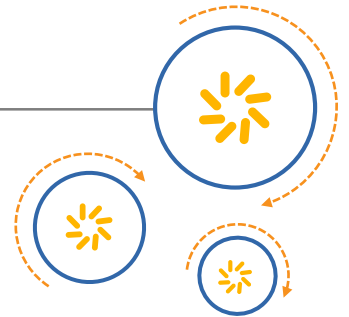




Qualcomm Technologies, Inc.



PCN 3501 All CSR Products

Process Change Notification

80-P5906-1 Rev. A

April 29, 2016

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Qualcomm Technologies, Inc.
5775 Morehouse Drive
San Diego, CA 92121
U.S.A

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Process Change Notification





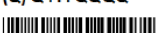
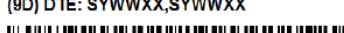

	PCN Tracking # : 3501
Issue Date: 4/29/16	Effective Date: 6/13/16
Type of Change: A part marking, packing and labeling change to all Cambridge Silicon Radio (CSR) products.	
Description of Change: Part Marking Change <ul style="list-style-type: none"> • Add an additional character to the Date Trace Code value marked on CSR products. Currently, the format is AYWWXX. New format will be AYWWXXX. • The ship lot # format will change from CSR format to Qualcomm format. Packing and labeling for CSR products recently acquired by Qualcomm will be updated to conform to Qualcomm's standard packing and labeling. This will affect: <ul style="list-style-type: none"> • Inner cartons and shipping cartons • All barcode labels • Moisture Caution Label • Lot number (can be up to a max of 30 characters) 	
Reason for Change: To enable clean traceability for CSR products when their business system is integrated into Qualcomm's business system. As a part of the integration of CSR products into Qualcomm Technologies we are updating the packing and labeling methods to meet our internal standards.	
Affected Product List: All CSR products	
Data to Justify Change: N/A	
Suggested Implementation Plan: Customers may receive both current and new packing and labeling on shipments as we transition our inventory and suppliers inventory from the old packing and labeling method to the new.	

PCN Tracking # : 3501	
Issue Date: 4/29/16	Effective Date: 6/13/16
<p>Marking will be effective for new assembly lots started after work week WW31, 2016.</p> <p>Ship lot # change will transition over the next several months.</p>	
<p>Impact on Form, Fit & Function: Part marking will be different Change to packing materials and labeling.</p>	
<p>Impact on Software: N/A</p>	
<p>Affected Product documentation: Packing and labeling standards are outlined in: 80-VK055-1: IC Products Packing Method (see below inclusion)</p>	
<p>New Parts will be Identified by: The date code and the longer Date Trace Code marked on the devices. Different packing and labeling</p>	





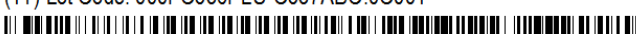
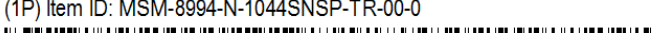
Changed material may be shipped as of the effective date specified above.
 For questions and information, please contact customer service at your branch office.
 For questions after the effective date of this PCN, please reference product documentation for latest updates or requirements at <https://support.cdmatech.com/login/>

Product labels







Current CSR label:

(1P) MPN: XXXXXXXXXX 		COO : TW MS Level : 3 Hours : 168 Hours Sealed: 07 May 13 Carriers T Bake : <= 40 °C
(P) Customer Part No.: ZZZZZZZZ 	(T) Trace Code : HABAB 	
(1T) LOT#: XXXXXXXX,YYYYYYYY 	(Q) QTY: QQQQ 	
(9D) DTE: SYWWXX,SYWWXX 		

New T&R Label (example)

QUALCOMM 	(1J) LPN: UN144356508SSY00AAA 	(Q) Quantity: 1000 	(9D) D/C: 15361537B 
	(1T) Lot Code: 000FC536PLU-C537ABC.0C001 		MSL: 3 2nd L.I.: (e1)
	(1P) Item ID: MSM-8994-N-1044SNSP-TR-00-0 		Sealed: 16-SEP-2015
			Assembled in: S. Korea

New Tray Label (example)

