

Customer Service Note

Reconstructed Wafer Packaging

Introduction

To help ensure their safe transport, reconstructed wafers of Aptina's semiconductor products are shipped following specific procedures, including mounting wafers on film frames and packaging the frames in plastic containers. Additionally, Aptina labels the inner containers, antistatic bags, and outer containers of all shipments to enable simple order identification and verification. Refer to [ACSN-03, "Packaging Materials,"](#) for detailed descriptions of the various shipping materials used in the process, as well as recycling information.

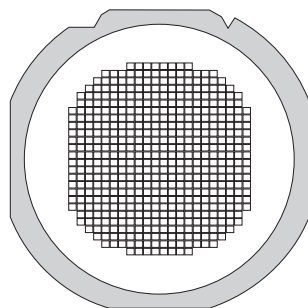
Reconstructed Wafers

The reconstruction process enables Aptina to determine which die are "good." Aptina's products are probed in wafer form, and then background, diced, and separated into good and bad die. The singulated good die are then reconstructed into the approximate shape of a wafer for shipping by affixing them to an ultraviolet release adhesive film on a metal Disco film frame. Please see Micron Technology's technical note, [TN-00-16, "Singulated Die Shipping Media,"](#) for additional details on reconstructed wafers and Disco film frames.

Storage Requirements

Aptina™ die products are packaged for shipping in a cleanroom environment. Upon receipt, the customer should transfer the die or wafers to a similar environment for storage. Aptina recommends the die or wafers be maintained in a filtered nitrogen atmosphere until removed for assembly. The moisture content of the storage facility should be maintained at 30% ±10% relative humidity. Electrostatic discharge (ESD) damage precautions are necessary during handling. The die must be in an ESD-protected environment at all times for inspection and assembly. Die products contained in film frame containers can remain in storage up to three months under these conditions.

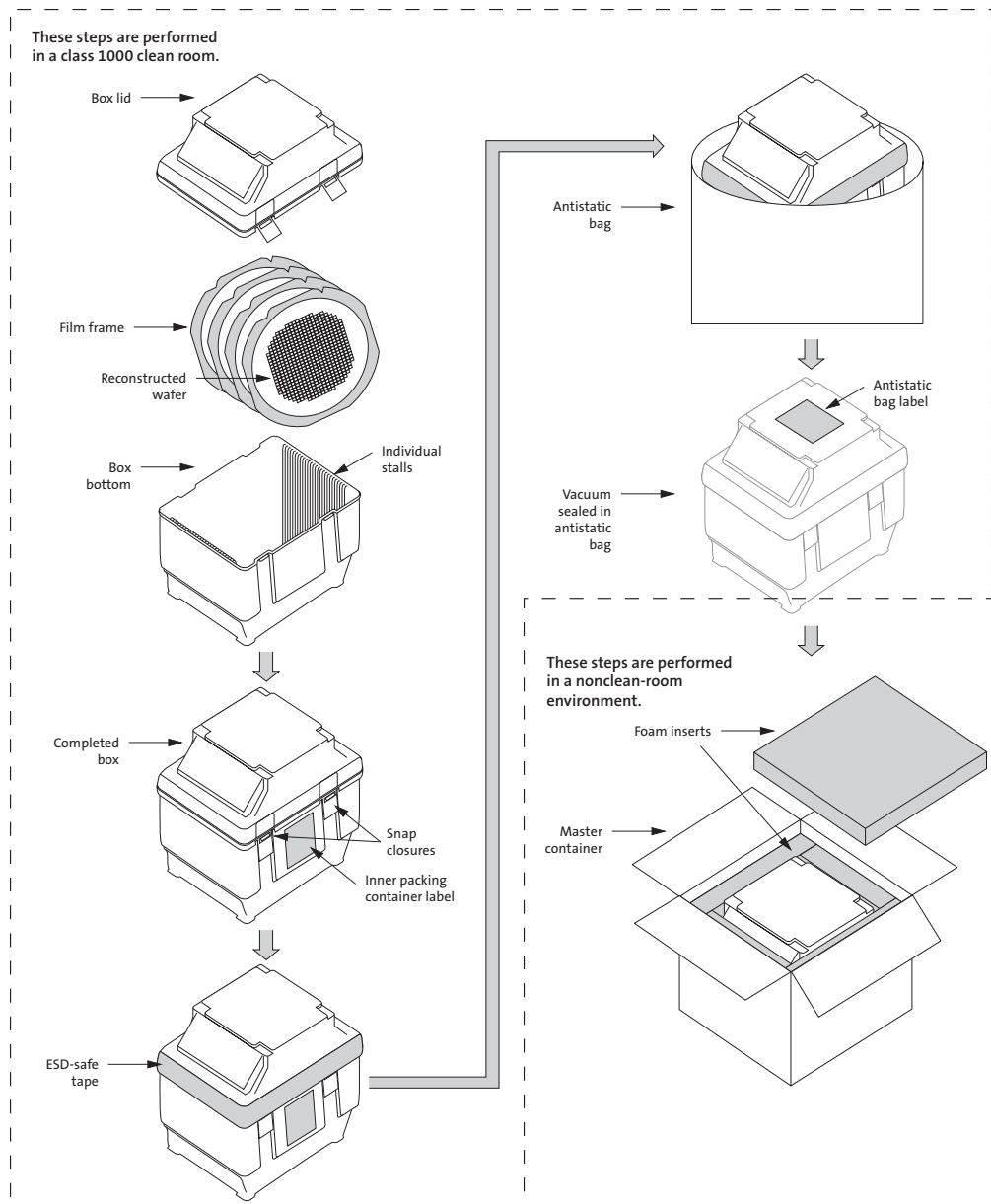
Figure 1: Reconstructed Wafer on Disco Film Frame



