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R & D Dept.
Goshomiya Works
Hitachi Chemical Co., Ltd.

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>AC-7106U</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallest connection circuit</td>
<td>Line</td>
<td>mm</td>
<td>pcs</td>
</tr>
<tr>
<td>Spacing</td>
<td>Resolution</td>
<td>m</td>
<td>/mm</td>
</tr>
<tr>
<td>Thickness</td>
<td>m</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>mm</td>
<td>1.2, 1.5, 2.0</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>m</td>
<td>50, 100</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>-</td>
<td>Transparent(gray)</td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>mm</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>80 °C</td>
<td>10</td>
</tr>
<tr>
<td>Pressure</td>
<td>MPa</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>s</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>180 °C</td>
<td>10</td>
</tr>
<tr>
<td>Pressure</td>
<td>MPa</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Time</td>
<td>s</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Packed</td>
<td>-</td>
<td>7 months after date of manufacture when stored at -10 to 5 °C.</td>
<td></td>
</tr>
<tr>
<td>Unpacked</td>
<td>-</td>
<td>1 month at 25 °C or below and 70%RH or below.</td>
<td></td>
</tr>
<tr>
<td>Pre-bonded</td>
<td>-</td>
<td>2 months at -10 to 5 °C, 1 month at 25 °C or below and 70%RH or below.</td>
<td></td>
</tr>
<tr>
<td>Repairability</td>
<td>-</td>
<td>Repairable</td>
<td>By acetone or toluene</td>
</tr>
<tr>
<td>Connection resistance</td>
<td></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td></td>
<td>-</td>
<td>10^12</td>
</tr>
<tr>
<td>Peel strength(20 °C)</td>
<td>kN/m</td>
<td>1.2</td>
<td>ITO glass / TCP hot-bonded</td>
</tr>
<tr>
<td>Tack strength(20 °C)</td>
<td>kN/m</td>
<td>0.08</td>
<td>ITO glass / TCP cold-bonded</td>
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<tr>
<td>Separator peeling strength</td>
<td>gf/2.5mm</td>
<td>2.5</td>
<td>ITO glass</td>
</tr>
<tr>
<td>Operating range</td>
<td>Temperature</td>
<td>°C</td>
<td>-40 to 100</td>
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<tr>
<td></td>
<td>Current</td>
<td>A/mm²</td>
<td>50 or below</td>
</tr>
<tr>
<td></td>
<td>Voltage</td>
<td>V</td>
<td>50 or below</td>
</tr>
</tbody>
</table>

Notes:
1) Take ANISOLM out of the refrigerator or other storage without taking it out of its hermetic containers. Leave the ANISOLM in the containers at room temperature for about an hour. Then make sure that it does not risk condensation before using it.
2) Connection resistance: The table indicates a half of the resistance between neighboring circuits. Current measured: 1mA. Includes the circuit resistances of the TCP and ITO electrodes all over.
3) Tack strength: Pre-bond an ANISOLM sample to an ITO glass, peel its separator off, then tack a TCP to it at room temperature. Then measure the tack strength of this sample.
4) Operating range: As per reliability tests using Hitachi's test pieces. (This range varies according to the material used and external stress applied. Check the reliability of specific pieces.)

The values given above represent typical measurements, not guaranteed ones.
2. Precautions in Bonding

2.1. Connection time and ANISOLM temperature (Typical)

Head temperature: 295 °C
Backup temperature: 40 °C
TCP: Pt, 75 ± m; Cu, 18 ± m; Sn plating

Glass board: 1.1 mm

Ratio of temperature reached 5 seconds later: 90% or more of the ultimate temperature (°C)

2.2. Measuring ANISOLM temperature

2.3. Heat/Pressure Head

(1) Adjust carefully the evenness and parallelism of the heating head to keep the equal pressure.

(2) Use a head slightly wider than the ANISOLM piece to be connected.

- Example: ANISOLM width, 2.5 mm; head width, 3.0 mm

(3) Tip the head with a thin and hard cushion, not a soft and thick one. Silicon rubber (about 0.2 mm thick with a hardness of 70 degrees or above) may be used for example.