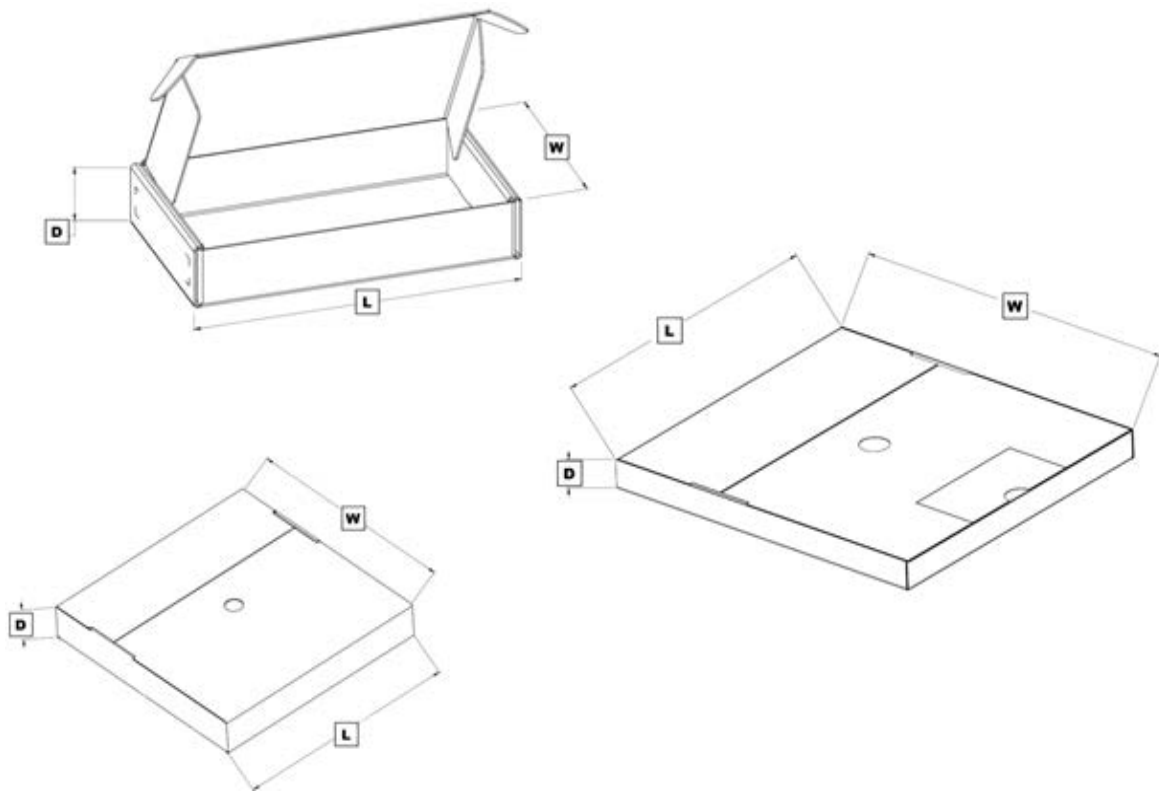
QUALCOMM		
(1J) LPN: UN144356508SSY00AAA 		
(9D) D/C: 15361537B 	(Q) Quantity: 1000 	
(1T) Lot Code: 000FC536PLU-C537ABC.0C001 		
(1P) Item ID: MSM-8994-N-1044SNSP-TR-00-0 		MSL: 3 2nd L.I.: (e1) Sealed: 16-SEP-2015 Assembled in: S. Korea

Product cartons

The sealed MBB is placed inside an intermediate carton. A barcode label is placed on the external surface of the intermediate carton. The carton may also include additional labels.

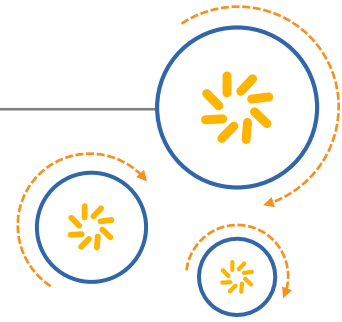
Table 0-1 Intermediate carton nominal external dimensions (mm)

Carrier	Configuration	L	W	D
JEDEC Trays	5+1 tray stack	374	170	62
	10+1 tray stack	374	170	104
330 mm reels	8 ~ 24 mm width	359	343	36
	32~44 mm width	359	343	58
178 mm reels	8 ~ 16 mm width	200	200	36





Qualcomm Technologies, Inc.



