Mounting Broken Wafers for Scribe at Sub-Contractors

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Revision History

Rev	Name	Change	Date
1	Jennifer Welborn	Initial Release	07/02/2009

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1 Purpose and Scope

1.1 Purpose

The purpose of this document is to describe the procedure to be used to mount broken pieces of GaAs wafers so that they can be processed through scribe and break, and eventually picked using an inkless map.

1.2 Scope

This specification applies to GaAs wafers shipped from the Woburn Fab, and wafers that experience breakage prior to the scribe mount process.

2 Acronyms / Terminology and Description / Definition

None

3 Associated Documents

None

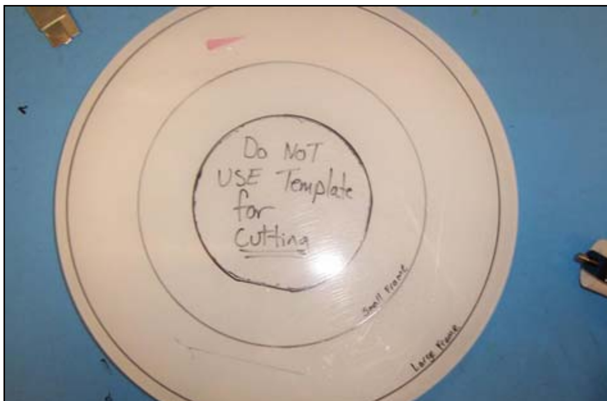
4 Instructions

4.1 Scrap vs Salvage Guidelines

- Scrap all wafers that are broken into more than two pieces. If there is one large piece, and all die attached location die are present, the large piece can be continued
- Wafers with the FLAT ID missing must be scrapped. The FLAT ID is required for wafer verification. If the flat is broke off, but still available, the wafer can be continued
- Notify cell lead, supervisor, or engineer if you are unsure whether a broken wafer can be processed

4.2 Manual Mounting of Broken or Cracked Wafers

- Position a 5" Mylar Overlay Disc over the wafer template of the mounting jig. A new 5" Mylar Overlay Disc should be used for each wafer mounted.



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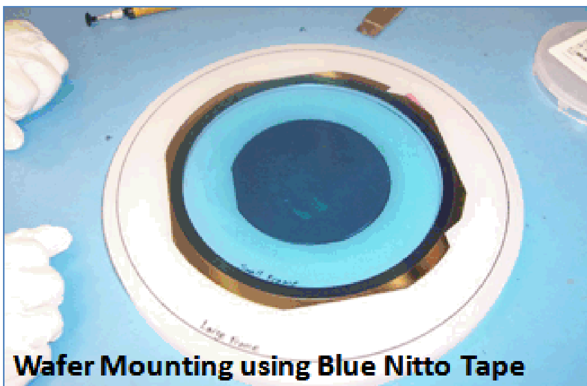
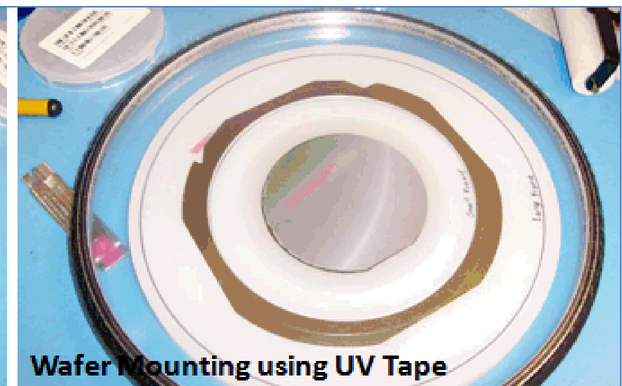
- Using vacuum pen (whole/broken wafers) or lint free paper/Mylar (cracked or broken wafers) place wafer device side down, on the Mylar. Position the wafer so that it is lined up with the wafer outline template.

- Position Broken wafer so that it looks like a "Whole" wafer by aligning the cracked area of the wafer together using the wafer template as a guide. The alignment is important, but it is not critical that the dicing streets are aligned perfectly. The alignment must be less than one die off. The alignment can not be confirmed until the wafer is mounted on the tape.
- Place film frame around wafer (aligning to template for film frame being used).
- Mount the wafer to the tape.
    - **Wafer Mounding using Blue Nitto Tape:** Flip frame over (sticky side down) and the frame to match the template (inner diameter of frame) and place frame on wafer.
    - **Wafer Mounting using UV Tape** - Position film frame around wafer matching the frame to the template. Flip the hoop, with tape, over sticky side down and place on top of the wafer and frame.



Wafer Mounting using Blue Nitto Tape



Wafer Mounting using UV Tape

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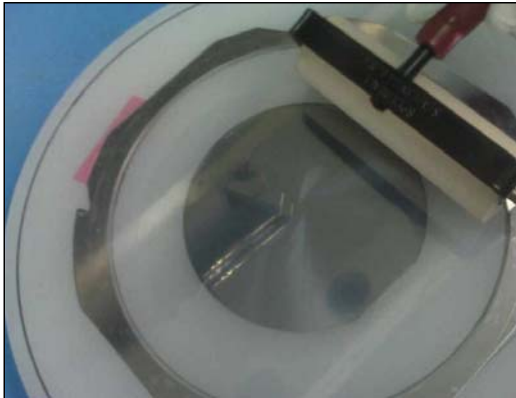
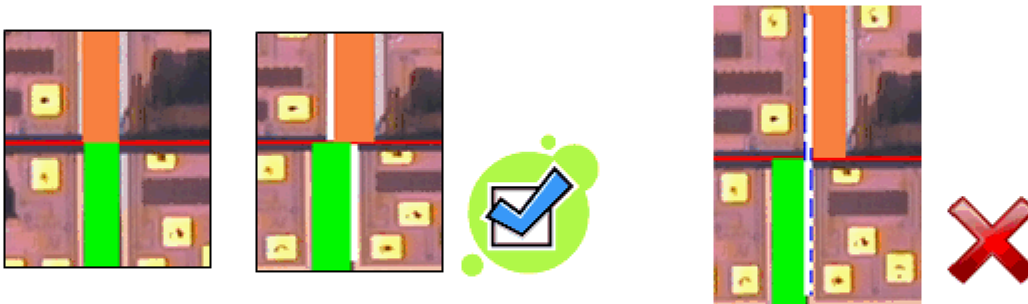
- Use roller to laminate the tape to the back of wafer, and then remove mounted assembly



