
To

Changes in Packing Material and Packing Method for New PW-Mold, PW-Mold, DP, and DPAK+ Products

Please be informed that we will change the packing material and packing method of our semiconductor products delivered to your company. Details of the changes are provided as follows.

Date: January 30, 2015
Reference No.: H440-4L-009P
Himeji Operations – Semiconductor
TOSHIBA Corporation
Semiconductor & Storage Products Company

Announcement

1. Affected Product Type

See the attachment.

2. Purpose of Changes

To unify materials and improve quality.

3. Changed Contents

Package	Product Name
New PW-Mold	See the attachment.
DPAK+	See the attachment.
DP	See the attachment.
PW-Mold	See the attachment.

	Changes	Effect		Record
①	The embossed tape will have ribs.	The position of a product in the tape will be fixed.	Quality improvement	The new materials have already been applied to new products. The new materials have been used for more than two years. ※Cumulative total: Applied to around 50M pcs
②	Only the black embossed tape will be applied. (The transparent tape will be abolished.)	Changing from the non-conductive material to the conductive will have antistatic effect.	Quality improvement	
③	Only the black reel will be applied. (The white reel will be abolished.)			
④	The transparent bag for a reel will be abolished.	The abolishment of the reel bag will lead to less waste as an environmental measure.	Less waste	
⑤	In the wake of bag abolishment, the size of the inner box will be changed. (The change will be made only for PW-Mold. No change for other products.)	In the wake of bag abolishment stated in ④, the inner box will be changed to suit to the reel size.	Less waste	

See the attachment for the details.


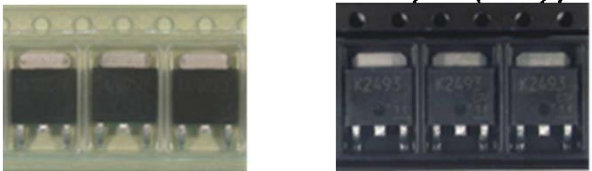
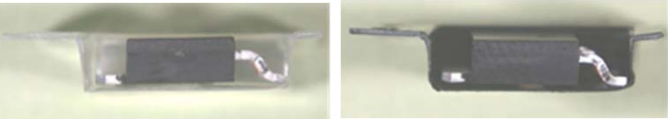
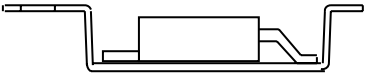



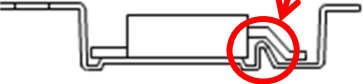
4. Timing of Changes

The changes will start from April 2015 production.





5. Other

Nothing will be changed other than the packing materials above.

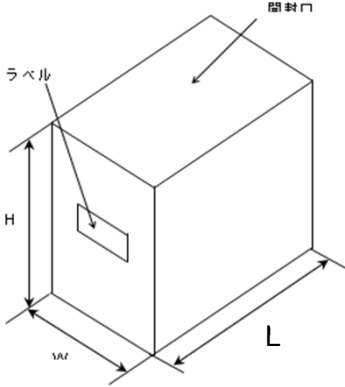

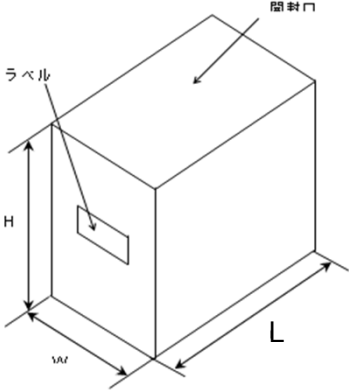

Changes in Packing Material and Packing Method

Material	Before Change	After Change
<p>Embossed tape</p>	<p>There are two types of tape depending on the product type (L-type and R-type tapes are the same in design).</p> <p>Transparent Black</p>  <p>Products inserted in tape (L-type)</p>  <p>Cross-section of a pocket</p>  <p>Diagram</p> 	<p>The tapes have ribs. L-type and R-type tapes are different in design.</p> <p>L-type (black) R-type (black)</p>  <p>Products inserted in tape L-type R-type</p>  <p>Cross-section of a pocket</p>  <p>Diagram</p>  <p>Rib added</p> <p>※The pocket size of the embossed tape will not be changed.</p>