IC Products Packing Method

80-VK055-1 Rev. H

April 6, 2016

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Revision history

Revision	Date	Description
A	August 2008	Initial release
B	September 2008	<ul style="list-style-type: none"> ▪ Section 2.1.1.1: Changed intermediate barcode label from pure 2D barcode to hybrid 1D/2D barcode. Changed label size from 102 × 25 mm to 152 × 25 mm.
C	March 2009	<ul style="list-style-type: none"> ▪ Added new definition for Data Matrix symbol in Table 5-1.
D	November 2009	<ul style="list-style-type: none"> ▪ Add cobalt (II) chloride-free HIC and revised moisture caution label.
E	November 2012	<ul style="list-style-type: none"> ▪ Update overall document content
F	June 2013	<ul style="list-style-type: none"> ▪ Added matrix tray carrier label (see QCT PCN 2779 and QCA PCN 0082)
G	May 2014	<ul style="list-style-type: none"> ▪ Update label figures to reflect the most recent updates
H	April 2016	<ul style="list-style-type: none"> ▪ Updated MSD caution label and barcode label formats

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1 Overview

1.1 Purpose

The purpose of this document is to describe the materials and methods used in the packing and labeling of Qualcomm integrated circuit (IC) products shipped in tape and reel or matrix tray carrier systems.

1.2 Scope

This document applies to IC products provided by Qualcomm Technologies, Inc. (“QTI”)

1.3 Reference documents

Table 1-1 Applicable documents

Document title	Organization	Number
8mm ~ 200mm Embossed Carrier Taping of Surface Mount Components for Automatic Handling	ANSI (www.ansi.org)	ANSI/EIA-481
JEDEC design standard: Design guide for generic matrix trays	JEDEC (www.jedec.org)	JEP95 (§4.10)
Moisture/Reflow Sensitivity Classification for Non-hermetic Solid State Surface Mount Devices	JEDEC (www.jedec.org)	J-STD-020
Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices	JEDEC (www.jedec.org)	J-STD-033
Desiccants, Activated, Bagged, Packing use and static dehumidification	U.S. DoD (www.dsccl.dla.mil)	MIL-D-3464

2 Package Carriers

2.1 Tape and Reel system

Tape and reel (“T&R”) is the primary carrier for Qualcomm products. All T&R systems used to deliver Qualcomm products are compliant to industry standard EIA-481.

Information about the T&R system for products designated to be delivered in this type of carrier can be found in that product’s device specification. The device specification provides the following information:

- Device orientation in tape
- Tape width and pitch
- Reel and hub diameter
- Devices per reel

2.2 Matrix tray carriers

Matrix tray carriers are used in some cases to transport Qualcomm products. Large and heavy packages that are not suitable for T&R are shipped in matrix tray format, though use of this type of carrier is not limited to these types of packages. All matrix tray carriers used to transport Qualcomm devices comply with JEDEC standards.

For production shipments, Matrix trays are provided in either 5+1 tray stacks (5 trays with devices plus one tray to act as a lid) or 10+1 tray stacks. Samples delivered during new product introduction may deviate from this standard configuration.

The device is oriented in the tray such that its Pin1 faces the 45 degree chamfer on the corner of the tray.

Information about the matrix tray carrier for products designated to be delivered in this type of carrier can be found in that product’s device specification. The device specification provides the following information:

- M-values: cell offsets and pitch
- N-values: matrix count (number of rows and columns) and devices per tray
- Stack configuration (5+1 or 10+1)
- Standard pack quantity

3 Dry Packing

3.1 Moisture Sensitivity Level (MSL)

Qualcomm devices are classified into moisture sensitivity levels (“MSL”) in accordance with IPC/JEDEC J-STD-020.

- Devices which qualify as MSL 1 are deemed not moisture sensitive
- All other devices MSL 2 through MSL 6 are deemed to be moisture sensitive.
- Moisture sensitive devices are dry baked and dry packed in accordance with IPC/JEDEC J-STD-033

3.2 Dry baking

Prior to dry packing, all moisture sensitive devices are baked to ensure all moisture is removed.

After baking, moisture sensitive devices are typically dry packed and sealed within 4 ~ 8 hours. All baked devices are sealed within the IPC/JEDEC J-STD-033 mandated 24 our maximum manufacturer’s exposure time (“MET”).

3.3 Dry packing

All moisture sensitive devices must be dry packed. Dry packing entails sealing the device carrier (T&R or Matrix trays) inside a moisture barrier bag with an appropriate amount of desiccant. A humidity indicator card (HIC) is included in the dry pack to provide a method to verify the integrity and effectiveness of the dry pack when the MBB is opened.

