Background Statement for SEMI Draft Document 4522
NEW DOCUMENT: SPECIFICATION FOR PLASTIC TAPE FRAME FOR 300 mm WAFER

Note: This background statement is not part of the balloted item. It is provided solely to assist the recipient in reaching an informed decision based on the rationale of the activity that preceded the creation of this document.

Note: Recipients of this document are invited to submit, with their comments, notification of any relevant patented technology or copyrighted items of which they are aware and to provide supporting documentation. In this context, “patented technology” is defined as technology for which a patent has issued or has been applied for. In the latter case, only publicly available information on the contents of the patent application is to be provided.

Background

With the change to larger diameter wafers, such as the increase use of 300mm wafers and the eventual move to 450mm wafers, the demand for lightweight tape frames is increasing. The demand is driven by the need to reduce transport costs, ensure the safety of the operator, and reduce the environmental load, such as restraining CO₂ generation associated with transportation. However, there is concern that plastic tape frames, which lower user productivity due to process equipment trouble, will be marketed.

The purpose of this standard is to facilitate the development of a plastic tape frame based on an appropriate specification, by clarifying the required specification, from the aspect of the equipment and cassette that use the plastic tape frame, and standardize this specification.

This standard is a specification that summaries the requirements of a plastic tape frame used in the process from dicing, including transportation, to die attach bonding, on the assumption that the cassette, which is stipulated by the “G77 Specification for Frame Cassette for 300mm Wafers”, and the existing processing equipment do not profoundly change. Under SEMI, there is the “SEMI G74 Specification for Tape Frame for 300 mm Wafer” specification, which is based on the metal tape frame. However, the standard stipulated hereafter adds the plastic mechanical characteristics, such as deflection and elasticity, to the plane dimensions of G74, and indicates the precise position range of the vacuum pad position.

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The results of this ballot will be discussed at the next Japanese Packaging committee meeting on May 14, 2008.
SEMI Draft Document 4522
NEW DOCUMENT: SPECIFICATION FOR PLASTIC TAPE FRAME FOR 300 mm WAFER

1 Purpose
1.1 The purpose of this document is to standardize the specification of a plastic tape frame, for a 300mm wafer, which is used between the dicing process and the die bonding process, and for the handling and shipping of wafers.

2 Scope
2.1 This specification is applicable to plastic tape frames for 300mm wafers.
2.2 This standard puts in writing the dimensions, mechanical characteristics and measurement method for the 300mm wafer tape frame.
2.3 This standard can be used as a specification when purchasing tape frames.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents
3.1 JIS standard
JIS K7361-1 — Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single beam instrument

3.2 ISO standard
ISO13468-1 — Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single beam instrument

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

4 Terminology
4.1 Definitions
4.1.1 plastic tape frame — A ring-shaped plastic frame to fix a wafer to itself using wafer tape. It is used between the dicing process and the die bonding process, and for the handling and shipping of wafers.
4.1.2 wafer tape — Adhesive plastic tape to hold the wafer or cut die.

5 Ordering Information
5.1 The purchase order shall include the quantity for the tape frame described by this specification.

6 Requirements
6.1 Dimensions — See Table 1 and Figure 1.

1 Japanese Industrial Standards, Available through the Japanese Standards Association, 1-24, Akasaka 4-Chome, Minato-ku, Tokyo 107-8440, Japan. Telephone: 81.3.3583.8005; Fax: 81.3.3586.2014 Website: http://www.jsa.or.jp
2 International Organization for Standardization, ISO Central Secretariat, 1, rue de Varembé, Case postale 56, CH-1211 Geneva 20, Switzerland. Telephone: 41.22.749.01.11; Fax: 41.22.733.34.30; Website: http://www.iso.ch
Table 1 Dimensions of Tape Frame

