

CRYSTAL SPECIFICATION

Customer : _____
Customer P/N : _____
Agent : _____
Agent Code : _____
Order Code : _____
SIWARD P/N : XTL571100 - M118-017

Customer Approval :

希華晶體科技股份有限公司
SIWARD CRYSTAL TECHNOLOGY CO., LTD.

業務部/ SALE DEPARTMENT

TEL: (04)25347909

FAX: (04)25327885/25337396

URL HTTP://www.siward.com.tw

DATE : 2007/06/06

Approved By : _____

Steve

品質保證部/ QUALITY ASSURANCE DEPT.

TEL: (04)25347909 EXT 1340/1341

Checked By : _____

Tom

研發部/R & D DEPT.

TEL: (04)25347909 EXT 1533

Designer : _____

Sally

| Rev. | Description of Revision History | Date | Designer | Checked By |
|------|---------------------------------|------------|----------|------------|
| 1 | New Publication | 2006/10/13 | Sally | Tom |

CRYSTAL SPECIFICATION

1. Description : Quartz Crystal
 2. Nominal Frequency : 32.000000 MHz
 3. Center Frequency : 32.000000 MHz
 4. Dimension & Drawing No. : SX-3225 ; SXD-00213
 5. Oscillation Mode : Fundamental
 6. Cutting Mode : AT cut
 7. Packing Style : TP-094
 8. Measurement Instrument : 250B(Measured FL)
 9. Electrical Characteristics :
- [1] Operating Conditions :

| Item | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|-----------------------------|--------|------|------|------|------|-----------|
| Operating Temperature Range | Topt | -20 | | 75 | | |
| Storage Temperature Range | Tstg | -40 | | 90 | | |
| Load Capacitance | CL | 11.8 | 12 | 12.2 | pF | |
| Drive Level | DL | | | 100 | μW | |

[2] Frequency Stability :

| Item | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|----------------------------|--------|------|------|------|------|---------------------------------|
| Tolerance | dF/Fo | -10 | | 10 | ppm | Refer to Center Frequency @25±3 |
| Stability Over Temperature | dF/F25 | -10 | | 10 | ppm | Refer to Operating Temperature |
| Aging | dF/F25 | -2 | | 2 | ppm | Per Year |

dF/Fo: Frequency Deviation Refer to Center Frequency

dF/F25: Frequency Deviation Refer to 25 Frequency

[3] Electrical Performance :

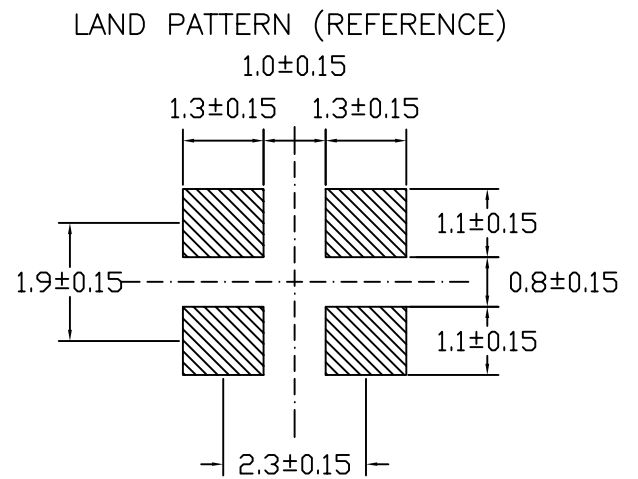
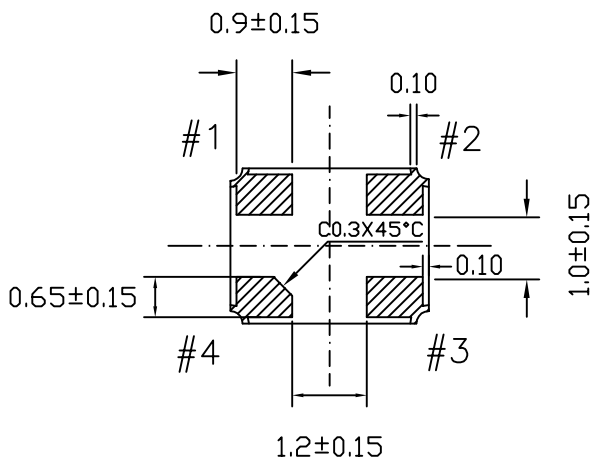
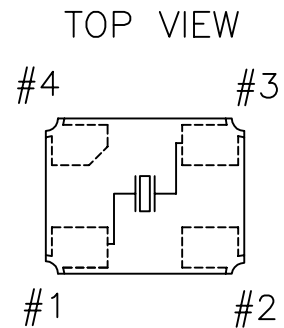
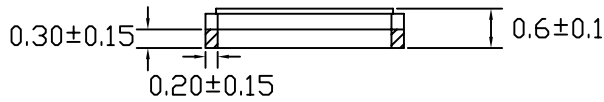
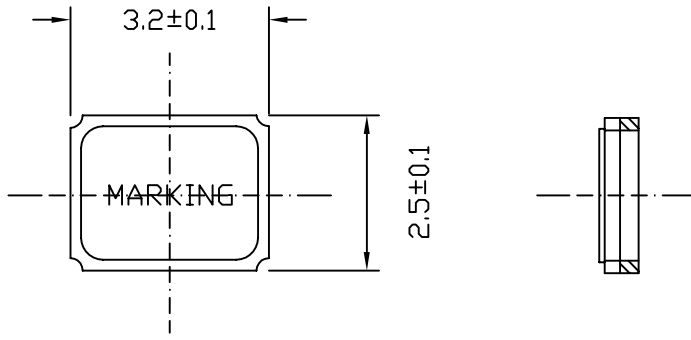
| Item | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|------------------------------|--------|------|------|------|------|--------------|
| Equivalent Series Resistance | ESR | | | 60 | Ω | @Series |
| Shunt Capacitance | Co | | | 5 | pF | |
| Insulation Resistance | IR | 500 | | | MΩ | @DC 100 Volt |