3.3.1 Moisture Barrier Bag (MBB)

The MBB is durable, ESD-safe, and allows minimal moisture transmission. It is vacuum-sealed at the factory and should be handled carefully to avoid puncturing or tearing. The MBB protects the enclosed devices from moisture exposure; it should not be opened until the devices are ready for input to SMT operations.

Qualcomm approves for use only those MBB which meet all permeability, durability, and ESD characteristics requirements. Permeability (water vapor transmission rate) is a key attribute of an MBB and is a primary factor in determining calculated shelf life (see 3.4)

Excess air is typically removed from the MBB prior to heat sealing by use of vacuum evacuation or by hand. Only as much excess air is removed as is necessary to reduce bulk to ensure a proper fit in the carton. It is neither necessary nor desired to remove all excess air – doing so impedes the function of the desiccant, can deform the carrier, and reduces the puncture resistance of the MBB.

3.3.2 Desiccant

Each MBB contains one or more desiccant pouches to absorb moisture that may permeate the MBB while the product is in storage. Each unit of desiccant has a fixed capacity for moisture absorption; the total mass and desiccating capacity of the desiccant are primary factors in determining calculated shelf life (see 3.4)

Qualcomm uses dustless and non-corrosive desiccant which meets all MIL-D-3464 Type II requirements. The desiccating material is Bentonite clay. The desiccant pouch is designated as Tyvek, X-Crepe, GDT-1, GDT-2, or other similar spunbonded olefin.

3.3.3 Humidity Indicator Card (HIC)

The humidity indicator card (HIC) should be used as the primary method to determine whether the enclosed devices have been exposed to excessive moisture inside the MBB. The HIC is a moisture indicator and is included to show the approximate relative humidity level within the bag.

To determine the actual condition of dry packed devices one must immediately inspect the condition of the humidity indicate card (HIC) upon opening a sealed MBB. If the HIC indicates moisture exposure exceeding the permitted threshold for the device’s MSL, then it must be assumed that the devices have been exposed to an unacceptable level of moisture and should be dry baked prior to SMT – irrespective of the calculated shelf life (3.4) and the amount of time that has passed from the original baking and dry packing. Qualcomm does not recommend baking devices in tape and reel.

NOTE: All Qualcomm HIC are CoCl₂-free.

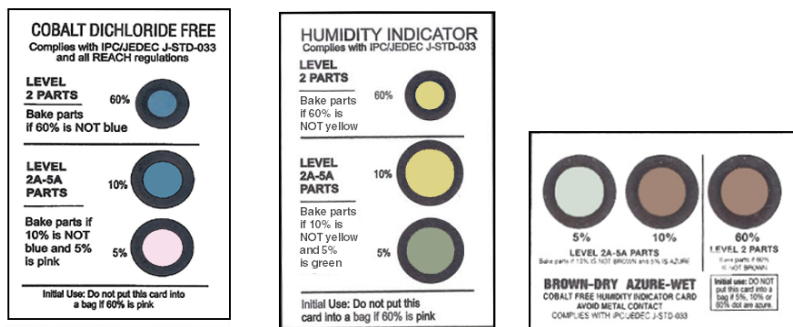


Figure 3-1 Examples of CoCl₂-free HIC

The HIC should be read as follows:

- Level 2 parts: If the 60% button indicates exposure, the components have exceeded the limit for moisture exposure and must be rebaked.
- Level 2A – 5A parts: If the 10% button indicates exposure and the 5% button is fully exposed, the components have exceeded the limit for moisture exposure and must be rebaked.

NOTE: Please carefully read the printed instructions provided on the HIC by the HIC manufacturer for guidance on the initial (dry) color and its indicative (moist) color.

3.4 Calculated shelf life

The calculated shelf life is the expected (calculated) duration in months that dry devices packed in a moisture barrier bag (MBB) with desiccant are expected to remain dry (exposed to <10% RH). The calculated shelf life is a function of the permeability of the MBB, the total available capacity of the desiccant, and the total surface area of the MBB (see Figure 3-2). If the MBB is punctured or otherwise damaged in a way that compromises its integrity, the calculate shelf life is no longer valid.

$$\text{Shelf Life} = \left(\frac{G}{30.4 \times V \times A} \right) \text{ months}$$

G	Total desiccant capacity in grams of H ₂ O
A	Total exposed surface area of the MBB
V	Daily H ₂ O(g) transmission rate of the MBB in grams per unit area

Figure 3-2 Expected shelf life calculation

The calculate shelf life is an estimation based on the specified properties of the related dry pack materials. There are other unforeseen factors that may decrease or extend the actual shelf life of the dry packed devices relative to the calculated estimate. To determine the actual condition of dry packed devices one must immediately inspect the condition of the humidity indicator card (HIC) upon opening a sealed MBB (see 3.3.3).

