.<br>Also, no serial bubble is observed by Fluorinate tests.  |   |     |         |               |         |     |              |           |        |     |      |           |             |
| 6.7 | Solder ability               | 3 sec Dip in 235°C±5°C solder.<br>(Use ROSIN type flux for solder.)  | More than 90% of lead shall be covered by new solder. |     |         |               |         |     |              |           |        |     |      |           |             |
| 6.8 | Resistance to Soldering Heat | <p>Run in Reflow<br/>Reflow soldering shall be allowed<br/>Only two(2) time.</p> <p style="text-align: center;"><b>Available for Lead Free Soldering</b></p>  <table border="1" data-bbox="518 1209 1069 1332"> <tr> <td>(1)</td> <td>Preheat</td> <td>160~180 deg.C</td> <td>120sec.</td> </tr> <tr> <td>(2)</td> <td>Primary heat</td> <td>220 deg.C</td> <td>60sec.</td> </tr> <tr> <td>(3)</td> <td>Peak</td> <td>260 deg.C</td> <td>10sec. Max.</td> </tr> </table> <p>The parameters of table 3 must be satisfied</p> |   | (1) | Preheat | 160~180 deg.C | 120sec. | (2) | Primary heat | 220 deg.C | 60sec. | (3) | Peak | 260 deg.C | 10sec. Max. |
| (1) | Preheat                      | 160~180 deg.C  | 120sec.   |     |         |               |         |     |              |           |        |     |      |           |             |
| (2) | Primary heat                 | 220 deg.C  | 60sec.  |     |         |               |         |     |              |           |        |     |      |           |             |
| (3) | Peak                         | 260 deg.C  | 10sec. Max.   |     |         |               |         |     |              |           |        |     |      |           |             |

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7. Environmental Endurance: Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.

|     | Item                        | Conditions  | Specifications  |
|-----|-----------------------------|---|---|
| 7.1 | Humidity                    | Should be satisfied after letting it alone at $+60^{\circ}\text{C}\pm 2^{\circ}\text{C}$ in humidity of 90%~95% for 500 hours.  | The parameters of table 1 must be satisfied.<br>No physical damage. |
| 7.2 | Storage in Low Temperature  | Should be satisfied after letting it alone at $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 500 hours.   | The parameters of table 1 must be satisfied.<br>No physical damage. |
| 7.3 | Storage in High Temperature | Should be satisfied after letting it alone at $+85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 500 hours.   | The parameters of table 1 must be satisfied.<br>No physical damage. |
| 7.4 | Temperature Cycle           | Should be satisfied after supplying the following temperature cycle ( 100 cycles). (Refer to Fig-4).<br>Temperature shift from low to high, high to low shall be done in $1^{\circ}\text{C}/\text{min}$ . | The parameters of table 1 must be satisfied.<br>No physical damage. |



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