Packaging Procedure

Aptina uses film frames to ship reconstructed wafers of thickness $\geq 150\mu\text{m}$; consult Aptina regarding reconstructed wafers $\leq 150\mu\text{m}$. Reconstructed wafers are mounted on Disco film frames, then packaged in plastic containers inside a class 1,000 cleanroom. Each plastic container includes a maximum of 13 double-spaced film frames for shipping reconstructed image sensor wafers. The plastic container is taped with ESD-safe tape along its outside seams and vacuum sealed in a class 100 antistatic bag. In a noncleanroom environment, it is placed in a padded master container measuring 16in x 13.25in x 16.75in, which can hold one vacuum-sealed plastic container. For protection, foam pads are placed on all sides of the plastic containers, including the tops. Figure 2 depicts the packing sequence for film frames.

Figure 2: Film Frame Packaging



Unpacking Product Shipments

Follow the procedure outlined in Figure 3 on page 4 for safely unpacking Aptina products shipped in film frame containers.

Procedure for Unpacking Film Frame Shipments

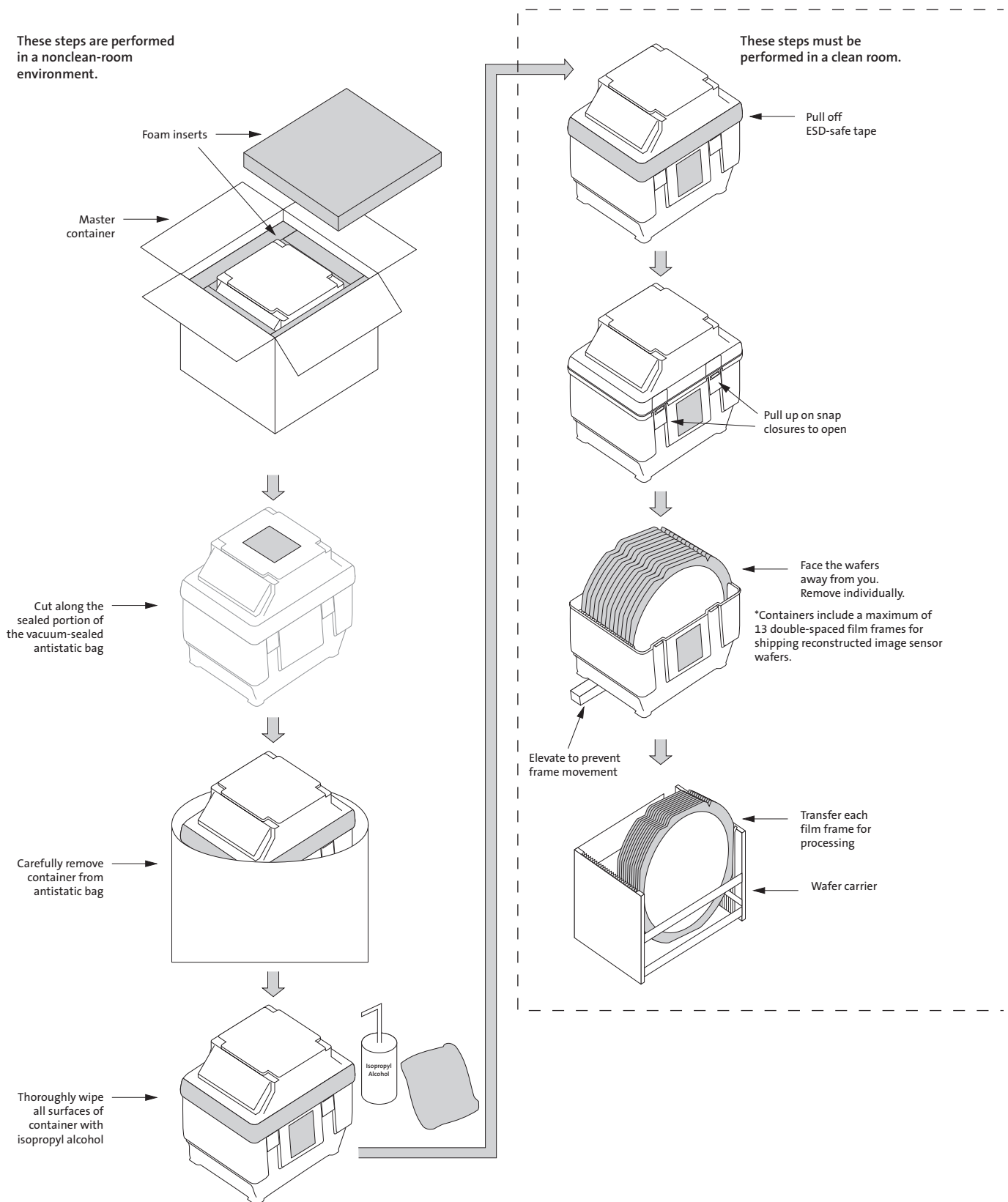
Steps 1–4 must be performed outside of a cleanroom environment.

1. Remove the inner plastic container(s) from the master shipping box and place on a clean, level surface.
2. Cut the surrounding tape to free the corners of the antistatic bag. Then cut along the sealed portion of the bag to open.
3. Carefully remove the film frame container from the bag.
4. Ensure all surfaces of the film frame container are thoroughly wiped with isopropyl alcohol before entering a cleanroom.

Steps 5–8 must be performed inside a cleanroom environment.

5. Detach the ESD-safe tape wrapped around the seams of the film frame container.
6. With one hand placed on top of the film frame container for support, use your other hand to pull up the snap closures to open. Remove the lid.
7. Rotate the container so the exposed reconstructed wafers face away from you. Then, to help prevent scratches or other damage to the wafers, elevate the end of the container further from your body so the container and the film frames tilt slightly toward you. Ensure the container is stable before proceeding. Remove the film frames from the container one by one, starting with the film frame closest to you.
8. Transfer each film frame to a wafer carrier for processing.

Figure 3: Procedure for Unpacking Film Frame Shipments



Returning Film Frames and Containers

As part of Aptina's environmental protection programs, we have designed a process for cleaning and reusing film frames and film frame containers. Figure 4 on page 6 details the process for returning empty film frames and containers. Please see Figure 5 on page 7 for instructions on how to return die in film frame containers to Aptina.