Changes in Packing Material and Packing Method

Material	Before Change	After Change
<p>Reel</p>	<p>There are four types of reel depending on the product type.</p> <p>330mmΦ/180mmΦ White/Black</p>  <p>Products packed in an inner box (bagged)</p> 	<p>Black only</p> <p>330mmΦ/180mmΦ</p>  <p>The reel bag is abolished.</p> 

Changes in Packing Material and Packing Method

Material	Before Change	After Change
<p>Inner box</p> <p>Change only for PW-Mold</p> <p>No change for New PW-Mold, DP, and D-PAK+</p>	<p>Inner box size (PW-Mold) (700 pieces of product in a tape): 190(L) * 140(W) * 200(H)mm</p>  <p>Products packed in an inner box (bagged)</p> 	<p>Inner box size (PW-Mold): 190(L) * 110(W) * 200(H)mm</p>  <p>Products packed in an inner box (no bag)</p>  <p>※ The number of reels and products in one inner box will not be changed.</p>

Background to Adoption of Packing Bag

■ Background to Adoption of Packing Bag

How we adopted the packing bag at a time of start-up of New Pw Mold products is as follows:

At a time of start-up of New Pw Mold products (in the 1990s), we decided to adopt a packing method that had been applied to other packages, by which reels in bags are put in a box.

This is because persons in charge of development had insufficient knowledge of reel packing. We presume that although they saw no need in taking measures against moisture when determining a bag, they did not bear in mind a packing method of “no bag” since many other packages were put in bags.

※The bag is not moisture-proof.

We reviewed our packing method in terms of reduction of waste as an environmental measure. As a result, we have decided to stop using bags for products which do not require bags.

Your understanding and cooperation would be greatly appreciated.

Evaluation for Bag Abolishment

■ Abolishment of Packing Bag

The following shows evaluation data (methods, conditions, criteria, results) on transportation-related items including humidity, static electricity, and drop.

Regarding humidity, as a result of a test in the conditions below, moisture-proof packing was turned out to be unnecessary for the target products.

■ Evaluation Data:

<Test Method> Moisture absorption: Ta=85°C, RH=85%, 72h Reflow: 260°C (peak), three times
Control level of moisture absorption ⇒ Equivalent to MSL1

■ Evaluation Result:

The subsequent reliability test (Temperature cycle: 100 cycles; Pressure cooker: 96 h) showed no problem. We judged the moisture level to be equivalent to MSL1.

Regarding static electricity and drop:

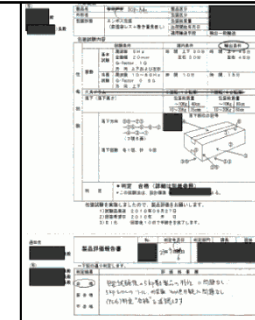
■ Evaluation Data:

We confirmed the results of packing and transportation tests had no problem with the packing after the change.

<Test Condition> Frequency: 5Hz Total amplitude: 20 mm G-factor: 1 G
Direction: From side to side
Time: Side to side 45 min, Side to side 45 min
Incline impact test: 240 cm
Drop position (height): 40 cm The number of drop: 9 times

■ Electrical characteristics were measured after products without a bag were forcibly vibrated and electric-charged. No problem was found.

Evidence of Packing Test



Effect of Change in Embossed Tape

Changing the embossed tape can restrain movement of a product in a pocket.

■ Consideration on movement of a product in the longitudinal and lateral direction based on the size of the embossed tape

«Product movement in the lateral direction in a pocket / Slant of a product»

- A product can move up to 0.3 mm in the lateral direction in the pocket of both the old and new tapes.