10. Marking : Laser

| | |
|--|--|
| <p>*MARKING : D ->YEAR C -> MONTH YEAR : 1 2 3 4 5 6 7 8 9 0 CODE : A B C D E F G H J K MONTH: 1 2 3 4 5 6 7 8 9 10 11 12 CODE : A B C D E F G H J K L M</p> | <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center;">32.0</p> <p style="text-align: center;">S DC</p> </div> |
|--|--|

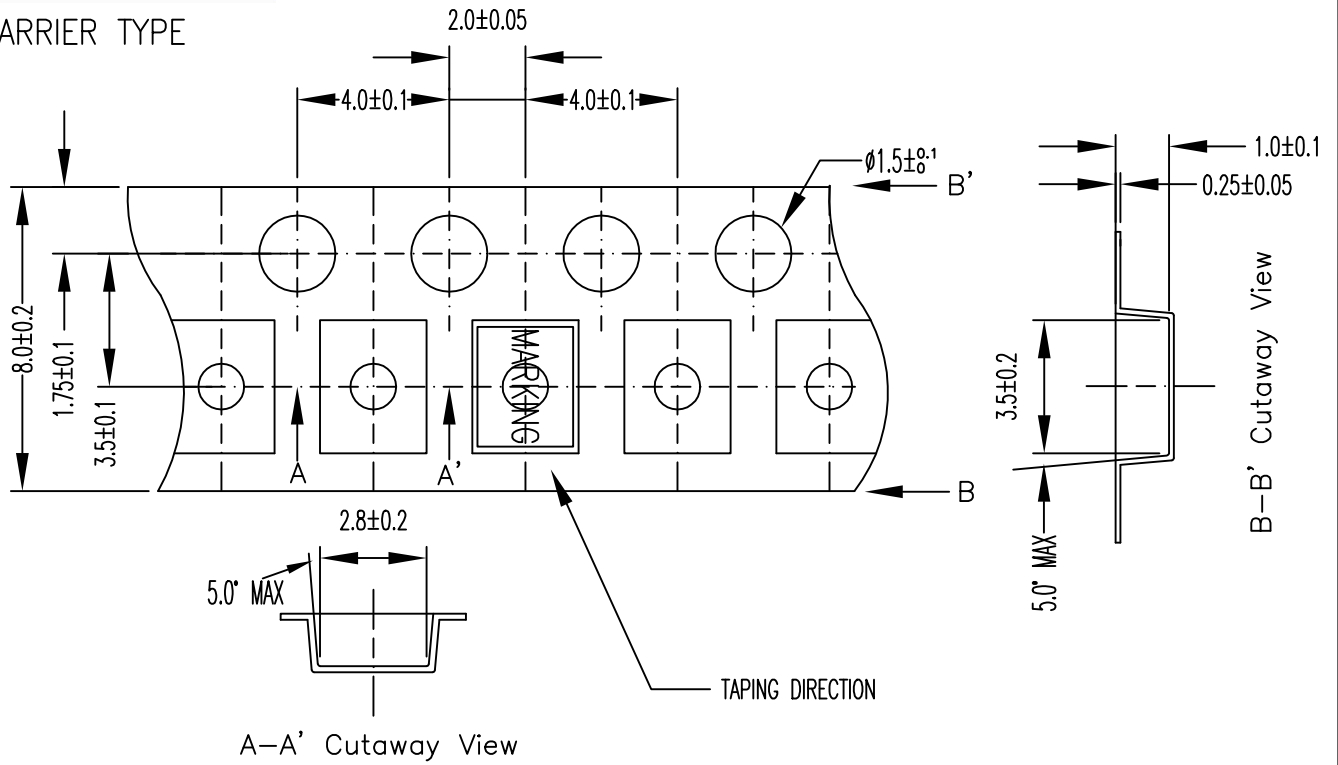
11. Remark :