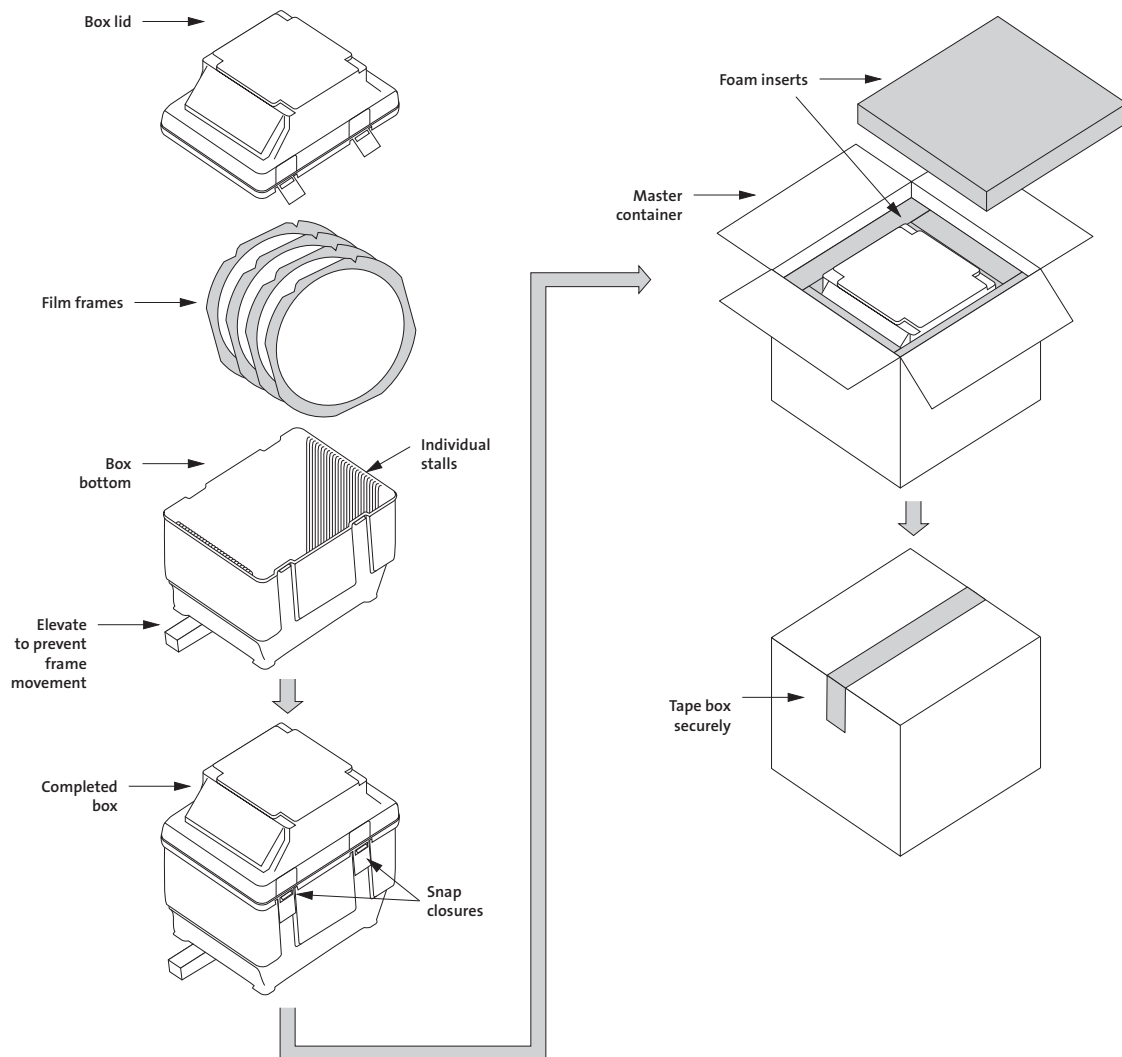
For more information on returning die, contact your Aptina inside sales representative.

Please note that Aptina is not responsible for non-Aptina film frames or containers shipped by the customer to Aptina, to its frame recycler, or to its agent.

Procedure for Returning Empty Film Frames and Containers

1. Carefully place each film frame back into the plastic container. Verify that each frame is in its own slot and is aligned with the forks on the bottom of the container. Note that the container should be set at an angle to prevent movement of the film frames.
2. Verify that each film frame is evenly spaced in the container.
3. Place the container lid over the film frames, aligning the forks on the lid with the frames. Apply pressure to the lid and carefully snap each clasp shut.
4. Place the container in a padded box, ensuring that padding sufficiently covers all surfaces of the plastic container. Do not wrap the container in an antistatic bag when shipping film frames without die.
5. Tape the box securely, and ship it to the designated facility.