- Using blunt tip tweezers, carefully remove the 5" Mylar Overlay Disc from the wafer and discard
- Mark the location of the wafer. If the wafer is cracked or broken, mark an arrow on the tape indicating where the crack is located. This mark notifies the person scribing the wafer, that there is a crack and the wafer may require special scribing modifications. See example:

- Wafers that are cracked or broken must be inspected to confirm that the crack and/or two pieces are flat. If the crack or broken area is not flat, place the wafer on hold in Promis and notify engineering.
- Wafers that are broken must be inspected to confirm that the alignment of the dicing lanes is not more than one street misaligned. In the images below, the displacement on the left is acceptable, while that on the rights is not acceptable



- Wafer is now ready to scribe.

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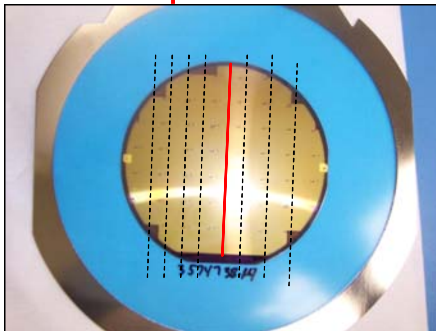
4.3 Scribing Broken or Cracked Wafers

- Accept stained passivation, as long as the stain does not continue onto the bonding area. Accept as is, as shown in the pictures below.
- Check to see if the wafer is cracked or broken.
  - If the wafer is cracked / broken, inspect the wafer using a microscope and confirm that the crack/broken area is flat (no height difference). If there is a height difference in the cracked/broken area, STOP and place the wafer on hold for engineering.
  - If the wafer is cracked / broken, confirm that the dicing streets are in alignment. If the dicing streets are not aligned, the wafer will require the use of Mylar during the scribe process.
  - If the wafer is cracked / broken, confirm that the wafer has been marked in the location of the crack. If not, use a sharpie to mark the location of the crack/broken area.
- Processing wafers that are broken (and pieced back together) MUST be attended at all times. If you must walk away, pause the system
- Scribing parallel to the crack
  - Confirm the alignment is correct prior to the first line scribed. The alignment can be confirmed by moving from top to bottom of the wafer.
  - It may be required to perform the alignment process on the left of the crack and again on the right of the crack.
  - Never leave the scriber unattended while processing a wafer that has been pieced back together.
  - Channel alignment may be required with the first index past the crack. It is important to monitor the process closely when scribing in the area of the crack. When the system indexes across the crack, the channel alignment will be off and there is potential to scribe through the die. Pause the system after completing the last "good" street before the crack, and then index across the crack to resume. Resume after correcting the channel alignment.

Red line represents the crack.



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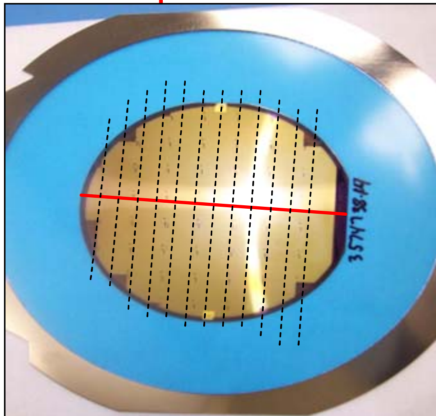
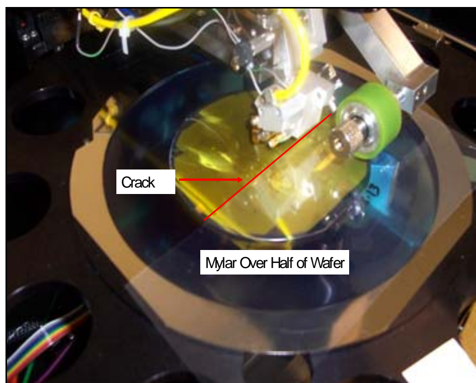
- Scribing perpendicular to the crack
    - The dicing streets across the crack must be aligned to process in a single pass.
    - If the dicing streets across the crack are not aligned, then Mylar must be used to to complete the wafer; the pieces will be scribed separately using the Mylar to protect the wafer piece not being processed.

Red line represents the crack.



- Manual alignment may be required for this orientation. Theta adjustment must be completed and/or confirmed for the area above and below the crack.
- Position a piece of Mylar over one piece of the wafer. It does not matter if the top is covered first, or the bottom. Position the Mylar as close to the crack as possible.



- Complete the scribe process for one piece of the wafer, but do not let the system ROTATE/UNLOAD. Stop/Pause the system when the last streets are being processed
- Remover the Mylar and reposition on the opposite side (area just scribed)
- Confirm theta alignment, and adjust if necessary, on the second piece of wafer to scribe
- Repeat scribe process for all streets on the second piece of wafer
- Remove Mylar when second piece is completed

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