The minimum calculated shelf life for Qualcomm products is 30 months.

3.5 Moisture caution label

The moisture caution label (Figure 3-3) outlines precautions that must be taken with dry-packed moisture sensitive products, including the shelf life and baking requirements. This caution information may be printed directly onto the MBB or it may be attached as a separate label.

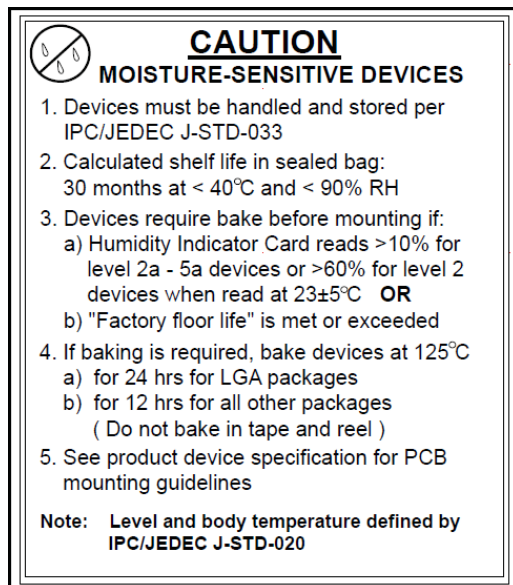


Figure 3-3 Moisture caution label

4 Barcode labels

For tape and reel systems, this label is attached to the product packing in three places: reel, moisture barrier bag (MBB), and intermediate box. For matrix tray systems, this label is only applied to the MBB and intermediate box.

Table 4-1 Field definitions for 2D + 1D T&R barcode label



Item		Description
A	2D barcode	Contains a comma delimited list of the barcoded items on the label with data identifiers. The 2D barcode may also contain additional information used by Qualcomm internally
B	(1J) LPN	A unique serial number for the product carrier and transportation unit
C	(1T) Lot Code	Lot number
D	(1P) Item ID	Catalog item part number
E	(Q) Quantity	Intermediate container quantity
F	(9D) Date Code	Assembly date code (YYWWYYWW α format) See Figure 4-1
G	MSL	Moisture sensitivity level (reference IPC/JEDEC J-STD-020)
H	2 nd L.I.	Second-level interconnect composition (reference IPC/JEDEC J-STD-609).
J	Sealed date	The date that the MBB was sealed (see 3.4)
K	Assembled in	Country of package assembly

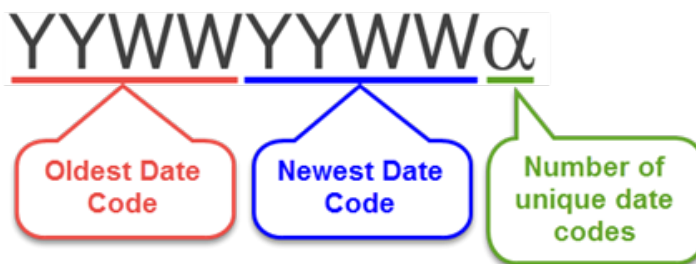
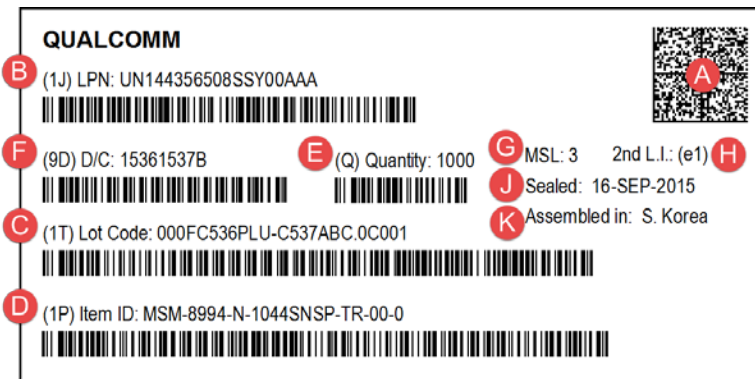