Figure 4: Procedure for Returning Empty Film Frames and Containers



Procedure for Returning Die in Film Frame Containers

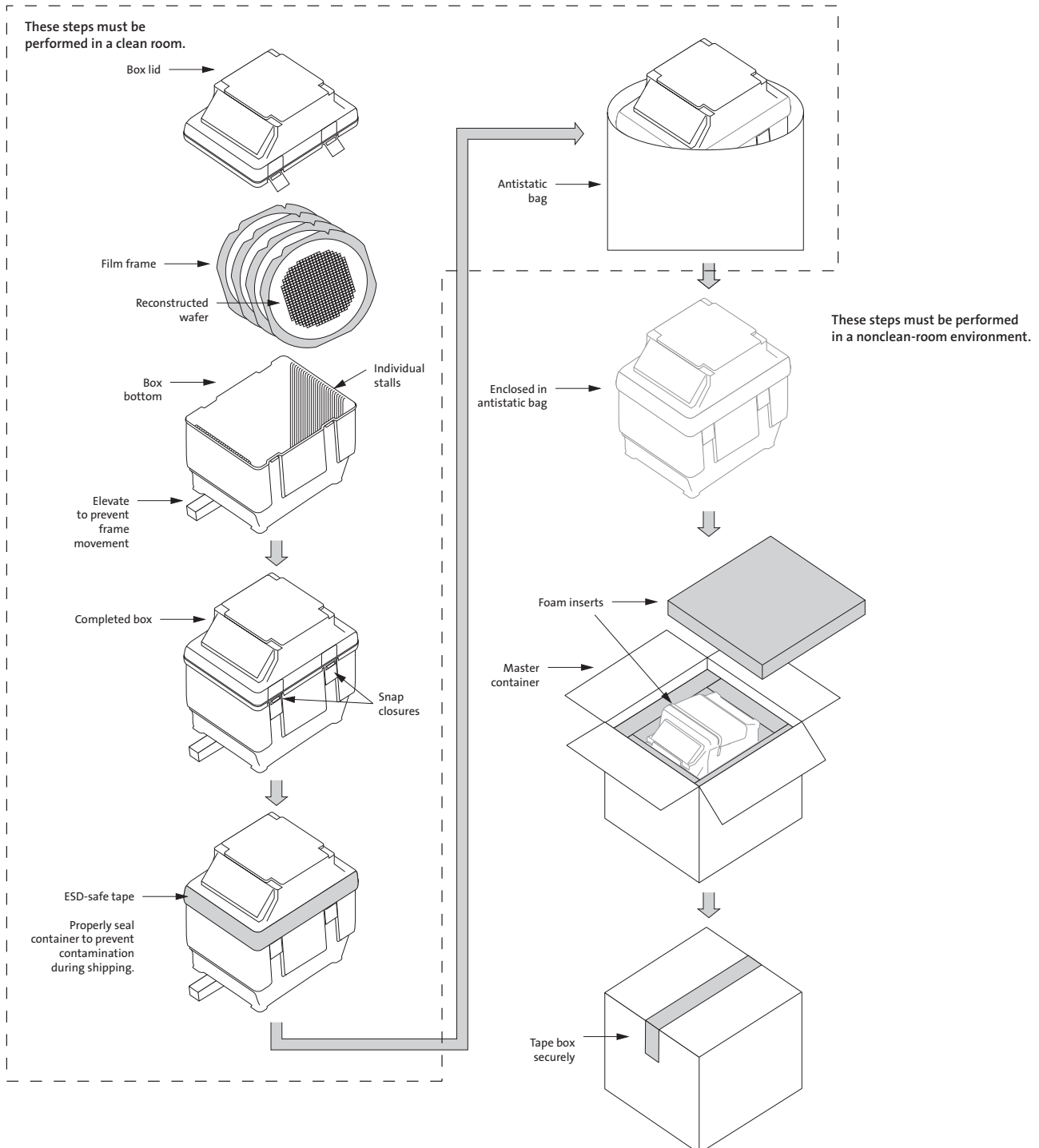
Steps 1–5 must be performed inside a cleanroom environment.

1. Carefully place film frames back in the plastic container. For reconstructed image sensor wafers, place no more than 13 double-spaced film frames in each plastic container. Verify that each frame is in its own slot and is aligned with the forks on the bottom of the container. Note that the container should be set at an angle to prevent movement of the film frames.
2. Verify that each film frame is evenly spaced in the container.
3. Place the container lid over the film frames, aligning the forks in the lid with the frames. Apply pressure to the lid and carefully snap each clasp shut.
4. Tape the outside seams of the plastic container with ESD-safe tape. It is very important to properly seal the container to prevent contamination during shipping.
5. Place the container in an antistatic bag and seal by folding over the opening of the bag.