| |
|------------------------------------|
| <p>* Lead Free, RoHS compliant</p> |
|------------------------------------|

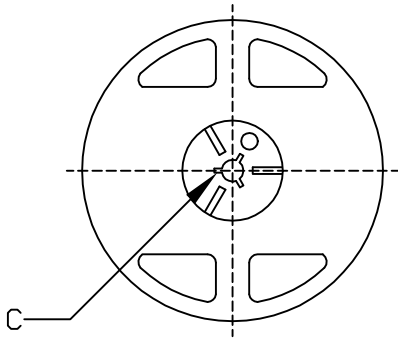


| | | | | | | |
|-----|-----------------|----------|--------------|-----------------|----------|-------------|
| | | | DRAWING NAME | SX-3225 (XTL57) | | |
| 2 | ADD MARKING | 05.09.28 | DRAWING NO. | SXD-00213 | | |
| 1 | NEW EDITION | 04.03.26 | SCALE | | UNIT | mm |
| NO. | MODIFY CONTENTS | DATE | APPROVE | <i>Casta</i> | DESIGNER | <i>Jane</i> |

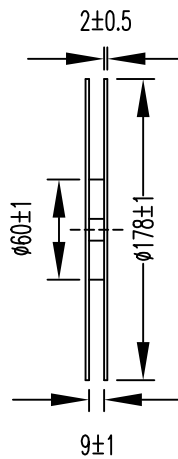
1. CARRIER TYPE



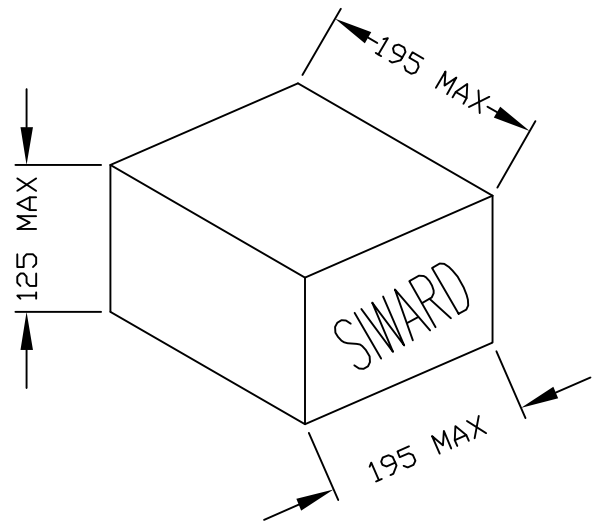
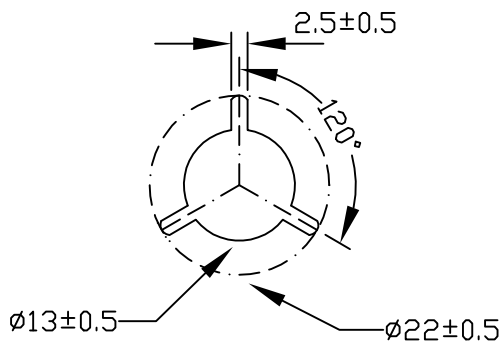
2. REEL : 3000PCS OR 1000PCS