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Dimension</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>φA</td>
<td>350 ± 0.5 mm</td>
<td>Inner diameter</td>
</tr>
<tr>
<td>φB</td>
<td>400 ± 0.5 mm</td>
<td>Outer diameter</td>
</tr>
<tr>
<td>C</td>
<td>380 ± 0/-0.5 mm</td>
<td>Width between two cords</td>
</tr>
<tr>
<td>D</td>
<td>380 ± 0/-0.5 mm</td>
<td>Width between two cords</td>
</tr>
<tr>
<td>E</td>
<td>170.4 mm</td>
<td>Outline dimension</td>
</tr>
<tr>
<td>F</td>
<td>172 mm</td>
<td>Outline dimension</td>
</tr>
<tr>
<td>G</td>
<td>86 mm</td>
<td>Outline dimension</td>
</tr>
<tr>
<td>H</td>
<td>90 mm</td>
<td>Outline dimension</td>
</tr>
<tr>
<td>I</td>
<td>120°</td>
<td>Partition out with diameter N as standard</td>
</tr>
<tr>
<td>J</td>
<td>60°</td>
<td>Partition out with diameter N as standard</td>
</tr>
<tr>
<td>tK</td>
<td>2.5 ± 0.1 mm</td>
<td>Plate thickness</td>
</tr>
<tr>
<td>L</td>
<td>190 mm</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>190 mm</td>
<td></td>
</tr>
<tr>
<td>φN</td>
<td>3.2 mm</td>
<td>Pin diameter</td>
</tr>
<tr>
<td>P</td>
<td>100 ± 0.2 mm</td>
<td>Diameter N position</td>
</tr>
<tr>
<td>Q</td>
<td>18 ± 0.2 mm</td>
<td>Diameter N position</td>
</tr>
<tr>
<td>R</td>
<td>276</td>
<td>I Notch position</td>
</tr>
<tr>
<td>S</td>
<td>19.6 ± 0.2 mm</td>
<td>I Notch position</td>
</tr>
</tbody>
</table>

#1 There is no burr on the top edge

6.2 Total luminous transmittance of tape frame — Total luminous transmittance shall be less than 70%.

6.3 Deflection — Deflection shall be less than 2.5 mm. Refer to 7.2 regarding measurement method.

Figure 1
300mm Wafer Plastic Tape Frame Dimension (View from the surface)
6.4 *Elasticity* — After implementing the deflection test, the flatness shall be less than 0.3 mm. Refer to 7.2 regarding measurement method.

6.5 *Flatness* — The whole area of the back surface and the figure 2 shaded area of the front surface shall be less than 0.3 mm.

**NOTE 1:** Vacuum pad position: It is advisable that the shaded area of figure 2 is flat because it is the vacuum position of the machine vacuum pad.

![Flat Area of The Front Surface](image)

**NOTE 2:** Label attachment position: Recommend the area “T” in figure 2 for the label attachment position.

**NOTE 3:** Wafer tape suitability: It is advisable that its suitability, such as adhesiveness and detachability, with the wafer tape is considered.

7 Test Methods

7.1 *Dimensions* — Be measured by a measurement instrument, such as a micrometer caliper, that has a precision of 0.05 mm.

7.2 *Total luminous transmittance of tape frame* — Measure based on JIS K7361-1 or ISO13468-1.

7.3 *Deflection* — Support a frame on two blocks with dimensions of U: greater than 20 mm, Z: greater than 200 mm, and W: 366 ± 1 mm, as shown in figure 3. In the center of the frame, gently place a fixed load (weight: 1±0.01N) with dimensions of X: 50 ± 0.5 mm and Y: 380 ±1 /-0 mm. Measure the deflection (U-V) of the frame. Also, after removing the load, confirm that the frame returns to its original shape on the blocks. Perform the measurements with a linear scale that has a precision of at least 0.5 mm.

![Test method for deflection](image)
7.4 Flatness — Place a frame on a block, which has flatness close to zero. Measure the minimum point and maximum point of the frame using a height gauge, and record the difference of these numerical values. Flip over the frame and repeat the process. The flatness is the larger of these two numerical values.

8 Certification

8.1 Upon request of the purchaser in the contract or order, a manufacturer's or supplier's certification that the material was manufactured and tested in accordance with this specification, together with a report of the test results, shall be furnished at the time of shipment.

9 Packing and Package Labeling

9.1 The product shall be packaged appropriately to prevent deformation, exposure to water and contamination, as well as to prevent damage during normal shipment and transportation.

9.2 The product shall clearly show the purchase number, quantity, gross weight, and supplier name.

9.3 Special packaging and delivery requirements shall be decided between the supplier and purchaser at the time of purchase.

10 Related Document

10.1 SEMI Standard

SEMI G74 — SPECIFICATION FOR TAPE FRAME FOR 300 mm WAFER

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

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