The use of too soft a cushion or excessive pressure in connection will drive adhesive in the space toward the end, resulting in insufficient adhesion. Be particularly careful when the space is wider than the circuits.

2.4. Misalignment of Opposite Circuits

(1) Align opposite circuits well. Do not let them get misaligned.

(2) In designing FPCs, allow for the misalignment of opposite circuits due to their expansion during connection.

(3) Keep the circuit misalignment at or less than the circuit width.
3. Connection Reliability
- Connection circuits
  TCP: Pl, 75 μm; Cu, 36 μm; Sn plating; pitch, 100 μm
  Glass: ITO electrodes all over
- Bonding conditions: 170 °C - 2MPa - 15s; ANISOLM width 1.5mm

3.1. Changes in connection resistance in a moisture absorption and freeze test
(-30 °C, 60min  70 °C, 100min  95%RH, 60min)

3.2. Changes in connection resistance in a thermal shock test
(-40 °C, 30min  room temperature, 5min  100 °C, 30min)
3.3. Changes in connection resistance in a high-temperature, high-humidity test (85°C, 85%RH)

AC-7106U·25 changes little in connection resistance over time in various tests, thus a stable connection reliability is obtained.
4. Effect of Bonding Temperature on Connection Reliability

-Connection circuits
TCP: Pl, 75 μm; Cu, 36 μm; Sn plating; pitch, 100 μm
Glass: ITO electrodes all over
-Bonding conditions: 180, 190, 200 ºC - 2MPa - 10s; ANISOLM width 1.5mm

4.1. Changes in connection resistance in a moisture absorption and freeze test
(-30 ºC, 60min 70 ºC, 100min  95%RH, 60min)

4.2. Changes in connection resistance in a thermal shock test
(-40 ºC, 30min  room temperature, 5min  100 ºC, 30min)

4.3. Changes in connection resistance in a high-temperature, high-humidity test (85 ºC, 85%RH)

AC-7106U-25 connected at 170 ºC to 200 ºC change little in connection resistance over time, thus a stable connection reliability is obtained.
5. Effect of Bonding Pressure on Connection Reliability

- Connection circuits
  TCP: Pi, 75 µm; Cu, 36 µm; Sn plating; pitch, 100 µm
  Glass: ITO electrodes all over

- Bonding conditions: 170 ºC - 1-3 MPa - 15s; ANISOLM width 1.5mm

5.1. Changes in connection resistance in a thermal shock test
(-40 ºC, 60min → room temperature, 100min → 100 ºC, 60min)

5.2. Changes in connection resistance in a high-temperature, high-humidity test (85 ºC, 85%RH)
6. Peel Strength
   - Connection circuits
     TCP: Pi, 75 \( \mu \) m; Cu, 36 \( \mu \) m; Sn plating; pitch, 100 \( \mu \) m
     Glass: ITO electrodes all over; ANISOLM width 1.5mm

6.1. Connection Temperature Characteristics of Peel Strength

6.2. Changes in peel strength in a high-temperature, high-humidity test (85\( ^\circ \), 85%RH)

Our high-temperature, high-humidity test indicated a considerably small decline in the adhesive strength of samples, thus showing the high stability of our product.
7. Insulation Reliability
-Connection circuits
  Comb Circuit TCP: Pl, 75 μm; Cu, 36 μm; Sn plating; pitch, 100 μm
  Plate: Insulation glass plate, ANISOLM width 2.5mm
- Measuring method
  Measure the resistance of samples with the condition to 50V DC for 60 seconds.
  Measurement condition: 23°C and 65%RH
  Reliability of test condition: High-temperature, High-humidity (85°C, 85%RH)

8. Physical Properties

<table>
<thead>
<tr>
<th>ANISOLM</th>
<th>Elastic modules (GPa)</th>
<th>tan μ max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>AC-7106U</td>
<td>1.2</td>
<td>125</td>
</tr>
</tbody>
</table>

- Measuring conditions
  DVE: hardened specimens (170 °C, 2min); tensile mode
  Frequency, 10Hz; programming rate, 10 °C/min.