Figure 4-1 Date Code format (YYWWYYWW α)

Table 4-2 Field definitions for 2D + 1D matrix tray barcode label



Item		Description
A	2D barcode	Contains a comma delimited list of the barcoded items on the label with data identifiers. The 2D barcode may also contain additional information used by Qualcomm internally
B	(1J) LPN	A unique serial number for the product carrier and transportation unit
C	(1T) Lot Code	Lot number
D	(1P) Item ID	Catalog item part number
E	(Q) Quantity	Intermediate container quantity
F	(9D) Date Code	Assembly date code (YYWWYYWW α format) See Figure 4-1
G	MSL	Moisture sensitivity level (reference IPC/JEDEC J-STD-020).
H	2 nd L.I.	Second-level interconnect composition (reference IPC/JEDEC J-STD-609).
J	Sealed date	The date that the MBB was sealed (see 3.4)
K	Assembled in	Country of package assembly

5 Product cartons

The sealed MBB is placed inside an intermediate carton. A barcode label is placed on the external surface of the intermediate carton. The carton may also include additional labels.

Table 5-1 Intermediate carton nominal external dimensions (mm)

Carrier	Configuration	L	W	D
JEDEC Trays	5+1 tray stack	374	170	62
	10+1 tray stack	374	170	104
330 mm reels	8 ~ 24 mm width	359	343	36
	32 ~ 44 mm width	359	343	58
178 mm reels	8 ~ 16 mm width	200	200	36

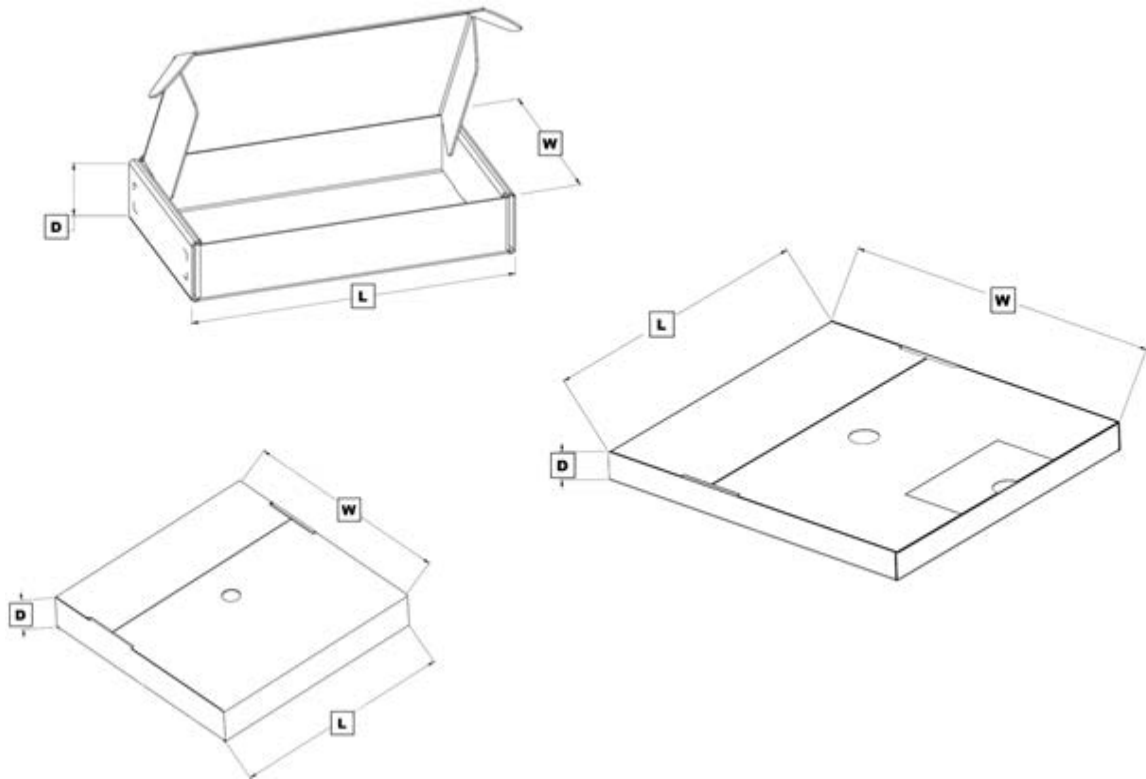


Figure 5-1 Intermediate carton illustrations