C. ENLARGE

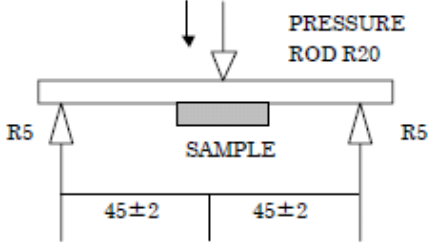
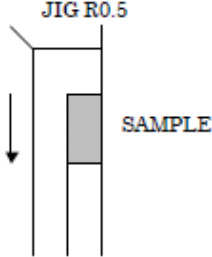
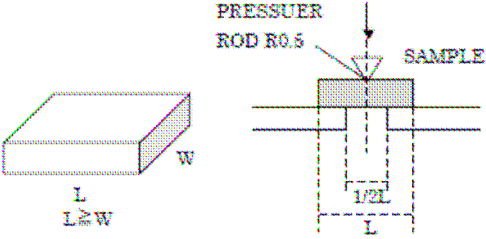


3. BOX : 6 REELS MAX

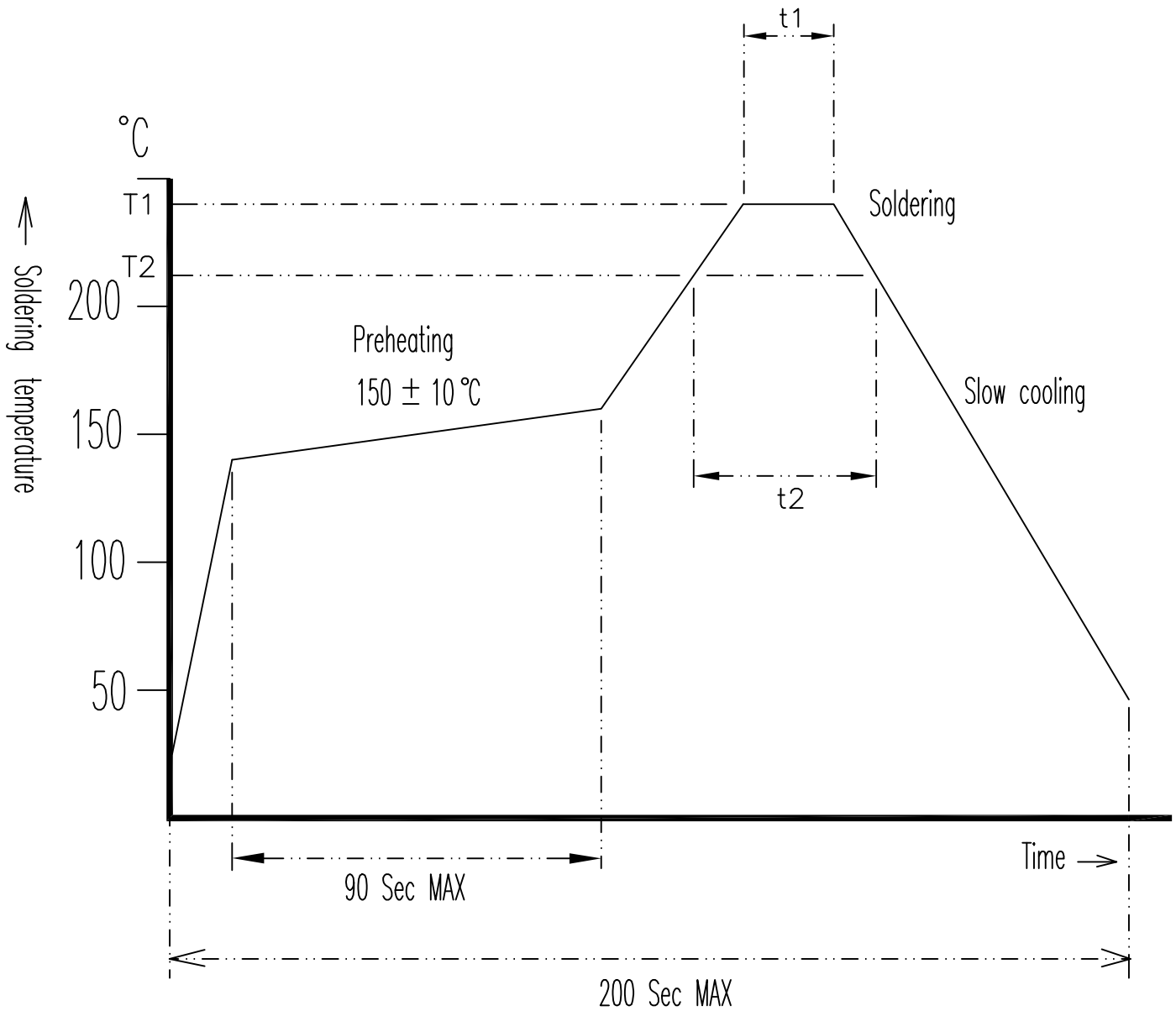


| | | | | | | |
|-----|-----------------------|-----------|--------------|-------------------|----------|--------------|
| | | | DRAWING NAME | 3225 REEL PACKING | | |
| 2 | MODIFY (101A0408-005) | '04.08.06 | DRAWING NO. | TP-094 | | |
| 1 | NEW EDITION | '03.06.23 | SCALE | | UNIT | mm |
| NO. | MODIFY CONTENTS | DATE | APPROVE | <i>Steve</i> | DESIGNER | <i>Jammy</i> |

| X'TAL | RELIABILITY SPECIFICATION | | | | | | | | | | | |
|---------------------------------|---|--|----------|---------------|--------------|-------------|-------------|--------------|---------------|-------------|-------------|---|
| REFER TO | JIS C 6701 | | | | | | | | | | | |
| APPLICATION | SMD TYPE | | | | | | | | | | | |
| ENVIRONMENTAL PERFORMANCE | | | | | | | | | | | | |
| ITEM | CONDITION | SPECIFICATIONS | | | | | | | | | | |
| 1. DRY HEAT(AGING) | STORED AT 85±2°C FOR 720±12H. THEN 25±2°C OVER 2H BEFORE TESTING. | A | | | | | | | | | | |
| 2. COLD | STORED AT -40±2°C FOR 500±12H. THEN 25±2°C OVER 2H BEFORE TESTING. | A | | | | | | | | | | |
| 3. DAMP HEAT | STORED AT 60±2°C AND HUMIDITY 90~95% FOR 500±12 H. THEN 25±2°C OVER 2H BEFORE TESTING. | A,B | | | | | | | | | | |
| 4. TEMPERATURE CYCLE | <p>THE CRYSTAL FILTER UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES, THEN 25 ±2C OVER 2 H BEFORE TESTING, EACH CYCLE AS BELLOW :</p> <table border="1" data-bbox="347 920 1110 1128"> <thead> <tr> <th>TEMPERATURE</th> <th>DURATION</th> </tr> </thead> <tbody> <tr> <td>1. -40+0/-6°C</td> <td>30±3 MINUTES</td> </tr> <tr> <td>2. 