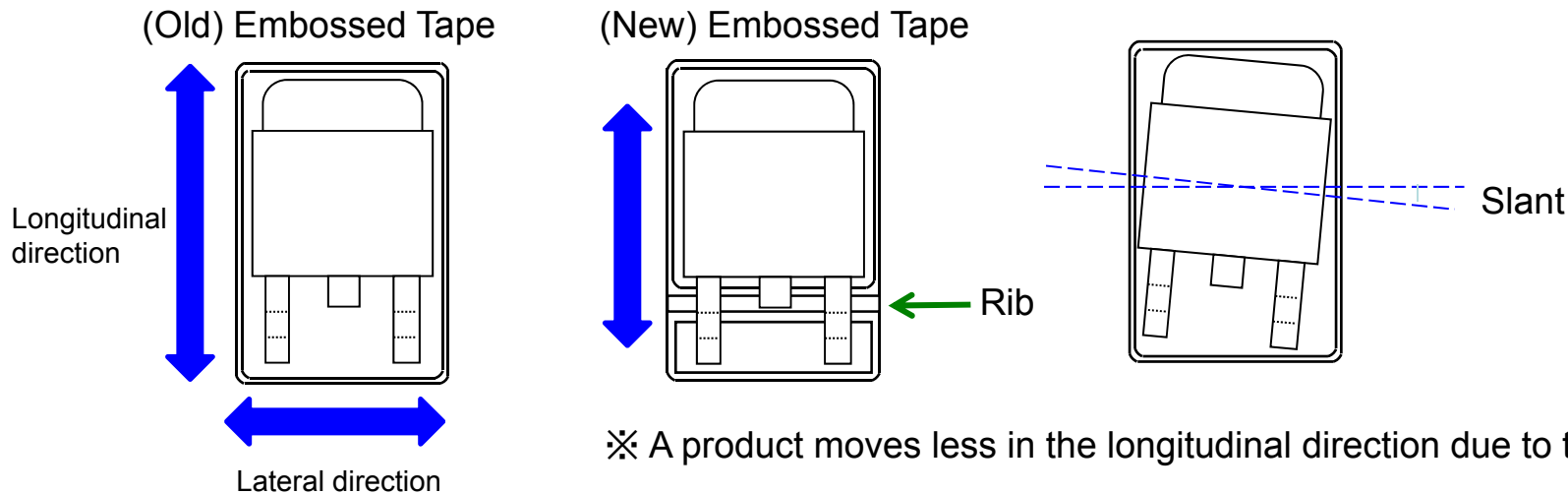
- The slant of a product is determined by the margin of the pocket lateral size (0.3 mm). The slant is 2.3° regarding both the old and new tapes.

«Product movement in the longitudinal direction in a pocket»

- A product can move up to 0.6 mm in the longitudinal direction in the pocket of the old tape.

A product can move up to 0.35 mm in the longitudinal direction in the pocket of the new tape with ribs.

Given the results above, with a rib, a product moves less in the longitudinal direction in a pocket, which causes less friction between the lead surface (plated surface) and the tape. We therefore expect that the change will be able to reduce conductive foreign material.



Measurement of Electrostatic Charge Amount

《Amount of Electrostatic Charge》

The amount of electrostatic charge was measured before and after the reel change.

- Measurement of electrostatic charge amount of reels

In the wake of bag abolishment, the amount of electrostatic charge was measured before and after the change.

- Measurement of electrostatic charge amount of reels in a bag

[Measurement Condition]

Measurement Apparatus: STATIRON DX Temperature: 24°C Humidity: 40%

Item	Bag	Reel	Amount of Electrostatic Charge	Measured Point
Current	Presence	White	About 260V	Outside of bag
		Black	About 130V	Outside of bag
After Change	Absence	Black	About 5V	Reel surface
Reference	Absence	White	About 500V	Reel surface

Given the measurement results above, the change to the black reel can constrain the electrostatic charge amount and reduce foreign material attachment. In addition, seeing that the amount of triboelectric charge of reels exposed to open air can be constrained, the change can also reduce floating foreign materials which are brought into a customer's factory along with reels.

※ As shown above, the bag is not antistatic.

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