IGBT

Failure chips on Wafers and e-wafer map

Introduction

This document describes the specifications of mapping data for failure chips on Renesas IGBT wafer products include sawn wafer products.

Target Device

IGBT wafer products

Contents

1. About the mapping data of failure area for wafer products

Renesas provides failure area information for wafer products by using the electronic data called “E-wafer map”.

1.1 Providing flow of E-wafer map

Providing flow of E-wafer map from a wafer production flow is shown below.

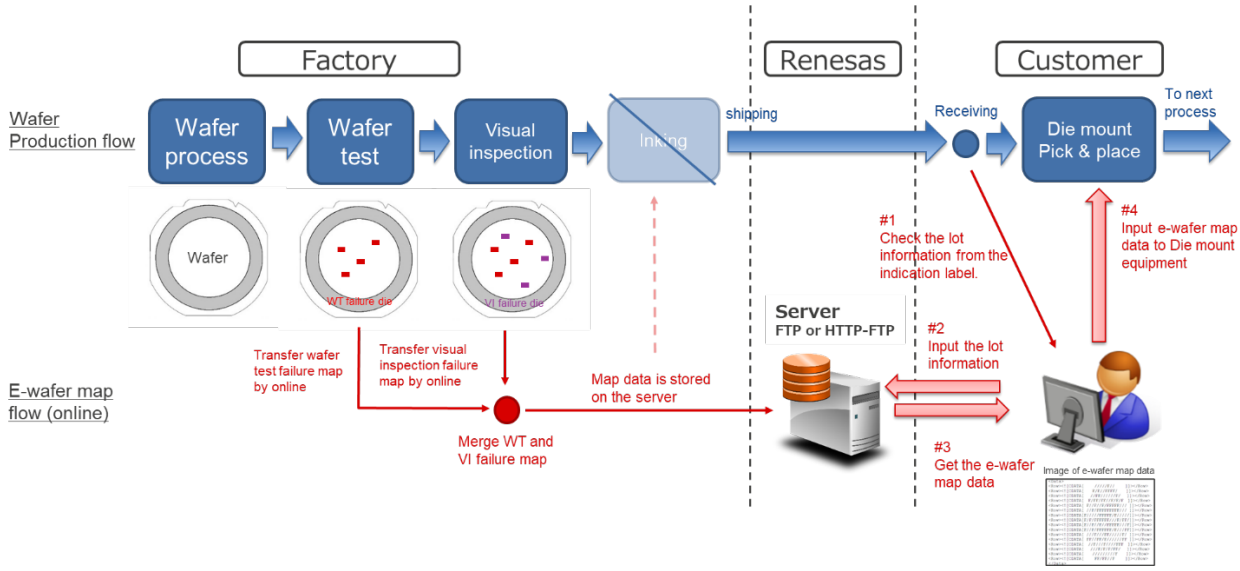

Figure 1-1 Providing flow of E-wafer map

1.2 e-wafer map format

The specification for e-wafer map format is shown below.

1.2.1 Specification for e-wafer map format

Table 1 e-wafer map format

items	Contents	Note.
File format	XML format	
Data format	SEMI standard compliant Version : SEMI G85-0303	See an example on the next page
File unit	One file for one wafer	E-map files is compressed for each lot and stored on the FTP server.
File name	**(Wafer ID).xml** **→ex1. DQ6393 10.xml** Lot No. space Wafer No. **ex2. DQ6393@10.xml**	The "wafer ID" in the file name matches the reading on the barcode label attached to the wafer.

1.2.2 Example for e-wafer map data

XML data for e-wafer map is shown below.

```
<?xml version="1.0" ?>
<Map
 xmlns="http://www.semi.org"
 WaferId="EQJ123_08"                    ← Wafer ID
 FormatRevision="SEMIG45-0301">
<Device
 ProductId="RBN220N75A5JWS-000"
 LotId="EQJ333"                         ← Lot No.
 SubstrateNumber="8"                    ← Wafer No.
 SlotNumber="8"
 Orientation="0"
 DeviceSizeX="8600"                     ← Chip size [um]
 DeviceSizeY="9000"
 Rows="30"                              ← Number of lines in the map area
 Columns="32"                           ← Number of columns in the map area
 BinType="ASCII"
 FrameId=""
 NullBin=" "
 SupplierName="Renesas"
 MapType="Array"
 HeadingDeviceX="94"                    ← Origin coordinates in the map area
 HeadingDeviceY="73"
 DeviceRow="30"
 OriginLocation="2"
 WaferSize="300"
 CreateDate="2023102000000000"
 Status="PS">
<ReferenceDevice
 ReferenceDeviceX="100"
 ReferenceDeviceY="100"
/>
<Bin BinCode="1" BinQuality="Pass" BinDescription="Grade1" BinCount="724" />   ← Number of Pass
<Bin BinCode="0" BinQuality="Fail" BinDescription="" BinCount="38" />          ← Number of Fail
<Bin BinCode="." BinQuality="Null" BinDescription="Null" BinCount="198" />
<Data>
<Row><![CDATA[..........11111111111..........]]></Row>   ← Map data
<Row><![CDATA[........1111111111111111........]]></Row>
<Row><![CDATA[.......111111111111111111.......]]></Row>
<Row><![CDATA[.....11111111111111111111.....]]></Row>
<Row><![CDATA[....1111111111111111111111....]]></Row>
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<Row><![CDATA[.......1111111111111111.......]]></Row>
<Row><![CDATA[.........11111111111.........]]></Row>
<Row><![CDATA[...........1111111...........]]></Row>
</Data>
</Device>
</Map>
```

Category:

"1" means Pass.