Steps 6–7 must be performed outside of a cleanroom environment.

6. Place the bagged container in a padded box, ensuring that padding sufficiently covers all surfaces of the plastic container.
7. Tape the box securely, and ship it to the designated facility.

Figure 5: Procedure for Returning Die in Film Frame Containers



Shipping Labels

Aptina uses various packaging labels with its reconstructed wafer shipments which enable customers to verify orders and to identify the packaged contents quickly and easily. Refer to Figure 2 for the approximate location of the labels described in the following sections on Aptina’s reconstructed wafer packaging.

Master Container Shipping and Bar Code Labels

For all reconstructed wafer shipments, Aptina uses a standard bar code label as well as a standard shipping label. Figure 6 on page 8 shows an example of the standard shipping label, Figure 7 on page 9 shows an example of the standard bar code label, and Figure 8 on page 9 depicts the wafer bar code label used on Aptina’s master containers. The following section, “Inner Packing Container Labels,” details the labels used on Aptina’s inner shipping containers.

Master Container Shipping Label Information

Aptina’s master container shipping labels include the following information:

- Ship-from name: Aptina’s name and address
- WB #: Courier waybill number
- Child W/B: Waybill number(s) for multiple piece(s) in shipment
- Piece: Master container package count
- PO #s: Customer purchase order number
- Ship-to name: Customer’s name and ship-to address
- PKG ID: Invoice or packing slip number
- Shipping plant: Aptina location from which the order was shipped:
 - AP01 = Boise, Idaho
 - AP03 = Singapore

Figure 6: Standard Master Container Shipping Label

Aptina Pte Ltd c/o 990 Bendemeer Road 339942 Singapore Singapore	AP03
WB # 638030055867 / 0087659818 Child W/B:63803005867 ***** Piece 1 of 1 ***** PO #s XXXXXXXX XXXXXXXX	COMPANY NAME ADDRESS CITY STATE/PROVINCE ZIP CODE COUNTRY PKG ID: 87659819A1 

Master Container Bar Code Label Information


Aptina’s master container bar code labels include the following information:

- Lot number, which is represented by the bar code at the top of the label
- Aptina’s marketing part number, which is represented by the bar code at the bottom of the label
- Device ID
- Fab in which the product was made
- Quantity of individual die in shipment
- Quantity of individual wafers in shipment
- Date code, if designated
- Customer revision, if designated
- Wafer thickness, in microns

Figure 7: Standard Master Container Bar Code Label

(3S) PKG ID: 87189127A1 	Ship_To_Name Address City, ST ZIP Code Country
(1P) SPLR PROD ID: MT9M131C12STC 	Aptina Pte Ltd c/o 990 Bendemeer Road 339942 Singapore Singapore
(Q) QUANTITY: 1793 EA 	PACKAGE COUNT: 1 OF 1 16.0 x 12.0 x 8.0 in 40.6 x 30.5 x 20.8 cm
(K) TRANS ID: 2596PW3329100 	PACKAGE WEIGHT: 10.9 lb/4.9 kg SHIP DATE: 05/26/2008
(P) CUST PART NO: MT9M131C12STC 	(4L) COUNTRY OF ORIGIN  US

Figure 8: Singulated Die/Wafer Master Container Bar Code Label

		
C26AM9C36385889.003		
MT9T013D00STCP C26AC1		
C26A		
FAB X	XXXX DIE	X WAFERS
DATECODE	CUST REV	XXXum
		
<i>DigitalClarity</i> TECHNOLOGY		

Notes: 1. “Wafers” refers to the total quantity of film frames in the shipment.

Inner Packing Container Labels

Aptina also affixes a standard label to each shipment's antistatic bag and inner packing container. This label is shown in Figure 9.

Figure 9: Standard Inner Packing Container and Antistatic Bag Label



- Notes:
1. "Wafers" refers to the total film frame quantity of a lot.
 2. "Die Qty" refers to the total die quantity of the lot.

Revision History

Rev. B	9/08
<ul style="list-style-type: none">• Corrected logo in Figures 8 and 9	
Rev. A	6/08
<ul style="list-style-type: none">• Initial release	