25°C±2°C</td> <td>2~3 MINUTES</td> </tr> <tr> <td>3. 85+4/-0°C</td> <td>30 ±3 MINUTES</td> </tr> <tr> <td>4. 25°C±2°C</td> <td>2~3 MINUTES</td> </tr> </tbody> </table> | TEMPERATURE | DURATION | 1. -40+0/-6°C | 30±3 MINUTES | 2. 25°C±2°C | 2~3 MINUTES | 3. 85+4/-0°C | 30 ±3 MINUTES | 4. 25°C±2°C | 2~3 MINUTES | A |
| TEMPERATURE | DURATION | | | | | | | | | | | |
| 1. -40+0/-6°C | 30±3 MINUTES | | | | | | | | | | | |
| 2. 25°C±2°C | 2~3 MINUTES | | | | | | | | | | | |
| 3. 85+4/-0°C | 30 ±3 MINUTES | | | | | | | | | | | |
| 4. 25°C±2°C | 2~3 MINUTES | | | | | | | | | | | |
| MECHANICAL PERFORMANCE | | | | | | | | | | | | |
| ITEM | CONDITIONS | SPECIFICATIONS | | | | | | | | | | |
| 5. SOLDERABILITY | THE LEAD IS IMMERSSED IN A 260±5°C SOLDER BATH WITHIN 2±0.6 SECONDS. | A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM 95% OF THE SURFACE | | | | | | | | | | |
| 6. RESISTANCE TO SOLDERING HEAT | REFLOW CHART AS ATTACH SHEET. TWICE PASS. | A | | | | | | | | | | |
| 7. SHOCK | FREE DROPPING FROM 75 cm HEIGHT 3 TIMES ON A HARD WOODEN BOARD. | A | | | | | | | | | | |
| 8. VIBRATION | FREQUENCY : 10~55Hz, AMPLITUDE (TOTAL EXCURSION): 1.5mm±15%, SWEEP TIME : 1MIN, 3 DIRECTION (X, Y, Z) EACH 2 H. | A | | | | | | | | | | |
| 9. SEALING | <input type="checkbox"/> THE CRYSTAL / FILTER UNIT SHALL BE IMMERSSED IN A WATER AT 90 ~ 95°C FOR 5 ±0.5 MINUTES. THEN 25±2°C 1~2 H BEFORE TESTING. | B,C | | | | | | | | | | |
| | <input type="checkbox"/> MASS-SPECTROMETER-TYPE LEAK DETECTOR SHALL BE USED TO MEASURE THE LEAKAGE RATE OF GAS THROUGH ANY FAULTY SEAL. | D | | | | | | | | | | |