"0" means Fail.

"." means blank.

Figure 1-2 Example for e-wafer map data

1.2.3 Example of coordinates for e-Wafer map data

Example of coordinates for e-Wafer map data is shown below.

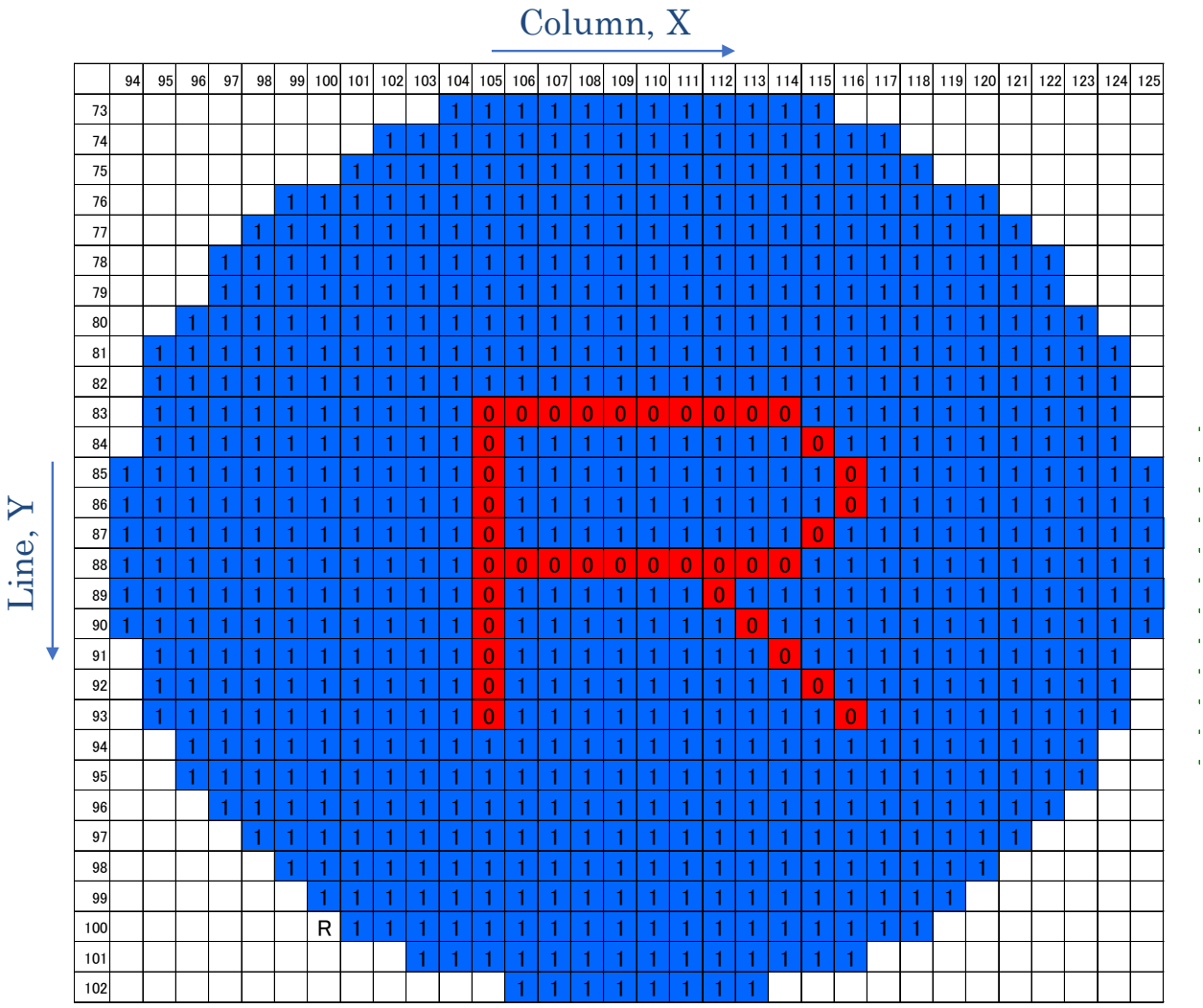

Figure 1-3 Example of coordinates for e-Wafer map data*1

*1: This diagram shows some failure chips on a wafer to explain failure area simply. So those failure chips are not concerned with the actual failure rate and failure area.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jul.31.24	-	First edition

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