| X'TAL | RELIABILITY SPECIFICATION | |
|-------------------------------|--|----------------|
| REFER TO | JIS C 6701 | |
| APPLICATION | SMD TYPE | |
| MECHANICAL PERFORMANCE | | |
| ITEM | CONDITIONS | SPECIFICATIONS |
| 10. TERMINAL STRENGTH | <p>SHALL BE PRESSURIZED AT A SPEED OF APPROX.0.5mm/sec IN THE DIRECTION INDICATED BY THE ARROW UNTIL THE BENDING WIDTH REACHES 3mm AND HELD FOR 5 SECONDS.</p>  | A |
| 11. STICKING TENDENCY | <p>A R0.5 JIG SHALL BE USED TO APPLY A 10N DEAD LOAD IN THE DIRECTION INDICATED BY THE ARROW TO THE ELEMENT AND RETAIN IT FOR 10 SECONDS.</p>  | A |
| 12. ELEMENT ASSEMBLY STRENGTH | <p>A R0.5 PRESSURIZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS.</p>  | A |

| X'TAL | RELIABILITY SPECIFICATION | |
|----------------|--|------|
| REFER TO | JIS C 6701 | |
| APPLICATION | SMD TYPE | |
| SPECIFICATIONS | | |
| SYMBOL | STANDARD | NOTE |
| A | 1. FREQUENCY CHANGE PERMITTED. $\Delta F \leq \pm 5 \text{ppm}$. 2. EQUIVALENT SERIES RESISTANCE CHANGE PERMITTED. $\Delta CI \leq \pm 5.0 \Omega$ or $\pm 20\%$ WHICHEVER IS THE LARGE. | |
| B | INSULATION RESISTANCE 500M Ω MIN. | |
| C | NO BUBBLES COMING UP FROM INTERIOR OF THE HOLDER. | |
| D | LEAK RATE $2.1 \times 10^{-9} \text{ Pa} \cdot \text{m}^3/\text{s}$ ($2.1 \times 10^{-8} \text{ mbar} \cdot \text{l/s}$) MAX. | |



| Application | Temperature/Time | T1/t1 | T2/t2 |
|---------------|------------------|--------------------|----------------------|
| Lead Free | | 260±5°C/10 Sec Max | 225°C Min/60 Sec Max |
| Non Lead Free | | 240±5°C/10 Sec Max | 200°C Min/40 Sec Max |

| | | | | | | |
|-----|---------------------------|-----------|--------------|---------------------------|----------|--------------|
| 4 | ADD 225 °C Min/60 Sec Max | '06.06.13 | DRAWING NAME | CERAMICS SMD REFLOW CHART | | |
| 3 | ADD NOTE | '04.11.22 | DRAWING NO. | FLOW-004 | | |
| 1 | NEW ISSUANCE | '99.12.10 | SCALE | | UNIT | |
| NO. | MODIFY CONTENTS | DATE | APPROVE | <i>Casta</i> | DESIGNER | <i>Cindy</i> |